

Tungs' Medical Journal

CONTENTS IN BRIEF

EDITORIAL

- 49 **Interprofessional Education in Holistic Patient Care**
Ching-Shiang Chi

REVIEW ARTICLE

- 54 **Potential Application of Apple Polyphenol in Inflammation**
Huei-Jane Lee

ORIGINAL ARTICLE

- 59 **Dementia, Mild Cognitive Impairment, and Depression among Hospitalized Veterans: a Prospective Study of their Prevalence and Risk Factors**
Chi-Chiang Yang, Kee-Ching Jeng, Shwu-Tzy Wu, Yi-Chun Lin, Liang-Jen Chuo
- 65 **Comparison of Two Educational Methods for Educating Primary Caregivers about Urinary Catheter Care in Homecare Patients**
Fang-Chih Jao, Shu-Ting Chuang, Jeng-Yuan Chiou, Lih-Ying Lin, Kee-Ching Jeng, Chien Hung Kuo

CASE REPORT

- 74 **Spontaneous Interstitial Pregnancy after Ipsilateral Laparoscopic Total Salpingectomy: A case report and literature review**
Wen-Sheng Wang, Tian-Yung Wei, Heng-Feng Kao
- 79 **Complete Obstruction of the Femoral Artery in Pubic-type Traumatic Anterior Hip Dislocation: a case report**
Chen-Shun Huang, Shao-Keh Hsu, Hsueh-Ming Chen
- 84 **Successful Non-surgical Management of Small Bowel Perforation Caused by Fish Bone Ingestion: A case report**
Mao-Yu Huang, Yen-Lin Chen, Po-Jen Hsaio, Yoiu-Wen Cheng
- 90 **Spontaneous Bladder Rupture of a Female Patient: A Case Report**
Siu-San Tse, Wei-Chun Weng, Min-Che Tung
- 95 **Adrenal Cushing's Syndrome with a High Vanillylmandelic Acid Level: A Case Report and Literature Review**
Chang-Ci Chen, Cheng-Lin Tsai, Chien-Jung Chang, Ji-Kuen Yu
- 100 **Cryptococcal Meningitis Presenting as Transient Aphasia**
Cheng-Lun Hsiao, Shinn-Kuang Lin

Editorial

Interprofessional Education in Holistic Patient Care

Ching-Shiang Chi*

Tungs' Taichung Metroharbor Hospital

Received: Dec. 25, 2014; Accepted: Dec. 26, 2014

Abstract

Holistic patient care or total patient care is a healthcare approach that includes the physical, psychological, economic, and social needs of a patient. A patient's medical care provider involves different medical fields of specialists. Therefore, interprofessional holistic patient care is important for patient's health care. This article shows that the protocol for interprofessional medical education development of holistic patient care have been implemented in Tungs' Taichung MetroHarbor hospital.

Key words: Holistic patient care education, Interprofessional education

Patient safety is always the priority goal of healthcare worldwide. Because of the advanced network technology, adequate updated medical knowledge, and healthcare technology information are available for everyone via the Internet. In addition, as the society increasingly respects individual values, a patient's healthcare plan is involved more patient's and his/her family's aspects more than ever before. A patient's medical care provider has gradually shifted from an individual specialist to a collaborative medical team that involves different specialists of different medical fields^[1]. As a result, Interprofessional holistic patient care has been the policy pursued by National Health Insurance Administration Ministry of Health and Welfare in 2009. The purpose of the policy is to meet the needs of medical treatment for patients and their families.

Implementing holistic patient care not only improves the quality of healthcare and patient safety but can also establish a culture of safety in a healthcare organization. Safety culture contains the attitudes held within a working environment, from the leadership to each member in the workplace. Culture does not change overnight^[2], but it does

respond to effective interventions. Those interventions consider several tools such as creating patient safety program, which includes a meeting protocol of holistic patient care and a good communication system. The leaders of an organization must create an honest discussion and blame-free culture. Moreover, an organization needs to provide training opportunities for employees to increase their belief, conscious, and capacity of safety culture. Other techniques for employees involving medical survey and data analysis are essential components in the training program, too.

Nowadays the role of interprofessional development becomes more and more important in healthcare education^[3,4]. This article shows how the interprofessional developments of holistic patient care and safety culture have been implemented in Tungs' Taichung MetroHarbor hospital. A safety culture enhancement education program has been launched in 2011, and in focuses on the four essential elements, assessing healthcare safety culture within the hospital, incorporating a culture of safety into holistic patient care training program, implementing holistic patient care protocol which safety culture is embedded, and creating an information network platform. A survey (pre-assessment) has been given to holistic patient care training participants for assessing the level of safety culture in various

*Correspondence to: Ching-Shiang Chi, Tungs' Taichung Metroharbor Hospital, No. 699, Sec. 8, Taiwan Blvd., Wuqi Dist., Taichung City, 435, Taiwan (R.O.C.)

domains in Tung's hospital before the training. It includes the prior knowledge about teamwork, patient involvement in his/her own treatment, openness or transparency of discussion among colleagues, and accountability of each member in the hospital. Then the supervisors of holistic patient care training program identified all key knowledge, skills and attitude that participants need to perform high quality patient care; and integrated the knowledge of total patient care and safety culture to create a training curriculum. Holistic patient care is an approach that a patient is taken care of by a cooperative multidisciplinary team. Therefore, an effective communication skill and a rapid yet and well-structured communication system should also be emphasized in the program. The curriculum of training program also involves the other concepts and skills, such as team resource management, interprofessional team, KAS, IPE, IPL, TeamSTEPPS^[5], etc. The earliest Interprofessional Education workshop in Tung's hospital started in 2011. It was a "train the trainer" workshop for the faculty. The next year, hospital wide holistic patient care workshops took place and were facilitated by the trainers who completed the Interprofessional Education workshops.

In order to maintain the quality of patient care, a Holistic Patient Care Protocol has been created by us (Fig. 1). It includes pre-conference, conference, and post-conference. In pre-conference, the medical team discusses the agenda for the conference, analyzes patients' situation, and designs recommended treatment plans for the patients. In the conference, patients and families are in the center of the care process. Each team member is responsible for offering medical information regarding patients' diagnosis and treatment. Patients and families are fully involved in making decisions about treatment.

The medical team will meet again in the post-conference to do a reflection on the teamwork and revise the treatment plan. The entire protocol also serves as an important part of the holistic patient care training program. The program participants will observe how the medical team members interact and discuss with patients, families, and other team members. They also shadow the team through a completed protocol cycle. Feedback forms are given to participants to complete after their observation. We enhance future working together in terms of learning together.

Holistic patient care (total patient care) is an approach to handle patients as a "whole" by a collaborative medical team^[6,7]. Safety culture is a vital foundation for the success of implementing holistic patient care in a hospital. A high level culture of safety will reduce risk of damage to patients and providers through both system effectiveness and individual performance. In order to develop a culture of safety and consolidate the knowledge and skills of holistic patient care, an informative, well-designed, and practical training program is needed to serve as a vehicle to lead the movements. Tung's hospital created a protocol to support the implementation of holistic patient care and to align it to the part of training program. I believe that by supporting the Holistic Patient Care Policy of National Health Insurance Administration Ministry of Health and Welfare, safety culture will increase in hospitals. As a result, both patients and hospitals will benefit from the policy and the movement.

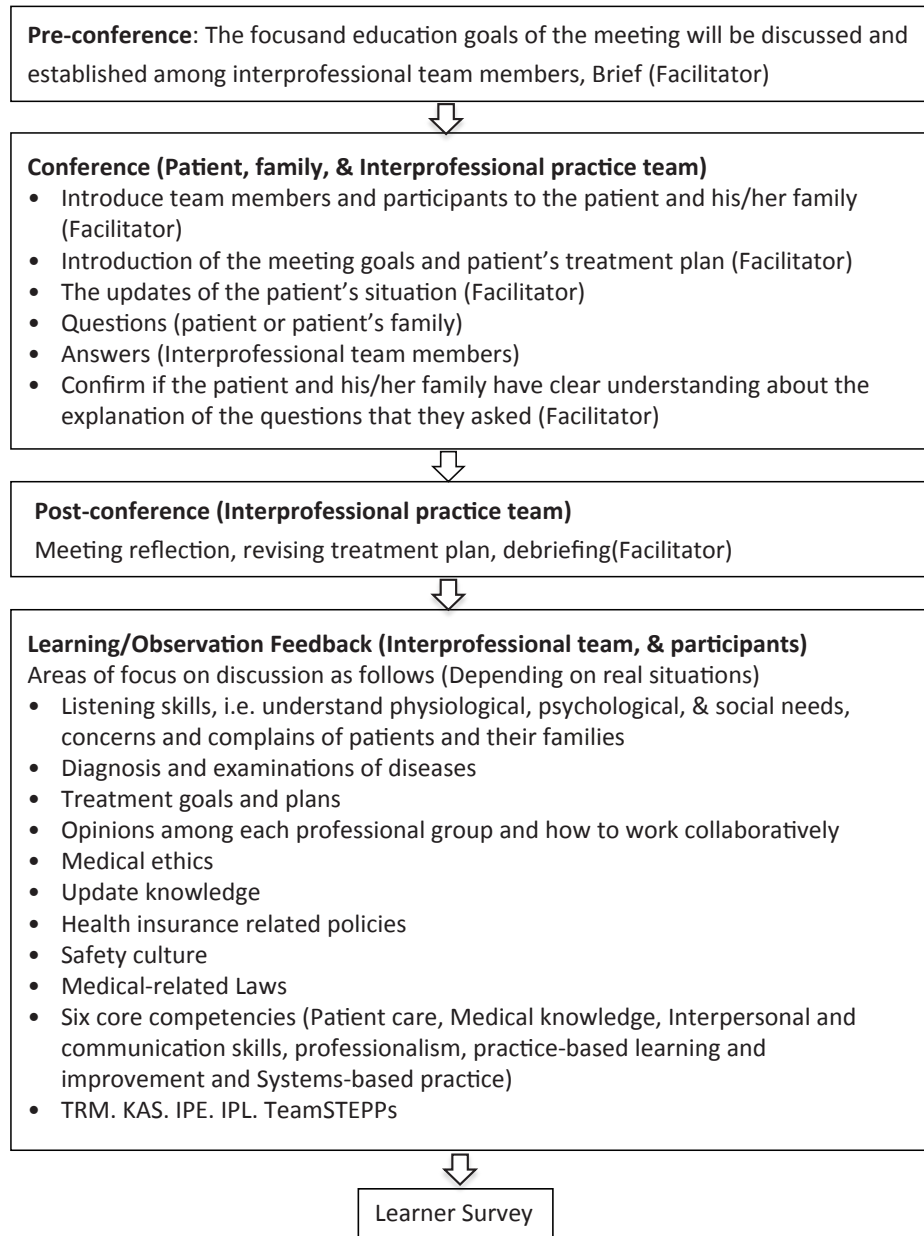


Fig. 1 Protocol of holistic patient care and interprofessional education and learning. IPE: interprofessional education; IPL: interprofessional learning; KAS: knowledge, attitudes, and skills; TeamSTEPPS: strategies and tools to enhance performance and patient safety; TRM: team resource management.

Terms and Definition

Culture: The way we do things around.

Team: It is defined as a group (two or more) of people with different skills and different tasks, who work together on a common goal.

Interprofessional: It is a group of individuals from different disciplines working and communicating

with each other individuals.

TRM (Team Resource Management): TRM is a philosophy which helps us realize that we humans are error prone; a philosophy which will help us put in place more and better safety nets; a philosophy which helps each of us play a better and more constructive part in our team.

KAS: Knowledge, Attitudes, and Skills

IPE (Interprofessional Education): Occasions when two or more professions learn from, with and about each other to improve collaboration and the quality of care.

IPL (Interprofessional Learning): Learning is arising from interaction between members (or students) of two or more professions. This may be a product of interprofessional education or happen spontaneously in the workplace or education settings. TeamSTEPPS (Strategies and Tools to Enhance Performance and Patient Safety): TeamSTEPPS is an evidence-based teamwork system aimed at optimizing patient outcomes by improving communication and teamwork skills among health care professionals.

References

1. Thistlethwaite J, Dallest K. Interprofessional teamwork: still haven't decided what we are educating for? *Med Educ* 2014; 48: 552-60.
2. Clark PG. What would a theory of interprofessional education look like? Some suggestions for developing a theoretical framework for teamwork training. *J Interprof Care* 2006; 20: 577-89.
3. Thistlethwaite J. Interprofessional education: a review of context, learning and the research agenda. *Med Educ* 2012; 46: 58-70.
4. Thistlethwaite J, Moran M, Practice C. Learning outcomes for interprofessional education (IPE): Literature review and synthesis. *J Interprof Care* 2010; 24: 503-13.
5. Gittel JH, Beswick J, Goldmann D, Wallack SS. Teamwork methods for accountable care: Relational coordination and TeamSTEPPS. *Health Care Manage Rev* 2014; DOI: 10.1097/HMR.000000000000021.
6. Baldacchino DR. Nursing competencies for spiritual care. *J Clin Nursing* 2006; 15: 885-96.
7. Pullon S, Fry B. Interprofessional postgraduate education in primary health care: Is it making a difference? *J Interprof Care* 2005; 19: 569-78.

專業間之全人醫療教學

遲景上*

童綜合醫院

受文日期：民國 103 年 12 月 25 日；接受刊載：民國 103 年 12 月 26 日

摘要

全人醫療 (Holistic Patient Care or Total Patient Care)，是一種醫療照護模式，在此模式中病患及家屬的醫療照護是經由一組跨領域之專業醫療服務提供者負責。醫療團隊不但要針對病症進行治療，並且要依病患個別生活模式、心理狀態及各種現實生活需求量身訂製一套專屬醫療計畫，病患本身及家屬的意見更是其醫療計畫的重要考量。因此，醫療服務團隊會面對病患及家屬之情境下的醫療相關議題，所以專業間需要教育訓練，使得專業之間藉助共同學習，增強共同工作之安全文化，本篇文章主要是介紹童綜合醫院推展全人醫療照護的模式及其相關的醫學教育訓練。

關鍵詞：全人醫療教學、專業間教學

Review Article

Potential Application of Apple Polyphenol in Inflammation

Huei-Jane Lee^{1,2,*}¹Department of Biochemistry, School of Medicine, Chung Shan Medical University, Taichung, Taiwan²Institute of Biochemistry and Biotechnology, Chung Shan Medical University, Taichung, Taiwan

Received: Dec. 24, 2014; Accepted: Dec. 25, 2014

Abstract

Polyphenol is abundance in apple (Rosaceae *Malus* sp.), and it is reported to possess health benefits. Some *in vitro* and *in vivo* studies showed the functional components have the effects in anti-oxidation and anti-inflammation. Herein, some previous researches are reviewed to describe the potential application of apple polyphenols in decelerating inflammatory disease. It is also implied the health benefit of apple would be partially due to the apple polyphenols possessing anti-oxidation and anti-inflammation.

Key words: Holistic patient care education, Interprofessional education

Apple polyphenol, AP

Plant-derived polyphenols is associated with reducing incidence of coronary heart disease and some cancers^[1]. It is suggests these bioactive benefits can be attributed to antioxidant and anti-inflammatory properties^[2-6]. Oxidative stress is the important factor in the pathogenesis of many diseases, and the antioxidant activity of polyphenols on free radicals and reactive oxygen species (ROS) is proven^[7,8]. Some of the mechanisms are pointed to be due to modulating endogenous cell signaling pathways^[9,10]. Polyphenols were also involved to influence immune response via regulating mediators or cellular events to modulate inflammation^[11,12]. After digestion, some compounds can transform to metabolic product, and they can have a profound effect on their antioxidant and anti-inflammatory properties^[13]. Apple (Rosaceae *Malus* sp.) is documented to possess nutritional and health benefits^[14,15]. There are some major classes of polyphenols in apple including phenolic acids, anthocyanins, flavan-3-ols

(e.g. catechin), dihydrochalcones (e.g. phloridzin), and flavonols (e.g. quercetin)^[16] (Table 1). The *in vitro* antioxidant properties of flavonoids in apple were mentioned^[17]. Conducted to the previous studies, the health benefit of apple would be partially due to the apple polyphenols (AP) possessing anti-oxidation and anti-inflammation. In addition to anti-oxidation, AP and other apple extracts were found several biological activities, such as anti-allergy, anti-tumor, hair growth-promotion, and obesity prevention^[18-21]. The functional compounds have been also reported to be effective for reducing cardiovascular risk factors, such as anti-hypertensive effects, inhibition of platelet aggregation, increasing endothelial-dependent vasodilation, and hypocholesterolemic effect. It is suggested that polyphenols may contribute to the cardioprotective properties of fruits^[22].

AP in inflammation

Previous researchers demonstrated the benefit of apple peel polyphenols on oxidative stress and inflammation in inflammatory bowel diseases^[23]. They showed the antioxidant and anti-inflammatory abilities of apple peel polyphenols would be via preventing lipopolysaccharide-induced inflammation

*Correspondence to: Huei-Jane Lee, PhD, Institute of Biochemistry and Biotechnology, Chung Shan Medical University 110, Sec. 1, Jianguo N. Road, Taichung, 402, Taiwan (R.O.C.)

Table 1. Composition of apple polyphenols. ^a

Procyanidins	Apple polyphenols (wt %) ^b
Procyanidin (dimers)	11.1%
Procyanidin (trimers)	12.3%
Procyanidin (tetramers)	8.7%
Procyanidin (pentamers)	5.9%
Procyanidin (hexamers)	4.9%
Procyanidin (other polymers)	20.9%
Flavan-3-ols (monomers)	12.4%
Other flavonoids	6.5%
Non-flavonoids	10.8%

^a The Table is obtained from Lee et al. (Ref. 36)

^b The data is referred to Lister et al. (1994) and Mayr et al. (1995)

by altering the expression and activity of endogenous inflammatory proteins. Acetaminophen (AAP) is an analgesic and antipyretic drug but can cause liver injury in high doses^[24]. Bajt *et al.* reports that an oxidant stress precedes cell injury in mice hepatocytes exposed to AAP^[25]. Researchers showed that pretreatment with AP in BABL/c mice can protect the liver from AAP induced damage^[26]. It also showed that pretreatment of AP decreased the level of lipid peroxidation, increased catalase activity, and increased the level of glutathione^[27-29].

Renal fibrosis is the common final pathological hallmark of most progressive renal disease^[30,31]. Unilateral ureteral obstruction (UUO) is a well-documented hydronephrosis model, it can mimic renal fibrosis and show interstitial inflammatory-cell infiltration and tubular dilation, following by tubulointerstitial fibrosis^[32]. UUO can also trigger an apparently consequence of events in the obstructed kidney and leads to reduce renal blood flow and glomerular filtration rate within 24 hours^[33,34]. Then, hydronephrosis, interstitial inflammatory infiltration by macrophages and tubular cell death attributed to apoptosis and necrosis occur. UUO also promotes the renin-angiotensin system which produces reactive oxygen species (ROS) and nuclear factor- κ B (NF- κ B), and then it triggers epithelial-mesenchymal transition (EMT) and makes fibroblasts migrating to the interstitium^[33]. The damaged tubular cells, interstitial macrophages and myofibroblasts produce cytokines and growth factors that induce an inflammatory state in the kidney, promote tubular cell apoptosis and accumulation of extracellular matrix^[35]. In previous study, Lee et al. showed that AP can reduce

the score of tubular dilatation and the score of interstitial volume in UUO rats, and the infiltration of monocytes/macrophages^[36]. MCP-1 is an important mediator of the inflammatory response in the kidney, and abundantly produced by tubular cells in response to renal injury^[37]. In that study, they also found AP decrease the expression of MCP-1. Many studies have shown inhibitory effects of fruit and tea polyphenols on the molecules involved in inflammation, such as nitric oxide (NO), prostanooids, and leukotrienes^[38]. These immunomodulatory and anti-inflammatory properties of the functional compounds would be proposed as contributing mechanisms in preventing certain diseases, including cardiovascular diseases, cancer, neurodegenerative diseases, gastrointestinal disorders, and lung inflammation^[39]. Apple juice extract was documented to significantly inhibit the expression of NF- κ B regulated proinflammatory genes (TNF- α , IL-1, CXCL9, CXCL10), inflammatory relevant enzymes (COX-2, CYP3A4), and transcription factors (STAT1, IRF1) in LPS/IFN- γ stimulated MonoMac6 cells. The main responsible component for anti-inflammation is the flavan-3-ol dimer procyanidin B2. The other components, dihydrochalcone aglycone phloretin and dimeric flavan-3-ol procyanidin B1 were pointed to significantly inhibit proinflammatory gene expression and repressed NF- κ B-, IP-10-, IL-8-promoter-, and STAT1-dependent signal transduction. It would be explained the potential mechanisms in the renal fibrosis.

Conclusion

The functional components existing in AP possess the abilities of not only anti-oxidation but also anti-inflammation. It can afford diseases an alternative protective effect by attenuation of the inflammatory response, and it would be also potential for applying AP to some diseases such as AAP-caused hepatotoxicity, renal fibrosis, and inflammatory intestine diseases.

REFERENCES

1. Kris-Etherton PM, Hecker KD, Bonanome A, Coval SM, Binkoski AE, Hilpert KF, et al. Bioactive Compounds in Foods: Their Role in the Prevention of Cardiovascular Disease and Cancer. *Am J Med* 2002; 113: 71-88.
2. Kundu J, Chun KS, Chae IG, Kundu JK. Phloretin: An Apple Polyphenol with Cancer Chemopreventive Potential. *Arch Bas App Med* 2014; 2: 17-23.

3. Denis MC, Furtos A, Dudonné S, Montoudis A, Garofalo C, Desjardins Y, et al. Apple peel polyphenols and their beneficial actions on oxidative stress and inflammation. *PLoS One* 2013; 8:e53725.
4. Boudjoua S, Oomahb D, Zaidia F, Hosseinian F. Phenolics content and antioxidant and anti-inflammatory activities of legume fractions. *Food Chem* 2013; 138:1543-50.
5. Prior RL, Wu X. Diet antioxidant capacity: relationships to oxidative stress and health. *Am J Biomed Sci* 2013; 5: 126-39.
6. Nieman DC, Gillitt ND, Knab AM, Shanely RA. Influence of a polyphenol-enriched protein powder on exercise-induced inflammation and oxidative stress in athletes: a randomized trial using a Metabolomics Approach. *PLoS One* 2013; 8:e72215.
7. Quiñones M, Miguel M, Alexandre A. Beneficial effects of polyphenols on cardiovascular disease. *Pharmacol Res* 2013; 68: 125-31.
8. Ali F, Ismail A, Kersten S. Molecular mechanisms underlying the potential antiobesity-related diseases effect of cocoa polyphenols. *Mol Nutri Food Res* 2014; 58: 33-48.
9. Hatia S, Septembre-Malaterre A, Le Sage F, Badiou-Bénéteau A, Baret P, Payet B, et al. Evaluation of antioxidant properties of major dietary polyphenols and their protective effect on 3T3-L1 preadipocytes and red blood cells exposed to oxidative stress. *Free Rad Res* 2014; 48: 387-401.
10. Khan HY, Zubair H, Faisal M, Ullah MF, Farhan M, Sarkar FH, et al. Plant polyphenol induced cell death in human cancer cells involves mobilization of intracellular copper ions and reactive oxygen species generation: A mechanism for cancer chemopreventive action. *Mol Nutri Food Res* 2014; 58: 437-46.
11. Cavalcanti E, Vadrucchi E, Delvecchio FR, Addabbo F, Bettini S, Liou R, et al. Administration of reconstituted polyphenol oil bodies efficiently suppresses dendritic cell inflammatory pathways and acute intestinal inflammation. *PLoS One* 2014; 9: doi: 10.1371/journal.pone.0088898
12. Rodríguez-Ramiroa I, Ramosa S, López-Olivaa E, Agis-Torres A, Bravao L, Goyaa L, et al. Cocoa polyphenols prevent inflammation in the colon of azoxymethane-treated rats and in TNF- α -stimulated Caco-2 cells. *Bri J Nutri* 2013; 110: 206-15.
13. Moreno-Jiménez MR, Cervantes-Cardoza V, Gallegos-Infantea JA, González-Laredoa RF, Estrellab I, García-Gascac TJ, et al. Phenolic composition changes of processed common beans: Their antioxidant and anti-inflammatory effects in intestinal cancer cells. *Food Res Int* 2014; doi:10.1016/j.foodres.2014.12.003.
14. Yanagida A, Kanda T, Tanabe M, Matsudaira F, Cordeiro JGO. Inhibitory effects of apple polyphenols and related compounds on cariogenic factors of Mutans Streptococci. *J Agric Food Chem* 2000; 48: 5666-71.
15. Choudhary G, Saini MK, Babbar M, Chaudhary L. Inhibitory effect of apple polyphenols against radiation induced apoptosis by modulation of Bcl-2 and caspase-3 gene expression. *J Cell Tissue Res* 2014; 14: 4551-8.
16. Wang L, Zhang X, Liu Y. The effect of fruit bagging on the color, phenolic compounds and expression of the anthocyanin biosynthetic and regulatory genes on the "Granny Smith" apples. *Eur Food Res Technol* 2013; 237: 875-85.
17. Shoji T, Akazome Y, Kanda T, Ikeda M. The toxicology and safety of apple polyphenol extract. *Food Chem Toxicol* 2004; 42: 959-67.
18. Zhao S, Bomser J, Joseph EL, DiSilvestro RA. Intakes of apples or apple polyphenols decrease plasma values for oxidized low-density lipoprotein/beta₂-glycoprotein I complex. *J Func Food* 2013; 5: 493-7.
19. Takahashi T, Kamimura A, Kagoura M, Toyoda M, Morohashi M. Investigation of the topical application of procyanidin oligomers from apples to identify their potential use as a hair-growing agent. *J Cosm Dermatol* 2005; 4: 245-9.
20. Akiyama H, Sakushima J, Taniuchi S, Kanda T, Yanagida A, Kojima T, et al. Antiallergic effect of apple polyphenols on the allergic model mouse. *Biol Pharma Bull* 2000; 23: 1370-3.
21. Gosse F, Guyot S, Roussi S, Lobstein A, Fischer B, Seiler N, et al. Chemopreventive properties of apple procyanidins on human colon cancer-derived metastatic SW620 cells and in a rat model of colon carcinogenesis. *Carcinogenesis* 2005; 26: 1291-5.
22. Chong MF, Macdonald R, Lovegrove JA. Fruit polyphenols and CVD risk: a review of human intervention studies. *Brit J Nutri* 2010; 104: S28-39.
23. Denis MC, Furtos A, Dudonné S, Montoudis A, Garofalo C, et al. Apple peel polyphenols and their beneficial actions on oxidative stress and inflammation. *PLoS One* 2013; 8: e53725.
24. Olaleye MT, Rocha BTJ. Acetaminophen-induced liver damage in mice: effects of some medicinal plants on the oxidative defense system. *Exp Toxicol Pathol* 2008; 59: 319-27.
25. Bajt ML, Knight TR, Lemasters JJ, Jaeschke H. Acetaminophen-induced oxidant stress and cell injury in cultured mouse hepatocytes: protection by N-acetyl cysteine. *Toxicol Sci* 2004; 80: 343-9.
26. Lee HJ. Apple Polyphenols Decelerate Acetaminophen-Induced Oxidative Stress. *Tung's Med J* 2014; 8: 6-11.
27. Osadebe PO, Okoye FB. Anti-inflammatory effects of crude methanolic extract and fractions of *Alchornea cordifolia* leaves. *J Ethnopharmacol* 2003; 89: 19-24.
28. Picerno P, Autore G, Marzocco S, Meloni M, Sanogo R, Aquino RP. Anti-inflammatory activity of verminoside from *Kigelia africana* and evaluation of cutaneous irritation in cell cultures and reconstituted human epidermis. *J Nat Prod* 2005; 68: 1610-4.
29. Bhattacharjee R, Sil PC. The protein fraction of *Phyllanthus niruri* plays a protective role against acetaminophen induced hepatic disorder via its antioxidant properties. *Phytother Res* 2006; 20: 595-601.
30. Becker GJ, Hewitson TD. The role of tubulointerstitial injury in chronic renal failure. *Cur Opin Nephrol Hyperten* 2000; 9: 133-8.
31. Wu WP, Chang CH, Chiu YT, Ku CL, Wen MC, Shu KH et al. A reduction of unilateral ureteral obstruction-induced renal fibrosis by a therapy combining valsartan with aliskiren. *Am J Physiol Renal Physiol* 2010; 299: F929-41.
32. Wu MJ, Wen MC, Chiu YT, Chiou YY, Shu KH, Tang MJ. Rapamycin attenuates unilateral ureteral obstruction-induced renal fibrosis. *Kidney Int* 2006; 69: 2029-36.
33. Chevalier RL, Forbes MS, Thornhill BA. Ureteral obstruction as a model of renal interstitial fibrosis and obstructive nephropathy. *Kidney Int* 2009; 75: 1145-52.
34. Vaughan ED, Marion D, Poppas DP, Felsen D. Pathophysiology of unilateral ureteral obstruction: studies from Charlottesville to New York. *J Urol* 2004; 172: 2563-9.
35. Grande MT, Pérez-Barriocanal F, López-Novoa JM. Role of

- inflammation in túbulo-interstitial damage associated to obstructive nephropathy. *J Inflamm* 2010; 7: 19.
36. Lee WC, Jao HY, Hsu JD, Lee YR, Wu MJ, Kao YL, Lee HJ. Apple polyphenols reduce inflammation response of the kidneys in unilateral ureteral obstruction rats. *J Funct Food* 2014; 11: 1-11.
 37. Vieira JM, Mantovani E, Rodrigues LT, Dellê H, Noronha IL, Fujihara CK, et al. Simvastatin attenuates renal inflammation, tubular transdifferentiation and interstitial fibrosis in rats with unilateral ureteral obstruction. *Nephrol Dial Transplanta* 2005; 20: 1582-91.
 38. González-Gallego J, García-Mediavilla V, Sánchez-Campos S, Tunõ'n MJ. Fruit polyphenols, immunity and inflammation. *Bri J Nutri* 2010; 104: S15-27.
 39. Bao MJ, Shen J, Jia YL, Li FF, Ma WJ, Shen HJ, et al. Apple polyphenol protects against cigarette smoke-induced acute lung injury. *Nutrition* 2013; 29: 235-43.

蘋果多酚在發炎的潛在應用

李慧禎^{1,2*}

¹中山醫學大學醫學系生化科

²中山醫學大學生化暨生物科技研究所

受文日期：民國 103 年 12 月 24 日；接受刊載：民國 103 年 12 月 25 日

摘要

蘋果中含有大量多酚，且被報告指出這些成分具有保健效益。而在學術研究上，一些體外及體內研究也顯示這些存在於蘋果中的功能性成分具有抗氧化及抗發炎的作用。在此，一些過往的研究將被回溯，以闡述在發炎疾病中蘋果多酚的潛在應用，而這些蘋果所能提供的健康助益可能有部分是來自於其擁有的抗氧化及抗發炎特性。

關鍵詞：蘋果多酚、活性氧、抗發炎作用、抗氧化作用

Original Article

Dementia, Mild Cognitive Impairment, and Depression among Hospitalized Veterans: a Prospective Study of their Prevalence and Risk Factors

Chi-Chiang Yang¹, Kee-Ching Jeng², Shwu-Tzy Wu³, Yi-Chun Lin⁴, Liang-Jen Chuo^{4,*}

¹Departments of Neurology and ²Medical Research, Tungs' Taichung MetroHarbor Hospital, Taichung, Taiwan

³Dayeh University, Changhua, Taiwan

⁴Department of Psychiatry, Taichung Veterans General Hospital, Taichung, Taiwan

Received: Mar. 24, 2014; Accepted: Sep. 2, 2014

Abstract

Objectives: To survey the prevalence and risk factors of depression, dementia, and mild cognitive impairment (MCI) in hospitalized elderly veterans.

Subjects: Hospitalized veterans aged over 65 years who provided written consents were recruited between January 2007 and December 2007.

Methods: The patients' mental illness was diagnosed within the first 24 h after admission and treated accordingly. A total of 1,286 patients underwent global geriatric assessment including history taking, physical examination, laboratory tests, and neuropsychological evaluations. The mental status was assessed using the Clinical Dementia Rating (CDR) scale, Geriatric Depression Scale (GDS), Activities of Daily Living (ADL) scale, Instrumental Activities of Daily Living (IADL) scale, Family Adaptability, Partnership, Growth, Affection, and Resolve (APGAR) score and American Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), Mini-Mental State Examination (MMSE), and Bless Dementia Rating Scale (BDRS) using 3 levels of screening.

Results: The mean age of the patients was 78.76 ± 4.84 years (range: 65–97 years). Seven hundred and eleven (55.3%) patients had a normal mental status. The prevalence of MCI, dementia, and depression was 18.7%, 13.1%, and 12.8%, respectively. The significant risk factors for dementia were lack of exercise, head injury, low body mass index, and stroke ($p < 0.01$). Depression was significantly associated with being single/widower and having diabetes, peptic ulcer, and stress ($p < 0.001$, 0.03, 0.001, and 0.001, respectively). Cardiac, hepatic, renal, and arthritic diseases and blood pressure were not associated with the mental status of these patients. MCI patients performed daily living activities with a normal ADL score but had poor IADL score (5.18 ± 4.10 vs. 1.99 ± 2.66 of the normal control). The APGAR score of the normal group (8.47 ± 2.47) was higher than that of the depression group (6.66 ± 2.94 , $p < 0.001$).

Conclusions: This study suggests that regular exercise is the key to maintain a normal mental status in elderly patients. They should be encouraged to participate in social activities to reduce the risk and progression of depression and dementia.

Key words: hospitalized veterans, dementia, mild cognitive impairment, depression, prevalence and risk factors

Introduction

The population of Taiwan is rapidly aging, with an increase in the proportion of elderly from 5.8% in

1989 to 10.98% in 2012^[1]. One important disease associated with aging is dementia. Dementia is defined as the loss of cognitive function (thinking, remembering, and reasoning) and behavioral abilities to an extent that interferes with a person's daily life and activities. The economic burden of dementia is enormous worldwide. In USA, the cost of 29.3 million patients with dementia was estimated to be approximately

*Correspondence to: Liang-Jen Chuo, Department of Psychiatry, Taichung Veterans General Hospital, 1650 Taiwan Boulevard Sect. 4, Taichung, Taiwan 40705, Taiwan (R.O.C.)

315 billion in 2005 and 604 billion in 2010^[2,3]. The most common cause of dementia in older individuals is Alzheimer's disease (AD). Currently, 35.6 million individuals are affected by AD worldwide, with an expected 115 million individuals by 2050^[4]. Other causes of dementia include brain disorders leading to vascular dementia, Lewy body dementia, and frontotemporal disorders. It has been suggested that the incidence of all-cause dementia almost doubles with every 5 years of age^[5] and the prevalence of dementia increases from approximately 2%–3% in those aged 65–75 years to 35% in those aged ≥85 years^[6]. Cognitive impairment is not well characterized, and its prevalence is unclear^[7,8]. Stratification of the prevalence of mild cognitive impairment (MCI) by type has important public health implications because the prognosis, symptoms, and treatment vary according to the type^[9-11]. In a recent study, 20% of the patients scored in the range of cognitive impairment, and 22% scored in the range of mild-to-moderate depression. Overall, 38% of the patients showed symptoms of dementia, depression, or both^[12]. Another study reported a high prevalence of cognitive dysfunction and depressive symptomatology, thus illustrating the importance of psychiatric care in the elderly^[13].

Depression may serve as a predictor of dementia in patients with subcortical vascular MCI (svMCI), albeit only in males. On the other hand, female patients with amnesic MCI (aMCI) who improved their normal cognition showed higher scores of depression at baseline, suggesting that longer follow-ups are warranted in these patients^[14]. Feeling lonely, rather than being alone, is associated with an increased risk of clinical dementia, and is considered a major risk factor, independently of vascular disease, depression, and other confounding factors. Feelings of loneliness may signal a prodromal stage of dementia^[15]. A randomized clinical trial on a home exercise program in MCI subjects showed a small benefit of exercise on global cognition^[16]. Similarly, a recent study showed cognitive improvement in MCI patients after 6 months of vigorous aerobic exercises^[17]. Therefore, the aim of this study was to investigate the prevalence and risk factors for depression, dementia, and MCI in hospitalized elderly veterans to improve prevention and care of the elderly population.

Methods

Hospitalized veterans from the Taichung Veterans General Hospital were recruited between January 2007 and December 2007. The study was approved by the Institutional Review Board of the Taichung Veterans General Hospital (IRB No. C06125), and all veterans provided written informed consent. The inclusion criteria were age >65 years and hospitalization at an internal medicine or surgery ward. The exclusion criteria were unconsciousness, coma, being illiterate, or unable to communicate.

The patients' mental illness was diagnosed within the first 24 h after admission and treated accordingly. All recruited patients underwent global geriatric assessment including clinical history taking, physical examination, laboratory tests, surgical risk evaluation, and functional and mental evaluations. The mental status of MCI, dementia, and depression was evaluated by Clinical Dementia Rating (CDR) scale, Geriatric Depression Scale (GDS), Activities of Daily Living (ADL) scale, Instrumental Activities of Daily Living (IADL) scale, Family Adaptability, Partnership, Growth, Affection, and Resolve (APGAR) score, Bless Dementia Rating Scale (BDRS), American Psychiatric Association Age-Related Cognitive Decline (ARCD) Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), and shortened Mini-Mental State Examination (MMSE). The evaluation was conducted at 3 levels: by the patients, nurses (research assistants), and psychiatrists. The evaluation for dementia and MCI included GDS, BDRS, IADL scale, and CDR scale. The APGAR score assesses adaptability, partnership, growth, affection, and resolve. An APGAR score of 7–10 represents high family support, 4–6 mild family support, and 0–3 poor family support. A patient receiving assistance from a family member was given a score of 2 (often), 1 (sometimes), or 0 (seldom). Practicing exercises was defined in the questionnaire as a 30-min exercise session at least 3 times per week. The mental status was assessed using 3 levels of tests performed by the patient, a nurse (research assistant), and a psychiatrist. The primary diagnosis was based on GDS, ADL scale, IADL scale, and Family APGAR score evaluated by the patients or their family members. Secondary diagnosis was evaluated by a research assistant using the shortened MMSE and CDR scale. The psychiatrist evaluated

patients suspected of mental illness according to the first screening with DSM-IV. Each scale measured a different aspect of the mental status.

This study also determined the prevalence and risk factors for depression, dementia, and MCI. Dementia and depression were diagnosed according to the DSM-IV criteria, whereas MCI was determined by the Petersen criteria.

Statistical analysis

Differences in cognitive scores between the patients were first compared by analysis of variance (ANOVA), Kruskal–Wallis (skewed data), or χ^2 tests, as appropriate. Group differences in cognitive status were analyzed by ANOVA, Kruskal–Wallis (skewed data), or χ^2 tests. Post-hoc *t* tests were performed as necessary. All analyses were performed using commercially available SAS software (version 9.2; Cary, NC, USA).

Results

Prevalence of MCI, dementia, and depression

The mean age of the male veterans was 78.76 \pm 4.84 years (range: 65–97 years). Among them, 711 (55.3%) patients had a normal mental status. The prevalence of MCI, dementia, and depression was 18.7%, 13.1%, and 12.8%, respectively (Table 1).

Mental status and social, physical, and habitual factors

Dementia was associated with lack of exercise, head injury, low body mass index (BMI), and stroke ($p < 0.01$). Depression was associated with being single/widower and having stress, diabetes, and peptic ulcer ($p < 0.001$, 0.001, 0.03, and 0.001, respectively; Table 2).

Blood pressure and cardiac, hepatic, renal, and arthritic diseases were not associated with the

Table 1. The demographic data of 1,286 hospitalized veterans

	No	Percentage	Age	High	Low
Normal	711	55.3%	78.3 \pm 4.8	97	65
MCI	241	18.7%	79.5 \pm 4.8	94	65
Dementia	169	13.1%	80.2 \pm 4.9	94	66
Depression	165	12.8%	78.3 \pm 4.7	93	65
Total	1286	100%	78.8 \pm 4.8	97	65

Table 2. Relationship of mental status and social, physical factors

	Normal	MCI	Dementia	Depression	Significance
Spouse	86.5%	80%	74.6%	77.0%	$\chi^2=19.73$, df = 3, $p < 0.001$
Stress	6.3%	12.4%	28.4%	54.5%	$\chi^2=246.23$, df = 3, $p < 0.001$
Exercise	78.1%	62.2%	44.4%	58.8	$\chi^2=86.77$, df = 3, $p < 0.001$
H. injury	14.5%	22%	27.2%	19.4%	$\chi^2=18.31$, df = 3, $p < 0.001$
Diabetes	22.2%	25%	29.0%	32.1%	$\chi^2=9.15$, df = 3, $p = 0.03$
Stroke	8.2%	12%	33.1%	12.1%	$\chi^2=77.17$, df = 3, $p < 0.001$
Peptic ulcer	19.1%	22%	16.0%	33.3%	$\chi^2=19.29$, df = 3, $p < 0.001$
Smoker	18.4%	17.8%	26.1%	17.2%	$\chi^2=6.03$, df = 3, $p = 0.11$
Alcohol abuse	7.9%	7.9%	8.9%	12.1%	$\chi^2=2.6$, df = 3, $p = 0.35$

Note: Chi-square analysis

patients' mental status (data not shown). However, dementia and depression were associated with low BMI (Table 3).

Comparison of mental status with various evaluations

Dementia was confirmed by the ADL scale, IADL scale, GDS, and BDRS in addition to MMSE. In contrast, MCI was detected only by GDS (Table 4). Family care was important for the mental status. MCI patients (MMSE score of >28 or CDR score of >0) performed daily living activities with a normal ADL score but had difficulties in performing complicated tasks (IADL score: 5.18 ± 4.10 vs. 1.99 ± 2.66 of the normal control). The APGAR score of the normal group (8.47 ± 2.47) was higher than that of the depression group (6.66 ± 2.94 , $p < 0.001$).

Discussion

The prevalence of MCI among hospitalized elderly male veterans was 18.7%. This finding was consistent with that of other studies (15.4%–17%) using rating scales or cognitive screening tests^[16-18]. We also demonstrate a strong association between dementia and lack of exercise, stroke, and head injury. On the other hand, depression was associated with stress, peptic ulcer, cigarette smoking, and alcohol abuse.

There is a strong association between lack of exercise and dementia. The protective role of exercise was confirmed in a recent follow-up study of 10 years^[19]. Presumably, exercise slows down the progression of dementia by increasing blood circulation, reducing blood sugar and lipid levels, and preventing stroke and diabetes. A study showed that exercise increased the mean arterial pressure (MAP) and cardiac output (CO) of both young (22 ± 1 years) and older (66 ± 2 years) individuals^[20]. At each exercise intensity, MAP was higher and CO was lower in the older group. Thus, despite the reduced cerebral perfusion and maximal exercise capacity of the older individuals, the 2 groups presented similar cerebral oxygenation and uptake of lactate and glucose during exercise.

We found that lack of a spouse (either single or widower) was a factor associated with dementia. It has been reported that feeling lonely is associated with an increased risk of clinical dementia later in life and can be considered a major risk factor^[14].

Table 3. BMI of hospitalized veterans

	Mean \pm SD	Max	Mini
Normal	24.24 ± 3.58	42.09	13.69
MCI	24.06 ± 4.09	36.20	15.90
Dementia	$22.93 \pm 3.61^*$	36.22	14.69
Depression	23.76 ± 3.94	36.63	13.81

Note: Difference between groups was compared with Scheffe's test. A significant difference was found between the normal and dementia. *, $p = 0.0048$.

$F_{(3, 1168)} = 4.723$, $p = 0.003$

Table 4. Comparison of mental status among four groups

	APGAR	GDS	BDRS
Normal	8.47 ± 2.47	1.67 ± 1.83	0.74 ± 0.94
MCI	8.07 ± 2.74	3.04 ± 2.42	2.51 ± 2.10
Dementia	7.10 ± 2.81	4.82 ± 3.51	7.34 ± 5.30
Depression	6.66 ± 2.94	8.50 ± 2.46	2.18 ± 3.26
	$F = 28.33$	$F = 422.99$	$F = 340.63$
	$p < 0.001$	$p < 0.001$	$p < 0.001$

Note: Family Adaptability, Partnership, Growth, Affection, and Resolve (APGAR) Score; Geriatric Depression Scale (GDS); Bless Dementia Rating Scale (BDRS).

Dementia and depression were also associated with low BMI for unknown reasons. In contrast, the mental status of these patients was not associated with cardiac, hepatic, renal, and arthritic diseases or with high blood pressure.

Memory and visuospatial symptoms were more frequent in dementia patients and MCI patients progressing into dementia. In the present study, dementia was consistently detected by MMSE, ADL scale, IADL scale, GDS, and BDRS. However, MCI was detected only by GDS. MCI and dementia are further differentiated into subtypes; therefore, the appropriate diagnosis is important for public health, because the prognosis, symptoms, and treatment vary according to the type^[9-11]. The APGAR score, which evaluates adaptability, partnership, growth, affection, and resolve, of the normal group (8.47 ± 2.47) was higher than that of the depression group (6.66 ± 2.94), indicating that family support is an important factor for the mental status.

This study was limited by the specific recruitment of hospitalized male elderly veterans. On the other hand, this study also has strengths. All clinical data and background evaluations were recorded prospectively and systematically. The patients were

evaluated for the mental status using 3 levels of tests by the patient, a nurse (research assistant), and a psychiatrist.

Conclusions

The study suggests that exercise is the key for a normal mental status among elderly patients. Exercise may reduce the progression of dementia by increasing blood flow, reducing blood sugar and lipid levels, and preventing stroke and diabetes. Encouraging elderly patients to participate in social activities may help them get more support and reduce their depression.

Acknowledgements

The authors would like to thank Enago (www.enago.tw) for the English language review.

References

1. www.moi.gov.tw/stat/english/index.asp searched on Feb 5, 2013.
2. Wimo A, Winblad B, Jönsson L. An estimate of the total worldwide societal costs of dementia in 2005. *Alzheimer's & Dementia* 2007; 3: 81-91.
3. Wimo A, Jönsson L, Bond J et al. The worldwide economic impact of dementia 2010. *Alzheimer's & Dementia* 2013; 9: 1-11.
4. World Health Organization. Dementia: a public health priority. 2014
5. Jorm AF, Jolley D. The incidence of dementia: a meta-analysis. *Neurology* 1998; 51: 728-33.
6. Canadian Study of Health and Aging: study methods and prevalence of dementia. *CMAJ* 1994; 150: 899-913.
7. Kawas H. The oldest old and the 90+ Study. *Alzheimers Dement* 2008; 4 (suppl 1): S56-9.
8. Boeve B, McCormick J, Smith G et al. Mild cognitive impairment in the oldest old. *Neurology* 2003; 60: 477-80.
9. Pioggiosi PP, Berardi D, Ferrari B, Quartesan R, De Ronchi D. Occurrence of cognitive impairment after age 90: MCI and other broadly used concepts. *Brain Res Bull* 2006; 68: 227-32.
10. AGS Clinical Practice Committee, Guidelines abstracted from the American Academy of Neurology's Dementia Guidelines for Early Detection, Diagnosis, and Management of Dementia. *J Am Geriatr Soc* 2003; 51: 869-73.
11. Ravaglia G, Forti P, Maioli F et al. Conversion of mild cognitive impairment to dementia: predictive role of mild cognitive impairment subtypes and vascular risk factors. *Dement Geriatr Cogn Disord* 2006; 21: 51-8.
12. Glasser M, Stearns JA, de Kemp E, van Hout J, Hott D. Dementia and depression symptomatology as assessed through screening tests of older patients in an outpatient clinic. *Fam Pract Res J* 1994; 14: 261-72.
13. Linka E, Bartko G, Agardi T, Kemeny K. Dementia and depression in elderly medical inpatients. *Int Psychogeriatr* 2000; 12: 67-75.
14. Kim SH, Kang HS, Kim HJ, Ryu HJ, Kim M, Seo SW, et al. Neuropsychiatric predictors of conversion to dementia both in patients with amnesic mild cognitive impairment and those with subcortical vascular MCI. *Clin Neurol Neurosurg* 2013; 115: 1264-70.
15. Holwerda TJ, Deeg DJ, Beekman AT, van Tilburg TG, Stek ML, Jonker C, et al. Feelings of loneliness, but not social isolation, predict dementia onset: results from the Amsterdam Study of the Elderly (AMSTEL). *J Neurol Neurosurg Psychiatry* 2014; 85: 135-42.
16. Lautenschlager NT, Cod KL, Flicker L, Foster JK, van Bockxmeer FM, Xiao J, et al. Effect of physical activity on cognitive function in older adults at risk for Alzheimer disease: A randomized trial. *JAMA* 2008; 300: 1027-37.
17. Baker LD, Frank LL, Foster-Schubert K, Green PS, Wilkinson CW, McTiernan A, et al. Effects of aerobic exercise on mild cognitive impairment: A controlled trial. *Arch Neurol* 2010; 67: 71-9.
18. Lopez OL, Jagust WJ, DeKosky ST et al. Prevalence and classification of mild cognitive impairment in the Cardiovascular Health Study Cognition Study. 1. *Arch Neurol* 2003; 60: 1385-9.
19. Artero S, Petersen R, Touchon J, Ritchie K. Revised criteria for mild cognitive impairment: validation within a longitudinal population study. *Dement Geriatr Cogn Disord* 2006; 22: 465-70.
20. Luck T, Riedel-Heller SG, Kaduszkiewicz H et al. Mild cognitive impairment in general practice: Age-specific prevalence and correlate results from the German Study on Ageing, Cognition and Dementia in Primary Care Patients (AgeCoDe). *Dement Geriatr Cogn Disord* 2007; 24: 307-16.
21. Jedrzejewski MK, Ewbank DC, Wang H, Trojanowski JQ. The Impact of Exercise, Cognitive Activities, and Socialization on Cognitive Function: Results From the National Long-Term Care Survey. *Am J Alzheimers Dis Other Demen* 2014 Jan 8. [Epub ahead of print].
22. Fisher JP, Hartwich D, Seifert T, Olesen ND, McNulty CL, Nielsen HB, et al. Cerebral perfusion, oxygenation and metabolism during exercise in young and elderly individuals. *J Physiol* 2013; 591: 1859-70.

住院榮民失智症、認知功能減退及憂鬱症之盛行率和危險因子調查研究

楊自強¹ 鄭啟清² 吳淑姿³ 林怡君⁴ 卓良珍^{4,*}

¹童綜合醫院神經內科 ²醫學研究部

³彰化大葉大學

⁴台中榮民總醫院精神部

受文日期：民國 103 年 3 月 24 日；接受刊載：民國 103 年 9 月 2 日

摘要

目的：調查住院之老榮民失智症、認知功能減退及憂鬱症之盛行率和危險因子之相關研究

對象：台中榮民總醫院住院之榮民年齡 65 歲以上有同意書參加者，調查時間 2007 年 1 月至 12 月止。

方法：住院之榮民於 24 小時內進行診斷與治療，包括病史、理學、生化及心理檢查。從正常老化到失智症之間的認知功能減退層級：以美國精神醫學會所提出的「年齡相關性知能減退」(ARCD DSM IV)、APGAR 量表(家庭關懷指數)、老年憂鬱量表 Geriatric Depression Scale、Braden 量表、簡短式智能評估(MMSE)、臨床失智量表 Clinical Dementia Rating Scale、來評估榮民樣本之記憶力、定向感、判斷力及解決事情之能力、社區之參與、居家生活及嗜好等，以瞭解失智榮民失智程度『質』的嚴重度。

結果：有效樣本 1286 人。平均年齡 78.76 歲 ± 4.84 歲(最大 97 歲，最小 65 歲)，皆為男性高齡榮民。精神狀態歸類為四大組：正常組 711 人(55.3%)，輕度認知減退(MCI) 241 人(18.7%)，憂鬱症 165 人(12.8%)，失智組 169 人(13.1%)。有配偶者正常組最多佔 86.5%，失智組最少佔 74.56%。有生活壓力者憂鬱組佔 54.55%，正常組最少佔 6.33%。曾有頭部外傷者失智組佔 27.22%，正常組最少佔 14.49%。有運動習慣者正常組佔 78.06%，組最少佔 44.38%。憂鬱者與單身、糖尿病、胃潰瘍及壓力有顯著關係($p < 0.001, 0.03, 0.001$ and 0.001)。憂鬱者與失智組之 BMI 都偏低。其他血壓、心、肝、腎及關節疾病則無關係。

結論：榮民有運動習慣者，不但其身體較健康其精神心理方面亦較正常。運動可以促進循環、降低血糖、減輕血管硬化、糖尿病、預防心臟病。應鼓勵老人參加社區活動，得到更多支持以減少憂鬱。

關鍵詞：失智症、認知功能減退、憂鬱症、盛行率、危險因子

* 通訊作者：卓良珍醫師 台中榮民總醫院精神部 台中市台灣大道路四段 1650 號

Original Article

Comparison of Two Educational Methods for Educating Primary Caregivers about Urinary Catheter Care in Homecare Patients

Fang-Chih Jao^{1,a}, Shu-Ting Chuang^{2,a}, Jeng-Yuan Chiou³, Lih-Ying Lin⁴,
Kee-Ching Jeng⁵, Chien Hung Kuo^{6,*}

¹Department of Nursing, HungKuang University

²Administrator, Buddhist Tzu Chi Taichung General Hospital

³School of Health Policy and Management, Chung Shan Medical University

⁴Department of Nursing, Taichung Veterans General Hospital

⁵Departments of Medical Research and ⁶Family Medicine, Tungs' Taichung MetroHarbor Hospital, Taichung, Taiwan

Received: Aug. 15, 2014; Accepted: Nov. 3, 2014

Abstract

Primary caregivers should be able to perform urinary catheter care to prevent urinary tract infections in homecare patients. The purpose of this study was to compare two educational methods, one using a standard instruction manual and the other using a multimedia video program, to teach primary caregivers how to take proper care of patients with an indwelling urinary catheter. In total, 80 participants were randomly allocated to either the conventional group as controls (n = 40) or the experimental group (n = 40). A standard score sheet was used to evaluate the primary caregivers' care of patients with a urinary catheter. Pre- and post-tests were conducted upon enrollment and right after the educational session. A follow-up post-test was conducted 2 months after the session. Data were analyzed with one-way analysis of variance (ANOVA), t-test, Pearson correlation coefficient, and generalized estimating equation (GEE) analyses. The results showed that there was no difference in the pre-test scores between the two groups. However, a significant difference was found between the scores of the experimental and control groups after the education session (79.28 vs. 64.63 for the post-test by GEE). Importantly, there was an even greater difference between the scores of two groups after 2 months (95.51 vs. 58.13 for the follow-up post-test). In addition, the experimental group had a higher rate of completion of the daily patient care record than the control group, particularly for the blood pressure and fluid intake volume data. Taken together, the experimental (multimedia) group was more effective than the control (conventional) group in preventing urinary tract infections. This indicates that the multimedia instructional method can also be used to teach primary caregivers other important homecare tasks.

Key words:

Introduction

The increase in the number of people aged over 65 years is going to be a burden for the elderly care in Taiwan (10.89% of the population in 2011)

according to the Department of Statistics, Ministry of the Interior, Republic of China^[1]. The demand for homecare services has dramatically increased along with the increase in the aging population. Traditionally, families have provided the bulk of long-term care for their disabled elderly relatives. In fact, only 1.71% of the elderly population in Taiwan lives in nursing homes or nursing institutions^[1]. In-family care meets the elderly relative's psychological needs for quality

*Correspondence to: Chien Hung Kuo, M.D., Department of Family Medicine, Tungs' Taichung MetroHarbor Hospital, No. 699 Taiwan Blvd., Sec 8, Taichung, Taiwan (R.O.C.)

^a Author F-C Jao and S-T Chuang contributed equally.

of life and family bond. This also reflects in agencies and organizations that design policies, programs, and services to promote "Aging in Place" in developed countries. A survey of health and living problems of the elderly in Taiwan showed that only 11.1% of the disabled elderly required long-term care; among them, 58.1% preferred homecare, with 31.8% and 10.1% receiving care in communities and institutions, respectively^[1].

Family caregivers have to cope with a plethora of burdens or stresses; therefore, they require basic training courses on "evaluation of physiological needs of homecare patients," "skilled care of the intubated patient," and "oral instruction for homecare patients"^[2]. However, healthcare practitioners have not seriously considered the assessment and improvement of healthcare knowledge of caregivers who need to learn how to perform medical procedures for patients' healthcare^[3, 4]. A survey of the perceptions of "the discussion of the hospital discharge plan with the disabled patient or family caregivers" revealed that only 11% of those surveyed felt that they had a good discussion with homecare providers, 62.4% felt that they only had a general discussion, 13.3% felt that the explanation of the healthcare plan was complete, and 7.4% and 3.9% complained that there was no discussion of the post-hospitalization issues and that no health educator participated in the discussion, respectively^[5]. Because family caregivers play an important role in the patient's daily life, the extent of the healthcare education is critical for the patient's welfare. Most disabled patients discharged from the hospital require a catheter (CA); therefore, the education of primary caregivers is critical for patients. An effective education plan that provides the caregiver with an adequate knowledge of catheterization care will help to prevent CA-induced urinary tract infections (CAUTIs) in homecare patients^[6-8].

A recent survey of the density of nosocomial infections in the medical centers and regional hospitals in Taiwan revealed that the incidence of CAUTI was 4.5 and 2.9%, respectively^[9]. Because urinary CA is commonly used by home healthcare patients, it is important to prevent UTIs with the appropriate management of CAs. Most caregivers for patients with indwelling urinary catheters (IUCs) acquire knowledge about healthcare from public health manuals or information sheets from conventional health education programs. However, such programs

may not adequately prepare primary caregivers for homecare patients. It has been shown that video instruction can be a very effective way for students to learn about patient care^[10-13]. With the help of multimedia tools, the instruction can be more interesting and impressive. Therefore, the purpose of this study was to investigate whether multimedia instruction was more effective than conventional instruction for education on IUC care by comparing the two methods for primary caregivers.

Methods

Subjects

This was a randomized, controlled trial. Between August 2009 to February 2010, subjects were recruited from Taichung City by the Homecare Nursing Service (HNS) at Taichung Veterans General Hospital (TCVGH). Nurses in HNS provide services to patients who live at home. The inclusion criteria for patients with IUC included the following: (1) aged 18 years or older, (2) receiving HNS, (3) requiring the long-term use of IUC, and (4) living in Taichung City.

The subjects were primary caregivers who spent most of their time with homecare patients. The study was approved by the Institutional Review Board of TCVGH (TCVGH IRB No. C09117). Eighty eligible subjects consented to participate in the study after they were informed about the study goals, and all of them signed a consent form. Subjects were randomized into two groups by a software program: the conventional (standard instruction with a health manual) and experimental (with both multimedia and health manual instruction) groups.

Multimedia video program

The multimedia video program was produced on the basis of a manual for homecare health education and combined visual and audio explanations and demonstrations by a teacher and some students. The information on the video disc was revised after being reviewed by a panel of seven experienced medical professionals, including a physician, a homecare nurse, a head nurse, a nursing lecturer, an infectious control nurse, and two multimedia teachers. After editing, two versions (Mandarin and Taiwanese) were made into a video disc of 17 min and 30 s, which consisted of six units: "The purpose of IUC," "How

to care his/her IUC and urinal bag," "The purpose of hand washing," "How to prepare the materials," "Recording the perineal condition," and "Watch list for IUC." The reliability of the multimedia video program was then tested on 20 subjects (primary caregivers in a similar situation as the study participants) and was evaluated by a questionnaire covering the patient's health educational materials (form prepared by the Department of Nursing, TCVGH). Four scale-levels were evaluated for the program. The results showed that all 20 subjects agreed that the content was clear, the word size was appropriate, and the program was very helpful.

Intervention

The primary caregivers were instructed using either the conventional or multimedia method by the investigator. Upon enrollment and group assignment, the pre-test was administered and the post-tests were conducted immediately after the educational session. For the multimedia group, any portion of the video could be replayed as required. A follow-up post-test was conducted 2 months after the session.

Validity and reliability of the test

A test score sheet was developed using the perineal cleansing manual (2007) from the Department of Nursing, TCVGH and the evaluation form for caregivers' skill on perineal cleansing and urinary CA care (2007, Ministry of Labor, Executive Yuan, ROC). The test was reviewed by a panel of seven experts/medical professionals, including a physician, a homecare nurse, a head nurse, a nursing lecturer, an infectious control nurse, and two multimedia teachers, to establish the relevance of each topic and content and the appropriateness of the wording. The five scale-levels of the test were evaluated, and content validity index (CVI) of the test was found to be 0.94–1.00. The reliability of the test was evaluated by an investigator and one observer for each subject separately (20 subjects for the pre-test) for internal consistency. The reliability (Cronbach's alpha) of the test was 0.94. The test contained 20 items; each item had a score of 5 (correct) or 0 (not correct). To pass the test for IUC care competency, the test score had to be above 60 (addendum).

Patient's homecare record

Because better care of IUC may also be reflected

in the overall performance or attitude of a primary caregiver toward his/her disabled elderly relative, we also evaluated the completeness of the patient's daily homecare record, including blood pressure, body temperature, perineal care, fluid intake volume, and urine volume, color, leakage, precipitation, and bag drainage.

Statistical analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 12 (SPSS, Inc., Chicago, IL). Independent variables were either nominal or continuous data. Descriptive data such as gender, age, educational level, relationship to the patient, residence of the patient, and foreign caregiver were analyzed with one-way analysis of variance (ANOVA) and reported as percentage, mean, and standard deviation. The paired t-test and generalized estimating equation (GEE) were used to evaluate the observer's and investigator's scores of primary caregivers' patient care. An independent test (t-test) was used to assess the daily records of homecare patients.

Results

Eighty subjects were recruited for this study (40 in each group). Most caregivers were middle-aged (41–60 years old) females (27 and 13 vs. 22 and 18 females and males in the control vs. experimental groups). Most of them had high school or college education (67.5% vs. 57.5% for the control vs. experimental group). Only five subjects had not taken the health education course for IUC care (Table 1). There were no differences in the patients' gender, age, number of diseases, Barthel indices, and Karnofsky scales between the two groups (Table 2).

Pre- and post-tests were conducted to evaluate the caregivers' care of patients with IUC. There was no difference in the pre-test scores between the two groups. However, the experimental group had better scores than the control group immediately after the education session ($p < 0.01$, Figure 1). Importantly, the difference between the scores was larger 2 months after the session, with test scores in the experimental group being higher than those in the control group (95.5 vs. 58.1, $p < 0.01$).

In addition, subjects in the experimental group had a higher completion rate for the daily patient

Table 1. Demographic characteristics of the primary caregivers

Items	Control group (%)	Experimental group (%)	<i>p</i> -value
Gender			.25
Male	13 (32.5)	18 (45.0)	
Female	27 (67.5)	22 (55.0)	
Age (years)			.49
≤ 40	5 (12.5)	6 (15.0)	
41-60	27 (67.5)	24 (60.0)	
61-80	5 (12.5)	9 (22.5)	
81-100	3 (7.5)	1 (2.5)	
Education level			.82
Primary school	8 (20.0)	11 (27.5)	
Middle school	5 (12.5)	6 (15.0)	
High school	17 (42.5)	15 (37.5)	
College	10 (25.0)	8 (20.0)	
Relationship with the patient			.37
Spouse	14 (35.0)	9 (22.5)	
Parent(s)	1 (2.5)	2 (5.0)	
Children	22 (55.0)	28 (70.0)	
Others	3 (7.5)	1 (2.5)	
Assistance from a foreign caregiver			.64
Yes	27 (67.5)	24 (60.0)	
No	13 (32.5)	16 (40.0)	
Living with the patient			1.00
Yes	38 (95.0)	38 (95.0)	
No	2 (5.0)	2 (5.0)	
Previous health education as part of the patient's discharge plan			1.00
Yes	37 (92.5)	38 (95.0)	
No	3 (7.5)	2 (5.0)	

Two groups of caregivers were assigned randomly, each group consisted of 40 subjects.

care record, particularly for blood pressure ($p < 0.01$) and fluid intake volume ($p < 0.01$), than those in the control group (Table 3).

Discussion

In this study, there were more female than male primary caregivers. This was consistent with previous findings that females were more likely to care for family members and willing to sacrifice for others as wives, mothers, and career women^[14,15]. Most caregivers had either high school or college education. This reflected a positive relationship with the attitude and intellectual level in these caregivers^[14,16].

Traditionally, more than half of the elderly population prefers to live with their adult children, and in this study, 95% of caregivers lived with a disabled elderly relative. This relationship can meet the needs of the elderly persons for both quality of life and family bonding and allows the caregivers to fulfill their filial obligations as well. Most caregivers were aged between 41 to 60 years, which indicated that they were still capable of caring for a disabled elderly relative. However, 60%–68% of participants had hired a foreign caregiver. The foreign caregiver could assume some of the burdens of care and improved the family's quality of life^[17]. We found that 92.5% of subjects had previously received some training in

Table 2. Demographic characteristics of the patients

Items	Control group (%)	Experimental group (%)	p-value
Gender			.36
Male	18 (45.0)	13 (32.5)	
Female	22 (55.0)	27 (67.5)	
Age (years)			.88
≤ 40	1 (2.5)	1 (2.5)	
41-60	1 (2.5)	2(5.0)	
61-80	19 (47.5)	16 (40.0)	
81-100	19 (47.5)	21 (52.5)	
Number of diseases			.83
1	2 (5.0)	1 (2.5)	
2	13 (32.5)	14 (35.0)	
> 3	25 (62.5)	25 (62.5)	
Barthel index			.51
Total dependence	36 (90.00)	37 (92.5)	
High dependence	3 (7.50)	2 (5.00)	
Partial dependence	1 (2.50)	1 (2.50)	
Karnofsky scale			1.00
Level 3	15 (37.5)	16 (40.00)	
Level 4	25 (62.5)	24 (60.0)	

the care of patients with IUCs. This result was similar to the findings of other studies that had reported an 87%–95% rate of participation in the nursing education that was provided through patient discharge planning services^[18,19]. Similar to other reports, there were more female than male patients in this study and they also reflected a trend of disabled elderly persons aged above 60 years^[14,15]. The advancement of medical research and technology has increased not only the average life span but also the number of disabled elderly persons^[17]. The present study had no bias in the sampling between the two groups of patients because they had similar disease characteristics. Most patients (62.5%) in this study had more than three types of illnesses. In total, 90% of our patients were found to be totally dependent on a caregiver, as shown by the Barthel index (Table 2). It has been well-known that elderly persons with chronic diseases require more medical services and can cause a heavy healthcare burden on every country. The education of caregivers should play an integral role of the practitioner's efforts for patient care and reduce the complications of CAUTI^[20].

The present results showed that the pre-test

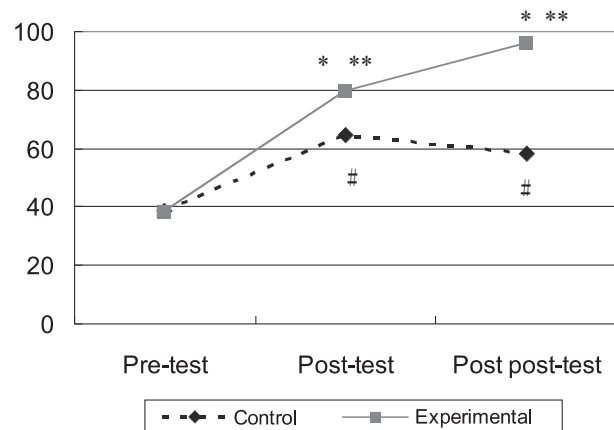


Figure 1. Effects of the two methods of health education on primary caregivers' ability to treat patients with indwelling urinary catheter (IUC). Subjects were evaluated by pre-, post, and post-post-test scores for care of IUC patients. *, vs. the Pre-tests or Post-test of the experimental (multimedia) group, $p < 0.01$. **, vs. Post-test or Post-post test of Control. #, vs. the Pre-test of control, $p < 0.01$.

scores of the caregiver's knowledge of the care of patients with IUC were very poor. This indicated that there was a need to improve the health education programs upon the patient's discharge or there

Table 3. Comparison of the completeness of the daily patient care records for 60 days

Items	Control Group Mean \pm SD (days)	Experimental group Mean \pm SD (days)	t-value	p-value
Blood pressure	55.80 \pm 6.97	59.00 \pm 2.79	2.70	< 0.001
Body temperature	57.03 \pm 5.46	56.90 \pm 11.32	0.06	0.95
Perineal care	59.40 \pm 2.69	59.55 \pm 2.00	0.28	0.78
Liquid intake	56.80 \pm 5.99	59.80 \pm 1.26	3.10	< 0.001
Urine volume	59.80 \pm 1.26	60.00 \pm 0.00	1.00	0.32
Urine color	60.00 \pm 0.00	60.00 \pm 0.00	-	-
Urine leakage	58.95 \pm 3.27	59.55 \pm 2.00	0.99	0.33
Urine precipitate	60.00 \pm 0.00	60.00 \pm 0.00	-	-
Urine bag drainage	60.00 \pm 0.00	60.00 \pm 0.00	-	-

was memory loss over time^[21]. However, the post-test results showed that both types of educational methods increased the caregiver's knowledge of patient care. Importantly, the experimental (multimedia) group had significantly better scores. This finding was similar to reports that have indicated that a proper education program can increase the caregiver's knowledge and technique and can reduce the occurrence of CA-associated complications^[20,22]. Multimedia instruction offers distinct advantages over traditional instruction by providing individualized advice and learning^[23]. Therefore, it is not surprising that the retention rate was 20% for visual learning alone, 30% for audio learning alone, 50% for both, and 80% for audio/visual learning and participation in nursing practice activities^[24,25]. Interestingly, there was a marked difference between the follow-up post-test scores of the two groups in our study (95.51 for the experimental group vs. 58.13 for the control group). This indicated that learning retention could be reinforced through daily practice using the multimedia method. The average score of the control group was lower than that on the previous post-test, and this could be because of the failure to retain information over a longer period of time^[21].

In the present study, most daily patient care records of two groups were similar, except for records of blood pressure and fluid intake volume. The experimental group had a significantly higher completion rate of these records than the control group. This result may be because of the motivation by the educational method. Because the records of blood pressure and fluid intake volume were normally registered by a nurse during the hospital stay, the

caregiver may forget to record them. However, the trust built between the homecare nurse and primary caregiver enhanced the latter's motivation to learn more about health issues; therefore, they could take better care of their disabled elderly relative.

In summary, primary caregivers who were taught using the multimedia method demonstrated a better ability to prevent CAUTI in homecare patients than those who were taught using the conventional method. The multimedia approach can also be applied to teaching primary caregivers other important homecare issues.

References

1. Ministry of the Interior, Department of Statistics: Retrieved on May 22, 2010. <http://www.moi.gov.tw/stat/english/survey.asp>.
2. Chen CH, Huang TT: Preference for the attributes of home care service among primary family caregivers. *J Nurs* 2008; 55(2): 49-57.
3. Bevan JL, Pecchioni LL: Understanding the impact of family caregiver cancer literacy on patient health outcomes. *Pat Educ Couns* 2008; 71(3): 356-64.
4. Martin MY, Sanders S, Griffin JM, et al: Racial variation in the cancer caregiving experience: A multisite study of colorectal and lung cancer caregivers. *Cancer Nursing* 2012; 4: 249-56.
5. Tsai TH, Chuang KY, Dai YT, Tseng SF, Wu SC: Evaluation of discharge planning services for stroke patients with disabilities: Patient perspectives. *Taiwan J Public Health* 2004; 23(2): 235-48.
6. Cheung K, Leung P, Wong YC, et al: Water versus antiseptic periurethral cleansing before catheterization among home care patients: a randomized controlled trial. *Am J Inf Control* 2008; 36(5): 375-80.
7. Tambyah PA, Maki DG: Catheter-associated urinary tract infection is rarely symptomatic. *Arch Intern Med* 2000; 160(5): 678-82.

8. Tenke P, Kovacs B, Truls E, Johansen B, Matsumoto T, Tambyah PA, Naber KG: European and Asian guidelines on management and prevention of catheter-associated urinary tract infections. *Int J Antimicrobial Agents*, 2008; 31(1): S68-S78.
9. CDC Taiwan. www.cdc.gov.tw/english/downloadfile.aspx?fid=670B310D2DDB76A0. Retrieved on September 12, 2011.
10. Chuen YC, Chiang LC: Effectiveness of hand-washing teaching programs for families of children in paediatric intensive care units. *J Clin Nurs* 2007; 16: 1173-9.
11. Kelly M, Lyng C, McGrath M, Cannon G: A multi-method study to determine the effectiveness of, and student attitudes to, online instructional videos for teaching clinical nursing skills. *Nurse Edu Today* 2009; 29, 292-300.
12. Minton PN: Video tape instruction: An effective way to learn. *Rehab Nursing* 1983; 8(3): 15-7.
13. Rosser JC, Herman B, Risucci DA, Murayama M, Rosser L, Merrell RC: Effectiveness of a CD-ROM multimedia tutorial in transferring cognitive knowledge essential for laparoscopic skill training. *Am J Surgery* 2000; 179(4): 320-4.
14. Chen CY, Chen CC, Tsai MT, Shen YC, Chou HK, Woung LC: The research about the factors affecting the quality of life for caregivers of patients at home. *J Long-term Care* 2008; 12(3): 267-83.
15. Cheng SR, Tseng Y: Study of the care needs and satisfaction among primary family caregivers of homecare dementia patients. *VGH Nursing* 2008; 25(4): 386-92.
16. Ho MM, Hor YS, Li SC, Hwang PC, Wang MH, Chen ML: The exploration of home care patients' unplanned extubation and the primary caregivers' knowledge, and learning needs related to tubing care. *J Long-term Care* 2008; 12(1): 72-90.
17. Lee SD: Development and promotion of long-term care. *Taiwan Med J* 2010; 53(1): 44-50.
18. Lin SR, Tseng HJ, Chen ML, Huang HL: Improvement of discharge planning for cerebrovascular accident patients. *Chang Gung Nursing* 2009; 20(3): 91-102.
19. Suz LY, Liu FC, Chou HC, Maa SH: Total knee replacement pain management: enhancing nursing instructions. *J Nurs* 2009; 56(1): 63-72.
20. Herter R, Kazer MW: Best practices in urinary catheter care. *Home Healthc Nurse* 2010; 28(6): 342-9.
21. Gilmartin ME: Pulmonary rehabilitation. Patient and family education. *Clin Chest Med* 1986; 7(4): 619-27.
22. Lin JL, Hsieh PS, Lin SH, Song MH, Wang SF: The effectiveness of caregiver education for caring nasogastric tube. *Tzu Chi Nurs J* 2005; 4(2): 49-56.
23. Garrett BM, Callear D: The value of intelligent multimedia simulation for teaching clinical decision-making skills. *Nurse Education Today* 2001; 21(5): 382-90.
24. Her SM, Luo FJ: The strategy of efficiency improvement for multimedia ward orientation. *VGH Nursing* 2002; 19(2): 179-85.
25. Kuo YW, Chiang LC, Wu SL, Kuo HW: The effectiveness of a home rehabilitation nursing program in caregivers of stroke patients. *J Evid Based Nurs* 2006; 2(2): 109-18.

(Addendum) Evaluation of indwelling urinary catheter care 導尿管照護評核表之評分標準

姓名：

病歷號：

編號：

Evaluation items 護評項目	分數	年 月 日	年 月 日	年 月 日
		得分	得分	得分
1. 準備沖洗用品及垃圾袋	5			
2. 能在沖洗壺內備妥適量的溫水，以不燙能接受的水溫為原則	5			
3. 能關門窗或拉上布簾保護個案隱私	5			
4. 執行清洗前正確洗手	5			
5. 採光明亮	5			
6. 注意保暖	5			
7. 能協助個案抬高臀部，放置看護墊及便盆於案主腰臀以下	5			
8. 姿勢 女性：採曲膝仰臥式 男性：採平躺雙腿微張	5			
9. 清潔方法 女性：由內往外的方式清潔尿道口→陰道→肛門口→兩側陰唇 男性：一手握住陰莖，以環狀方式清潔尿道口及導尿管接觸的部位	5			
10. 沖洗步驟 女性：棉棒由上而下只擦一次 男性：棉棒能由內而外	5			
11. 清潔後擦乾外陰部後協助穿上紙褲或衣褲，整理個案床單	5			
12. 能正確擠壓尿管、避免尿管連接處脫落、折到或壓到，以保持暢通	5			
13. 導尿管以紙膠井字法、紗布或褲襪、人工皮固定黏貼固定在皮膚上	5			
14. 維持導尿密閉系統的完整性，尿袋高度要低於膀胱位置(但不可置放於地面上)	5			
15. 攝取新鮮果汁(維他命c或蔓越梅，糖尿病個案宜注意維持血糖的穩定)	5			
16. 每日給予液體 2500-3000c. c. (註：醫囑指示限水個案除外)	5			
17. 觀察尿液的顏色及性狀注意混濁或沈澱物	5			
18. 觀察會陰分泌物之量、顏色以及氣味情形	5			
19. 清洗便盆及沖洗壺	5			
20. 執行清潔後正確洗手	5			
Score 得分	100			

註：1. 執行正確一題得5分 2. 不正確則不給分

3. 衛教居家主要照顧者後測驗之評值(二)得分需達到60分以上。

兩種不同衛教方案對居家主要照顧者執行導尿管照護成效之探討

饒芳枝^{1,a} 莊淑婷^{2,a} 邱政元³ 林麗英⁴ 鄭啟清⁵ 郭建宏^{6,*}

¹弘光科技大學護理系

²台中慈濟醫院

³中山醫學大學醫療產業科技管理學系

⁴台中榮總護理部

童綜合醫院 ⁵醫研部 ⁶家醫科

受文日期：民國 103 年 8 月 15 日；接受刊載：民國 103 年 11 月 3 日

摘要

本研究目的在探討兩種不同衛教方案對居家主要照顧者執行導尿管照護之成效。自民國 98 年 8 月至 99 年 2 月採用兩組前後測設計法，選取台中縣、市居家導尿管個案之主要照顧者，採電腦軟體隨機分配至實驗組及對照組各 40 名。實驗組以多媒體影音光碟及傳統衛教手冊為介入措施，對照組則僅給予傳統衛教手冊，以「居家導尿管照護評量表」為評估工具，前測於衛教介入前，後測則分別於衛教後立即測及第 2 個月共收集 2 次後測資料。資料以 Excel 進行資料建檔再以 SPSS 12.0 所得資料以卡方檢定、單因子變異數分析、t 檢定、皮爾森積差相關分析及廣義估計方程式 (GEE) 進行統計分析。研究結果發現：(1) 在兩種不同衛教方案介入後主要照顧者導尿管照護正確得分：實驗組前測 38.13 分、後測得分為 79.28 分，後後測得分為 95.51 分；對照組前測 38.88 分、後測得分為 64.63 分，後後測得分為 58.13 分，實驗組後後正確率上升 57.38 分；對照組後後正確率上升 19.25 分，故實驗組後後測較前測進步幅度顯著大於對照組 ($p=.00$, GEE)。(2) 兩組居家個案照護紀錄表完成率之比較介入 2 個月後「居家個案照護紀錄表」完成率項目中血壓、液體攝入量完成率，實驗組高於對照組且有顯著差異。結論：多媒體影音光碟及傳統衛教手冊的介入後，可有效增進居家主要照顧者導尿管照護成效。未來多媒體影音光碟及傳統衛教手冊可應用在居家護理臨床實務上，給予主要照顧者完整且具體的護理指導。

關鍵詞：主要照顧者、多媒體影音光碟衛教、導尿管

* 通訊作者：郭建宏 童綜合醫療社團法人童綜合醫院家醫科 43503 臺中市梧棲區臺灣大道八段 699 號

^a 饒芳枝、莊淑婷相同貢獻作者。

Case Report

Spontaneous Interstitial Pregnancy after Ipsilateral Laparoscopic Total Salpingectomy: A case report and literature review

Wen-Sheng Wang^{*}, Tian-Yung Wei, Heng-Feng Kao

Department of Obstetrics and Gynecology, Tungs' Taichung MetroHarbor Hospital

Received: Dec. 2, 2013; Accepted: Feb. 11, 2014

Abstract

Ectopic pregnancies occurring in the interstitial portion of the fallopian tube after ipsilateral total salpingectomy are rare. However, a careful diagnosis of the location of gestation in the following pregnancy is critical so as not to overlook a recurrent ectopic pregnancy after salpingectomy. This case report presents an unusual case of a laparoscopically treated spontaneous interstitial pregnancy that occurred 3 months after ipsilateral laparoscopic total salpingectomy. Early diagnosis of ipsilateral interstitial pregnancies after total salpingectomy is difficult. The treatment of interstitial pregnancies is inherently more challenging and difficult and it is associated with a high mortality rate compared with other ectopic pregnancies. Close monitoring of ensuing pregnancies in these patients is important and early diagnosis should be emphasized to avoid possible complications because of a delayed diagnosis.

Key words: interstitial pregnancy, ectopic pregnancy, total salpingectomy

Introduction

An ectopic pregnancy is one of the major gynecologic emergencies and occurs in approximately 1%–2% of all pregnancies^[1,2,3]. The incidence of ectopic pregnancies has markedly increased over the last 3 decades^[1], partly because of the increased prevalence of sexually transmitted infections and the use of assisted reproductive technology (ART)^[4]. However, ectopic pregnancies in the interstitial portion of the fallopian tube after ipsilateral salpingectomy are rare and are usually associated with the use of ART; they are less likely to occur after natural conception^[5]. Here we report a case of a spontaneous ectopic pregnancy occurring in the interstitial portion of the fallopian tube after ipsilateral salpingectomy.

Case Report

A 38-year-old female (gravid 5, para 2) presented to the emergency department of our hospital on account of severe lower abdominal pain and vaginal bleeding for 5 h. The patient's history included 2 previous cesarean sections, 1 miscarriage, and 1 ectopic pregnancy. She had undergone total salpingectomy of the left fallopian tube because of a ruptured tubal pregnancy in our hospital 3 months prior to this admission. On initial physical examination, her blood pressure was 95/58 mmHg and her pulse rate was 72 beats/min. Her abdomen was diffusely tender with rebound tenderness.

Her urine pregnancy test results were positive [serum β -human chorionic gonadotropin (β -hCG) was 2353 IU/L] and her hemoglobin levels were 12.3 g/dL. Ultrasonography demonstrated hemoperitoneum, with no intrauterine gestational sac. The patient consented to laparoscopy because of heavy internal bleeding with a presumptive diagnosis of an ectopic

*Correspondence to: Wen-Sheng Wang, Department of Obstetrics and Gynecology, Tungs' Taichung MetroHarbor Hospital, No. 699, Sec. 8, Taiwan Blvd., Wuqi Dist., Taichung City 435, Taiwan (R.O.C.)

pregnancy. A ruptured interstitial pregnancy with active bleeding was observed on the left uterine cornu. Approximately 2,000 mL of bloody fluid and clots were observed in the pelvic cavity (Fig. 1A-1B) for which she received blood transfusion of 8 units of packed RBC. The bloody fluid and clots were removed and laparoscopic electrocoagulation of the cornu was performed using bipolar forceps (Fig. 1C) to assure hemostasis. A corpus luteum indicative of pregnancy was observed in the right ovary (Fig. 1D).

The products of conception were confirmed by histopathological analysis. The patient's postoperative course was uneventful. She was discharged from the hospital on postoperative day 7 and was followed-up as an outpatient until her β -hCG levels decreased below 5 IU/L. No complications were detected during the follow-up period.

Discussion

In this report, we presented an unusual case of a spontaneous pregnancy in the interstitial portion of the fallopian tube that occurred 3 months after ipsilateral laparoscopic total salpingectomy. To date, the incidence of ipsilateral interstitial pregnancies after total salpingectomy remains unknown. Takeda reported 2 cases in his series, approximately 1.16% of the 173 ectopic pregnancies treated using laparoscopic surgery from 1994 to 2005^[6]. Thus, a spontaneous interstitial ectopic pregnancy after ipsilateral salpingectomy is an unusual occurrence^[7].

Several possible mechanisms have been described for a recurrent ipsilateral ectopic pregnancy after salpingectomy^[6,8,9,10]. In this case, the left fallopian tube was removed by total salpingectomy because of a previous tubal pregnancy and

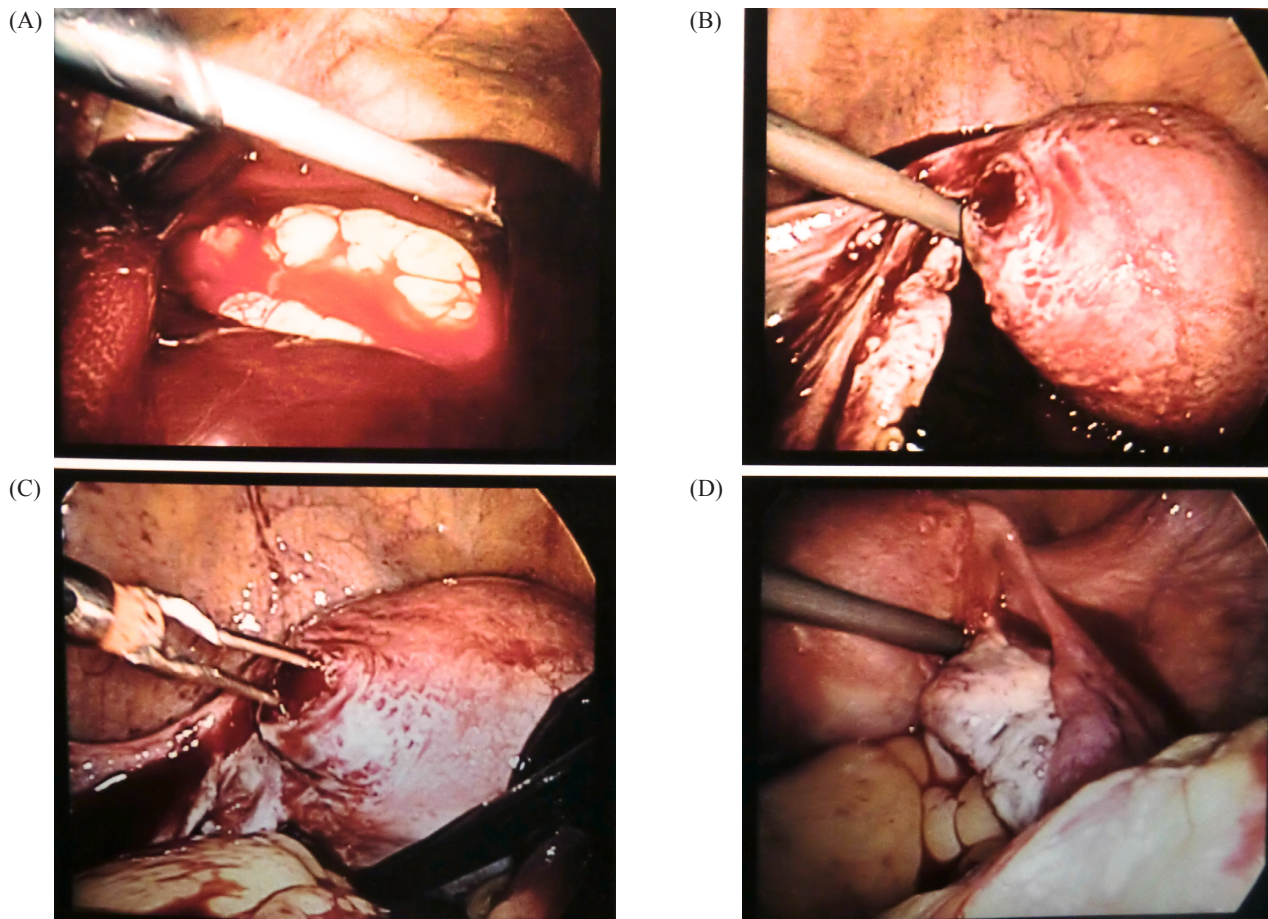


Fig 1. (A-B) Laparoscopic view of a ruptured left interstitial pregnancy with active bleeding. Approximately 2,000 mL of bloody fluid and clots were loaded in the pelvic cavity. (C) Electrocoagulation with bipolar forceps without suture. (D) Corpus luteum cyst (arrow) of the right ovary.

the corpus luteum was observed in the ovary on the opposite side. It is possible that after ovulation from the right ovary, an oocyte may have been normally fertilized in the right fallopian tube and later implanted in the contralateral interstitial portion by intrauterine transmigration^[11,12].

Interstitial gestation is one of the most hazardous types of ectopic pregnancies. An interstitial ectopic pregnancy is defined as the implantation of the embryo in the intrauterine portion of the fallopian tube. Because of its location, diagnosis and treatment of an interstitial ectopic pregnancy are challenging and it frequently constitutes a medical emergency. Although interstitial ectopic pregnancies can rupture late in the second trimester, it may rupture as early as gestation weeks 7–9 in the second trimester^[13]. Significant maternal hemorrhage leading to hypovolemia and shock can rapidly result from interstitial rupture. Although the overall mortality rate for ectopic pregnancies has steadily decreased to 0.14% over the past 5 decades, the mortality rate for interstitial pregnancies remains at 2.0%–2.5%^[14]. This high mortality rate is partially because of the difficulties in early diagnosis as well as the rapid hemorrhage that occurs after rupture^[13,15,16].

Transvaginal ultrasound is the most useful diagnostic tool for establishing a diagnosis through serial serum β -hCG measurements and can be followed by laparoscopy to confirm the diagnosis^[3]. However, an early ultrasound may show such interstitial pregnancies surrounded by the myometrium, which can be mistaken for normally implanted pregnancies. The sonographic signs used to diagnose interstitial pregnancies are as follows: eccentric location of the gestational sac proximal to the uterine cornu; the gestational sac surrounded by a thin (<5 mm) myometrium, close to the uterine serosa^[17]; and an “interstitial line,” defined as an echogenic line that extends from the most superior and lateral aspect of the endometrium to the midportion of the interstitial mass or sac^[18]. The interstitial line possibly represents the endometrial canal or the interstitial portion of the fallopian tube, depending on the size of the gestation^[18]. Among the diagnostic indications of an interstitial pregnancy, data from previous small series suggest that the interstitial line is more useful than the presence of myometrial thinning or the location of the eccentric sac^[18,19]. Transvaginal three-dimensional ultrasound can generate the uterine coronal

plane, facilitating determination of the exact location of the gestational sac relative to the uterine cornu^[20]. Taken together, the specificity of ultrasound findings is 88%–93%, whereas the sensitivity is only 40%^[21]. Therefore, the diagnosis of an interstitial pregnancy is dependent on the quality of ultrasound and the skills of the investigator, particularly in case of hemodynamically stable patients.

When an unruptured interstitial pregnancy is diagnosed, several conservative management options can be used. Local or systemic injection of methotrexate has been used successfully^[14,16,21,22]. Methotrexate can be administered by the parenteral route or methotrexate or potassium chloride can be directly injected into the interstitial gestational sac with ultrasonographic guidance^[22,23]. Because of the high risk of rupture with serious or fatal bleeding, surgery is the most common management option. Although traditional laparotomy with hysterectomy or interstitial resection is the main surgical intervention for interstitial pregnancies during late gestation or after rupture, an increasing number of laparoscopic or even hysteroscopic fertility-preserving conservative approaches has been used recently^[24]. One of the advantages of using conservative treatment for interstitial pregnancies with or without rupture is the preservation of fertility, whereas the key disadvantage is the risk of uterine rupture during subsequent pregnancies. When conservative treatment with uterine preservation is considered, laparoscopic interstitial resection and selective uterine artery embolization are needed^[20,25,26]. Some authors have used electric cauterization for bleeding control and interstitial incision without sutures^[27].

Interstitial pregnancies often rupture later than other tubal pregnancies because the overlying myometrium is more distensible than the fallopian tube. The intramural tubal segment lies in close proximity to the uterine artery and interstitial tubal rupture usually results in brisk hemorrhage and higher maternal morbidity and mortality rates than other ectopic pregnancies. In the present case, although the interstitial region was found to be ruptured with massive hemorrhage in the abdominal cavity, we successfully controlled the bleeding through laparoscopic electric cauterization.

Because spontaneous interstitial pregnancies after ipsilateral salpingectomy are rare, the optimal methods to prevent such ectopic pregnancies remain

unknown. Thus, even if nearly complete resection of the fallopian tube is achieved previously, as in our present case, avoiding the occurrence of interstitial pregnancies after ipsilateral salpingectomy may be difficult, thus stressing the need and importance for careful ultrasound monitoring during the early stages of pregnancy in patients with a history of prior salpingectomy having at least one normal functioning ovary.

References

- Rajkhowa M, Glass MR, Rutherford AJ. Trends in the incidence of ectopic pregnancy in England and Wales from 1966 to 1996. *Brit J Obstet Gynaecol* 2000; 107: 369-74.
- Tulandi T. Reproductive performance of women after two tubal ectopic pregnancies. *Fertil Steril* 1988; 50:164-6.
- Dialani V, Leveine D. Ectopic pregnancy: a review. *Ultrasound Q* 2004; 20: 105-17.
- Gracia CR, Barnhan KT. Diagnosing ectopic pregnancy: decision analysis comparing six strategies. *Obstet Gynecol* 2001; 97: 464-70.
- Oron G, Tulandi T. A pragmatic and evidence-based management of ectopic pregnancy. *J Minim Invasive Gynecol* 2013; 20: 446-54.
- Takeda A, Manabe S, Mitsui T, Nakamura H. Spontaneous ectopic pregnancy occurring in the isthmic portion of the remnant tube after ipsilateral adnexectomy: report of two cases. *J Obstet Gynaecol Res* 2006; 32: 190-4.
- Sturlese E, Retto G, Palmara V, De Dominicis R, et al. Ectopic pregnancy in tubal remnant stump after ipsilateral adnexectomy for cystic teratoma. *Arch Gynecol Obstet* 2009; 280: 1015-17.
- Zuzarte R, Khong CC. Recurrent ectopic pregnancy following ipsilateral partial salpingectomy. *Singapore Med J* 2005; 46: 476-8.
- Milingos DS, Black M, Bain C. Three surgically managed ipsilateral spontaneous ectopic pregnancies. *Obstet Gynecol* 2008; 112: 458-9.
- Yano T, Ishida H, Kinoshita T. Spontaneous ectopic pregnancy occurring in the remnant tube after ipsilateral salpingectomy: a report of 2 cases. *Reprod Med Biol* 2009; 8: 177-9.
- Bernardini L, Valenzano M, Foglia G. Spontaneous interstitial pregnancy on a tubal stump after unilateral adnexectomy followed by transvaginal colour Doppler ultrasound. *Hum Reprod* 1998; 13: 1723-6.
- Chou SY, Hsu MI, Chow PK, Chiang HK, Su HW, Hsu CS. Recurrent ipsilateral ectopic pregnancy after partial salpingectomy. *Taiwan J Obstet Gynecol* 2009; 48: 420-2.
- Tulandi T, Al-Jaroudi D. Interstitial pregnancy: results generated from the society of reproductive surgeons registry. *Obstet Gynecol* 2004; 103: 47-50.
- Lau S, Tulandi T. Conservative medical and surgical management of interstitial ectopic pregnancy. *Fertil Steril* 1999; 72: 207-15.
- Vicino M, Loverro G, Resta L, Bettocchi S, Vimercati A, & Selvaggi L. Laparoscopic cornual excision in a viable large interstitial pregnancy without blood flow detected by color Doppler ultrasonography. *Fertil Steril* 2000; 74: 407-9.
- Dilbaz S, Katas B, Demir B, & Dilbaz B. Treating cornual ectopic pregnancy with a single methotrexate injection. *J Reprod Med* 2005; 50: 141-143.
- Fleischer AC, Pennell RG, McKee MS, et al. Ectopic pregnancy: features at transvaginal sonography. *Radiology* 1990; 174: 375-8.
- Ackerman TE, Levi CS, Dashefsky SM, et al. Interstitial line: sonographic finding in interstitial (cornual) ectopic pregnancy. *Radiology* 1993; 189: 83-7.
- Auslender R, Arodi J, Pascal B, et al. Interstitial pregnancy: early diagnosis by ultrasonography. *Am J Obstet Gynecol* 1983; 146: 717-8.
- Valsky DV, Hamani Y, Verstandig A, Yagel S. The use of 3D rendering, VCI-C, 3D power Doppler and B-flow in the evaluation of interstitial pregnancy with arteriovenous malformation treated by selective uterine artery embolization. *Ultrasound Obstet Gynecol* 2007; 29: 352-5.
- Timor-Tritsch IE, Monteagudo A, Matera C, Veit CR. Sonographic evolution of interstitial pregnancy treated without surgery. *Obstet Gynecol* 1992; 79: 1044-9.
- Batioğlu S, Haberal A, Yeşilyurt H, Ekici E. Successful treatment of cornual pregnancy by local injection of methotrexate under laparoscopic and transvaginal ultrasonographic guidance. *Gynecol Obstet Invest* 1997; 4: 64-6.
- Park HR, Moon MJ, Ahn EH, Baek MJ, Choi DH. Heterotopic quadruplet pregnancy: conservative management with ultrasonographically-guided KCl injection of cornual pregnancy and laparoscopic operation of tubal pregnancy. *Fetal Diagn Ther* 2009; 6: 227-30.
- Cai Z, Wang F, Cao H, Xia Q, Chen X, Cai Y. The value of laparoscopy alone or combined with hysteroscopy in the treatment of interstitial pregnancy: analysis of 22 cases. *Arch Gynecol Obstet* 2012; 285: 727-32.
- Takeda A, Koyama K, Imoto S, Mori M, Sakai K, Nakamura H. Successful management of interstitial pregnancy with fetal cardiac activity by laparoscopic-assisted cornual resection with preoperative transcatheter uterine artery embolization. *Arch Gynecol Obstet* 2009; 280: 305-8.
- Deruelle P, Lucot JP, Lions C, Robert Y. Management of interstitial pregnancy using selective uterine artery embolization. *Obstet Gynecol* 2005; 106: 1165-7.
- Gezer A, Mutlu H. Laparoscopic management of cornual pregnancy without sutures. *Arch Gynecol Obstet* 2004; 207: 194-6.

腹腔鏡輸卵管全切除手術後自然發生同側輸卵管間質部異位妊娠：案例報告及文獻回顧

汪文生* 魏添勇 高衡峰

童綜合醫院 婦產部

受文日期：民國 102 年 12 月 2 日；接受刊載：民國 103 年 2 月 11 日

摘要

輸卵管全切除手術後發生同側輸卵管間質部異位妊娠極為罕見，當輸卵管全切除手術後，懷孕時仍需注意妊娠著床的位置是否正確，有可能發生同側輸卵管間質部異位妊娠。本案例報告輸卵管妊娠破裂接受腹腔鏡輸卵管全切除手術三個月後，自然發生同側輸卵管間質部異位妊娠。由於同側再發性輸卵管間質部異位妊娠的診斷及處置相對困難，因此死亡風險較其他異位妊娠高，所以應對這類病患緊密監視妊娠情況，以免延誤輸卵管間質部異位妊娠的診斷及治療。

關鍵詞：間質部妊娠、異位妊娠、輸卵管全切除手術

Case Report

Complete Obstruction of the Femoral Artery in Pubic-type Traumatic Anterior Hip Dislocation: a case report

Chen-Shun Huang*, Shao-keh Hsu, Hsueh-Ming Chen

Department of Orthopedic Surgery, Tungs' Taichung MetroHarbor Hospital, Taichung, Taiwan

Received: Mar. 25, 2014; Accepted: Jun. 30, 2014

Abstract

The incidence of traumatic hip dislocation has increased in recent years as a result of high-energy trauma such as high-speed motor vehicle accidents or falls from great heights. Anterior hip dislocations represent less than 10–15% of all traumatic hip dislocations and are more common in younger adults. Only a few case reports describe anterior hip dislocation with vascular injury or complete obstruction of the femoral artery, which is usually associated with other soft tissue and bony injuries. We report a case

of successful closed reduction of pubic-type traumatic anterior hip dislocation with complete obstruction of the femoral artery, followed up for 8 years. Owing to prophylactic heparin treatment, the patient experienced no pulmonary embolism or deep vein thrombosis during the hospital course. There was no evidence of femoral head avascular necrosis and traumatic arthritis, but there was a large heterotopic calcification at the right lateral hip joint.

Key words: Anterior, hip dislocation, vascular injury

Introduction

Traumatic hip dislocations result from high-energy trauma. These dislocations are usually posterior in 90% of the cases and are usually associated with other soft tissue and bony injuries^[3,9]. Anterior dislocations of the inferior type are usually less common^[6,10].

Anterior dislocations of the hip are classified to be of the obturator, pubic, or perineal types^[4].

Pubic superior anterior hip dislocation accounts for less than 10% of the anterior hip dislocations^[1,5]. Vascular injury is more common in anterior hip dislocations in most series^[5]. Only a few case reports describe anterior hip dislocation along with complete obstruction of the femoral artery.

Case report

A 28-year-old obese male sustained an injury when he fell off his motorcycle in a traffic accident on May 7, 2005. On examination, the right lower limb was grossly shortened and fixed in external rotation and abduction. The entire right lower limb was pulseless, cold, and cyanosed. The right anterior chest wall, axillary regions, and right hand had deep maceration wounds. There was loss of sensation and motor movement in the right upper and lower limbs.

Imaging studies including radiographic examination of the anteroposterior view of pelvis, chest, and right hand showed right hip anterior superior dislocation (Figure 1), right first and second metacarpal open comminuted fractures, and left pneumothorax. Lower limb angiography showed complete obstruction of the right femoral artery at the right hip joint level (Figure 2). These examinations were completed within two hours after the patient arrived in the emergency room. Urgent left chest incubation was

*Correspondence to: Chen-Shun Huang, Department of Orthopedic Surgery, Tungs' Taichung, MetroHarbor Hospital, No.699, Sec. 8, Taiwan Blvd., Wuqi Dist., Taichung City 435, Taiwan (R.O.C.)

performed at the emergency department. Three hours after the injury, the patient had a successful closed reduction for his right hip dislocation under general anesthesia in the operating room. The right leg cyanosis had gradually disappeared, and his pulse became palpable. Wound debridement and open reduction and internal fixation with a Kirschner wire for the right first and second metacarpal open fractures were performed. Wound debridement and repair of right anterior chest and axillary maceration wounds were performed simultaneously.

After surgery, the patient was administered



Fig. 1 Anteroposterior view of pelvis showed right hip anterior superior dislocation.



Fig. 2 The lower limb angiography showed complete obstruction of the right femoral artery at right hip joint level.

heparin, 25000 IU in 500 cc normal saline, and an additional 5000 IU per day for three days, followed by Coumadin, 5 mg qd, for 10 days.

Right lower leg sensation recovered on day 1 after reduction. The patient was able to flex and extend his toes on day 3, and lower limb muscle power recovery to grade 3 was noted on day 7. Upper and lower limb NCV showed right brachial plexus and right sciatic nerve injuries. Right lower limb muscle power showed complete recovery to grade 5 after two months. Right brachial plexus injury also recovered 10 months after physiotherapy. There was no pulmonary embolism or deep vein thrombosis during hospitalization. The patient was followed up for eight years and there was no evidence of femoral head avascular necrosis and traumatic arthritis, but there was a large heterotopic calcification at the right lateral hip joint (Figure 3).

Discussion

The mechanism of anterior hip dislocation is caused by dashboard injury, which is the positioning of the thigh in abduction and external rotation when forces transmitted along the femur force the femoral head out of the hip joint^[5]. The position of the hip determines the type of anterior dislocation. Flexion at the hip joint will result in an obturator- or perineal-type dislocation, whereas an extended position will result in a pubic-type dislocation^[3]. Anterior hip dislocations can be associated with femoral neurovascular injury, femoral head fractures, and acetabulum fractures^[6,10,21].



Fig. 3 8 year after dislocation anteroposterior view of pelvis showed large heterotopic calcification at right lateral hip joint

Table 1. Nomograms for adjusting Heparin Drip Rates:
Adult Heparin Drip Protocol

INDICATION	WEIGHT	LOADING DOSE	INITIAL INFUSION RATE	NOTES
Deep Venous Thrombosis (DVT) Pulmonary Embolism (PE) Arterial Embolism	≤125kg	80 units/kg IV (rounded to nearest 1000 units)	18 units/kg/hour	
Deep Venous Thrombosis (DVT) Pulmonary Embolism (PE) Arterial Embolism	> 125kg	10,000 units IV	2250 units/hr divided by weight (kg) = units/kg/hr	1. Maximum Loading Dose = 10,000 units 2. Maximum initial rate = 2250 units/hr

POST-OP AND TRAUMA PATIENTS: Goal PTT 60-79 seconds

PTT	Rebolus or Hold	Rate Adjustment	Recheck PTT
≤ 59	NONE	↑ 1 units/kg/hr	6hrs
GOAL 60-79	NONE	NONE	In AM
80-90	NONE	↓ 0.5 units/kg/hr	6hrs
91-100	NONE	↓ 1 units/kg/hr	6hrs
101-109	HOLD 60 minutes	↓ 2 units/kg/hr	6hrs
> 110	HOLD 60 minutes	↓ 3 units/kg/hr	6hrs

Femoral artery obstruction can be caused by vascular compression between the femoral head and inguinal ligament in anterior superior hip dislocation or direct injury, which can cause transection of the artery or vein or occlusion by a thrombus, especially in associated acetabulum fractures. Closed maneuvers are usually effective in reducing fresh dislocations. If this measure fails, open reduction is necessary. Primary closed reduction of dislocation with conservative management is effective in most cases with vascular compression. After closed reduction one should listen for bruit over the femoral vessel in the groin. If it is present, angulation and compression of the femoral artery should be suspected. Rapid swelling of the limb may indicate femoral venous obstruction, which may require vascular repair or removal of a thrombus^[23].

The prognosis of hip dislocation becomes worse with the increasing severity of the injury, the degree of compounding, associated soft tissue (including vascular) injuries, the age of the patient, and delay in reduction^[8,11,12,18,21,24].

Acute complications in vascular injury include pulmonary embolism and deep vein thrombosis. Late complications include recurrent dislocations, osteonecrosis of the femoral head, heterotopic calcification, and post-traumatic arthritis. Sciatic nerve

injury on presentation has been reported in as high as 16–20% of the cases. Deep vein thrombosis and deep infection are other complications associated with acetabulum fracture^[12]. Sciatic nerve injury is usually neuropraxia.

In case of an arterial injury or complete obstruction of the femoral artery, the critical time for restoration of circulation and limb salvage has been established to be six to eight hours^[7]. Beyond eight hours, the proportion of patients requiring amputation is 86% or greater^[14]. Factors contributing to the outcome of anterior hip dislocation with vascular injury include ischemic time, time of reduction, age of patient, associated severity of surrounding tissue injury and fracture, open reduction and arterial repair, diabetes, and obesity^[2,8,11,12,18,21,24]. Post-operative use of anticoagulant therapy is recommended to prevent pulmonary embolism and deep vein thrombosis but it may precipitate bleeding in associated injuries. Use of a nomogram (Figure 4) for adjusting the heparin dose and monitoring daily CBC, PTT, platelets, and bleeding of the patient is recommended to reduce bleeding from other associated injuries^[10,16]. We can immediately perform angiographic examination in the emergency department because we have a radiologist on standby.

Conclusion

Hip dislocations with complete obstruction of the femoral artery are considered orthopedic emergencies. Prompt closed reduction should be performed. Although it is usually successful, one should not hesitate to perform an open reduction. If a pulseless extremity is encountered, angiographic examination and arterial or venous repair to remove the occlusive thrombus are necessary. The amputation rate in a pulseless extremity increases with ischemic time. The use of anticoagulant agents can prevent pulmonary embolism and deep vein thrombosis, but CBC, PTT, platelets, and bleeding of the patient should be carefully monitored daily.

References

1. Manish CHADHA, Anil AGRWAL, Arun Pal SINGH, Traumatic anterior dislocation of the hip joint with posterior acetabular wall fracture. *Acta Orthop. Belg* 2005; 71: 111-114.
2. Ginger E. Holt, MD, and Eric C. McCarty. Anterior Hip Dislocation with an Associated Vascular Injury Requiring Amputation *MD J Trauma* 2003; 55: 135-138.
3. Epstein HC, Harvey JP. Traumatic anterior dislocation of the hip: management and results. *J Bone Joint Surg Am* 1972; 54: 1561-1570.
4. Epstein HC. Traumatic dislocations of the hip. *ClinOrthop* 1973; 92: 116-142.
5. Epstein HC, Wiss DA. Traumatic anterior dislocation of the hip. *Orthopaedics* 1985; 8: 130-134.
6. Erb RE, Steele JR, Nance EP, et al. Traumatic anterior dislocation of the hip: spectrum of plain and CT findings. *Am J Roentgenol* 1995; 165: 1215-1219.
7. Green NE, Allen BL. Vascular injuries associated with dislocation of the knee. *J Bone Joint Surg Am* 1977; 59: 235-239.
8. Grundy M, Kumar N. Open anterior dislocation of the hip. *Injury* 1982; 13: 315-316.
9. Jacobs JR, Rao JP, Ciccarelli C. Traumatic dislocations and fracture dislocations of the hip. *ClinOrthop* 1987; 249-263.
10. Khan SA, Sadiq SA, Abbas M, et al. Open anterior dislocation of the hip in a child. *J Trauma* 2001; 51: 773-776.
11. Lamberti PM, Rabin SI. Open anterior-inferior hip dislocation. *J Orthop Trauma* 2003; 17(1): 65-66.
12. Lim LT. Popliteal artery trauma: 31 consecutive cases without amputation. *Arch Surg* 1980; 115: 1307-1313.
13. Miller HH, Welch CS. Quantitative studies on the time factors in arterial injuries. *Ann Surg* 1949; 130: 428-438.
14. Moorman CT 3rd, Warren RF, Hershman EB, Crowe JF, Potter HG, Barnes R, et al. Traumatic posterior hip subluxation in American football. *J Bone Joint Surg Am* 2003; 85: 1190-1196.
15. Patman RD, Thompson JE. Fasciotomy in peripheral vascular surgery. *Arch Surg* 1970; 101: 663-672.
16. Rafai M, Ouarab M, Largab A, et al. Open post-traumatic anterior luxation of the hip in children. *Rev ChirOrthopReparatriceAppar Mot* 1995; 81: 178-181.
17. Roberts RM, String ST. Arterial injuries in extremity shotgun wounds: requisite factors for successful management. *Surgery* 1984; 96: 902-908.
18. Rush DS. Does open fasciotomy contribute to morbidity and mortality after acute lower extremity ischemia and revascularization? *J Vasc Surg* 1984; 10: 343-350.
19. Schwartz D, Haller J. Open anterior hip dislocation with femoral vessel laceration. *J Trauma* 1974; 14: 1054-1056.
20. Tackett AD, Sale WG. Vascular injuries to the extremities. *Am Surg* 1977; 43: 488-496.
21. U. K. Sathoo, G. S. Tucker, Aditya V. Maheshwari, A. Kaul. Open anterior fracture dislocation of the hip: a case report and review of literature. *Arch OrthopTrauma Surg* 2005; 125: 550-554.
22. Hirsh, J. Parenteral Anticoagulants. *American College of Chest Physicians Evidence Based Clinical Practice Guidelines* 2008; 141-159.
23. Nutescu, E. Heparin, Low Molecular Weight Heparin, and Fondaparinux. In *Managing Anticoagulation Patients in the Hospital: The Inpatient Anticoagulation Service*. Bethesda: American Society of Health-System Pharmacists 2007; 177-196.

外傷性髖關節前上方脫臼合併神經血管損傷之病例報告

黃清順* 徐少克 陳學明

童綜合醫院 骨科部

受文日期：民國 103 年 3 月 25 日；接受刊載：民國 103 年 6 月 30 日

摘要

近年來外傷性髖脫臼的發生率增加，是因為高速外力引起的外傷，像是高速車禍或是從高處摔落下來所造成。前方髖關節脫臼占全部髖關節脫臼的百分之十至十五。大多發生在年輕人，但是只有少數病例報告關於髖關節前方脫臼合併有血管損傷，這些病例經常合併有其他軟組織和骨骼損傷。

關鍵詞：髖脫臼、血管損傷

Case Report

Successful Non-surgical Management of Small Bowel Perforation Caused by Fish Bone Ingestion: A case report

Mao-Yu Huang¹, Yen-Lin Chen², Po-Jen Hsaio¹, Yoiu-Wen Cheng^{1,*}

¹Department of Internal Medicine, ²Department of Radiology, Taoyuan Armed Forces General Hospital, Taoyuan County, Taiwan

Received: Apr. 2, 2014; Accepted: May. 28, 2014

Abstract

Foreign body ingestion is commonly encountered in clinical practice, with most passing through the gastrointestinal tract without any consequence. In patients with ingested foreign bodies, gastrointestinal tract perforation is rare, occurring in <1% cases. Fish bones are one of the most common ingested objects that perforate the bowel. Most patients with bowel perforation caused by fish bone ingestion require surgical intervention. Here we present the case of a 52-year-old woman who presented with fever and abdominal pain in the lower right quadrant since 6 h. The diagnosis was confirmed using multidetector computed tomography that revealed a fish bone embedded in the distal ileum, along with a history of fish ingestion as recalled by the patient. Medical treatment, instead of surgical intervention, was selected to manage the patient's condition. During hospitalization, her clinical condition did not improve. A follow-up abdominal CT scan revealed migration of the fish bone to the colon. Perforation of the distal ileum was not observed. The patient was successfully treated by non-surgical management without any complications. A literature review further supported the use of medical treatment instead of surgical intervention in carefully selected cases.

Key words: Foreign body ingestion, Small bowel perforation, Fish bone, Distal ileum, Non-surgical management

Introduction

Small bowel perforation can be caused by traumatic, inflammatory, ischemic, or neoplastic etiologies^[1]. Ingested foreign bodies rarely cause gastrointestinal tract perforation as most pass through uneventfully within a week^[2]. However, long, hard, or sharp objects such as fish and chicken bones and toothpicks can result in perforation^[2-4]. Most cases are accidental and are commonly noted in children; the elderly; and patients with dentures, mental retardation, or those abusing alcohol. In Hong Kong, fish bones are one of the most common ingested foreign bodies leading to gastrointestinal tract perforation^[5].

Gastrointestinal tract perforation caused by fish

bones has diverse clinical manifestations, including abdominal pain (95%), fever (81%), and localized peritonitis (39%)^[6]. Other symptoms that may occur are nausea, vomiting, hematochezia, and melena; however, these symptoms are usually nonspecific. Thus, accurate preoperative diagnosis depends on the similarity in their presentation to other conditions such as appendicitis, cecal diverticulitis, inflammatory bowel disease, and Meckel diverticulitis. Several reports have described perforation of the bowel wall caused by fish bones that warranted surgical intervention for bone removal^[4,6-8]. This report illustrates a rare case of small bowel perforation caused by an ingested fish bone that was successfully managed non-surgically without any complications.

Case Report

A 52-year-old woman presented to our emergency department with dull abdominal pain in the

*Correspondence to: Yoiu-Wen Cheng, MD
Division of Gastroenterology, Department of Internal Medicine,
Taoyuan Armed Forces General Hospital, No.168, Jhongsing
Road, Longtan Township 32551, Taoyuan County, Taiwan
(R.O.C.)

lower right quadrant since 6 h. On arrival at the emergency department, she was alert and oriented. She appeared acutely ill but had no nausea, vomiting, shortness of breath, or diarrhea. She was febrile and tachycardic, with vital signs as follows: body temperature, 38.5°C; heart rate, 110 beats/min; blood pressure, 139/72 mmHg; and respiratory rate, 18 breaths/min. The initial physical examination revealed normal breath sounds and regular heart beat without murmur. The abdominal pain was initially generalized, but later localized to the lower right quadrant, worsening in intensity. She reported no melena or hematochezia. Her medical history included type 2 diabetes mellitus. She had previously undergone surgery for an ectopic pregnancy.

Abdominal examination showed localized tenderness in the lower right quadrant with rebound pain and voluntary guarding. Physical examination revealed rebound tenderness and abdominal guarding. The abdomen appeared grossly normal, with no shifting dullness, pulsatile mass, hepatosplenomegaly, or ascites. Bilateral examination revealed no hernia. Laboratory tests indicated a white blood cell count of 8710/ μ L, with 82.0% neutrophils and 12.5% lymphocytes; the concentration of C-reactive protein was 0.67 mg/dL. Urinalysis was normal, and other laboratory data were within normal limits.

A standard X-ray of the abdomen showed local ileus in the lower right abdomen and no subdiaphragmatic air. After primary medical treatment with intravenous ketoprofen (30 mg) and Hyoscine-N-Butyl bromide (20 mg), the abdominal pain in the lower right quadrant was still noted. Abdominal multidetector computed tomography (MDCT) showed a 20-mm, curvilinear, calcified, hyperdense lesion embedded in the distal ileum. The bowel wall was thickened, with a punctiform perforation (Fig. 1). There was no pneumoperitoneal abscess or pelvic fluid collection. Moreover, the appendix appeared normal. No evidence of diverticular disease was observed. The patient then recalled that she had eaten fish the previous day. Suspecting perforation of the distal ileum caused by a fish bone, a general surgeon was consulted. Abdominal CT was suggestive of microperforation as there was no free air, local abscesses, or fat stranding in surrounding tissues. This diagnosis was further supported by the patient's relatively stable clinical condition. Medical treatment, instead of surgical intervention, was selected for managing the patient's condition.

After admission to the ward, the patient received intravenous saline hydration without oral intake. Antibiotics (cefoxitin, 2 g every 8 h) were prescribed. During the first 5 days after admission, spiking fever and local tenderness in the lower right quadrant were still noted. Repeated blood analysis showed that the level of C-reactive protein was 0.80 mg/dL. A follow-up abdominal CT was thus performed on the sixth day; results revealed a radiopaque curvilinear object in the splenic flexure of the colon loops (Fig. 2). The fish bone had rotated and migrated to the colon. The previously noted perforation in the distal ileum was no longer



Fig. 1 Abdominal CT image revealed perforated distal ileum by a 20 mm curvilinear calcified hyperdense lesion (white arrow) with focal thickened wall and localized fat stranding without apparent pneumoperitoneum or fluid collection.

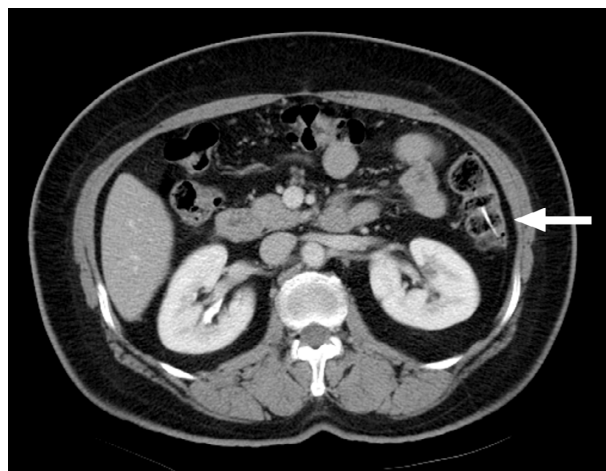


Fig. 2 Follow-up abdominal CT image, which demonstrated the radiopaque curvilinear object in the splenic flexure of colon loops. (white arrow)

visible. No pneumoperitoneum, associated bowel obstruction, or abscess was observed. Therefore, medical treatment was continued without surgical intervention. On the seventh hospital day, the patient felt hungry and experienced less abdominal pain and tenderness. In addition, the fever had subsided. Laboratory tests indicated no leukocytosis or left shift in the hemogram. Considering the improvement in her clinical condition, an oral soft diet was prescribed. She was tolerant of the diet without any exacerbation of symptoms. The recovery was uneventful and she was discharged on the tenth hospital day with normal oral intake and stool passage.

Discussion

Foreign body ingestion is a common occurrence. Most foreign bodies uneventfully pass through the gastrointestinal tract without any consequence within a week; however, in <1% cases, bowel perforation occurs^[2]. Perforation can occur in any segment of the gastrointestinal tract, but it is commonly observed in regions of acute angulation or physiological narrowing such as the distal ileum and ileocecal and rectosigmoid junctions. The distal ileum is the most common site of perforation^[6], leading to local infection or abscesses, generalized peritonitis, or even death^[7].

Surgical intervention is the most common treatment for gastrointestinal tract perforation^[9,10]. Laparoscopy can be safely used in appropriately selected patients^[11-13]. In recent years, laparoscopy has been successfully used for intraperitoneal and intraluminal foreign body removal. It is less invasive

than laparotomy; thus, it can be a good alternative for fish bone removal. Hur *et al.*^[14] reported two cases of peritonitis caused by sharp bones perforating the intestinal tract; these bones were successfully removed using laparoscopy. Surgical treatment involves removal of the fish bone and peritoneal lavage. Appropriate surgical intervention is selected according to the anatomical location of the perforation or other clinicopathological findings and includes primary suture of the perforated bowel segment, bowel resection, and the Hartmann procedure^[6,7,10]. Treatment selection depends on the symptoms and underlying health conditions of the patient, nature and type of fish bones, anatomical location and size of the perforation, and time between rupture and diagnosis. Management can involve either conservative or interventional methods, including endoscopic, laparoscopic, or open surgery.

Conservative treatment of gastric and esophageal perforations was recently reported^[15-19]. Two previously documented cases of hepatic abscesses secondary to fish bone perforation were successfully treated with medical therapy, as surgery was contraindicated^[20,21]. Reported complications of migrated fish bones include retropharyngeal abscesses^[22], gastric submucosal mass^[18], pancreatitis^[23], and liver abscesses^[20,21]. Furthermore, if imaging findings are benign and signs and symptoms have resolved, non-surgical management of the perforation is a feasible alternative. Coulier *et al.* presented two cases of intestinal perforation caused by fish bone that was managed non-surgically on the basis of CT findings, including the absence of peritoneal effusion, abscesses, or pneumoperitoneum^[24]. Review of the

Table 1. bowel perforations managed non-operatively

Authors	Sex / Age	Underlying disease	Previously abdominal operation	Clinical presentations	Size / Location	CT features:	
						Abscess	Peritoneal effusion
Coulier B ^[24] et al.	M / 61	NA	NA	Diffuse pain	NA/ cecum	Nil	Nil
	M / 80	NA	NA	Epigastric pain	NA/ Distal ileum	Nil	Nil
CC Kuo ^[25] et al.	M / 44	Nil.	Nil.	Febrile, RLQ pain 3 h	26mm / Distal ileum	Nil	Nil
Ward MA ^[26] et al.	M / 28	Nil.	Nil.	Afebrile, RLQ pain 4 h	15mm / Distal ileum	Nil	Nil
Our pateint	F / 52	type 2 DM	ectopic pregnancy	Febrile, RLQ pain 6 h	20mm / Distal ileum	Nil	Nil

NA: Not available; RLQ: right lower quadrant

recent literature revealed only three case reports describing medical rather than surgical intervention for the treatment of bowel perforation caused by fish bones (Table 1) [25,26].

In the current case, CT findings were benign. Moreover, the follow-up abdominal CT demonstrated no previous perforation of the distal ileum. The fish bone had penetrated the ileum wall; this was a gradual process that could have resolved itself if the bone migrated to the colon. Consequently, non-surgical treatment was selected. The patient's clinical condition improved, with eventual resolution of all symptoms. Her condition was thus successfully managed with conservative treatment during hospitalization.

In conclusion, the diagnosis of perforation of intestinal structures caused by ingested fish bones is challenging; this differential diagnosis should be considered for every patient presenting with acute abdominal pain. A prompt, accurate diagnosis can be made on the basis of a detailed medical history, physical examination, and imaging findings. Perforation of the distal ileum can be non-surgically managed in carefully selected cases.

Acknowledgements

I am deeply indebted to my supervisor Dr. Yoiu-Wen Cheng from the Division of Gastroenterology, Department of Internal Medicine, whose help, stimulating suggestions, and encouragement helped me during the research for and writing of this thesis. I would like to express my gratitude to all those who gave me the opportunity to complete this thesis. In particular, I would like to convey my special thanks to my wife Mona, whose love and patience enabled me to complete this work. The authors would like to thank Enago (www.enago.tw) for the English language review.

Disclosure of interest

The authors declare no conflicts of interest concerning this article.

References

- Zissin R, Osadchy A, Gayer G. Abdominal CT findings in small bowel perforation. *The British Journal of Radiology* 2009; 82: 162-71.
- Goh BK, Tan YM, Lin SE, Chow PK, Cheah FK, Ooi LL, et al. CT in the preoperative diagnosis of fish bone perforation of the gastrointestinal tract. *AJR Am J Roentgenol* 2006; 187: 710-4.
- Noh HM, Chew FS. Small-bowel perforation by a foreign body. *AJR Am J Roentgenol* 1998; 171: 1002.
- Afridi SP, Malik F, Ur-Rahman S, Shamim S, SamoKA. Spectrum of perforation peritonitis in Pakistan: 300 cases Eastern experience. *World J Emerg Surg* 2008; 3: 31.
- Chu KM, Choi HK, Tuen HH, Law SYK, Branicki FJ, Wong J. A prospective randomized trial comparing the use of the flexible gastroscope versus the bronchoscope in the management of foreign body ingestion. *Gastrointest Endosc* 1998; 47: 23-7.
- Goh BK, Chow PK, Quah HM, Ong HS, Eu KW, Ooi LL, et al. Perforation of the gastrointestinal tract secondary to ingestion of foreign bodies. *World J Surg* 2006; 30: 372-7.
- Pinero Madrona A, Fernández Hernández JA, Carrasco Prats M, Riquelme Riquelme J, Parrila Paricio P. Intestinal perforation by foreign bodies. *Eur J Surg* 2000; 166: 307-9.
- Hsu SD, Chan DC, Liu YC. Small-bowel perforation caused by fish bone. *World J Gastroenterol* 2005; 11: 1884-5.
- Lunsford KE, Sudan R. Small Bowel Perforation by a Clinically Unsuspected Fish Bone: Laparoscopic Treatment and Review of Literature. *J Gastrointest Surg* 2012; 16: 218-22.
- Velitchkov NG, Grigorov GI, Losanoff JE, Kjossev KT. Ingested foreign bodies of the gastrointestinal tract: retrospective analysis of 542 cases. *World J Surg* 1996; 20: 1001-5.
- Yamada H, Kondo S, Kamiya J, Nagino M, Miyachi M, Kanai M, et al. Computed tomographic demonstration of a fish bone in abdominal actinomycosis: report of a case. *Surg Today* 2006; 36: 187-9.
- Iannelli A, Siou P, Spinelli R, Andrescu F, Bloch P. Perforation of the ileum due to foreign body treated laparoscopically. *Surg Endosc* 2002; 16: 538.
- Trecca A, Gaj F, Gagliardi G. Our experience with endoscopic repair of large colonoscopic perforations and review of the literature. *Tech Coloproctol* 2008; 12: 315-21.
- Hur H, Song KY, Jung SE, Jeon HM, Park CH. Laparoscopic removal of bone fragment causing localized peritonitis by intestinal perforation: a report of 2 cases. *Surg Laparosc Endosc Percutan Tech* 2009; 19: 241-3.
- Tsalis K, Blouhos K, Kapetanios D, Kontakiotis T, Lazaridis C. Conservative management for an esophageal perforation in a patient presented with delayed diagnosis: a case report. *Cases J* 2009; 2: 164.
- Rosón Rodríguez PJ, López Ortega S, Melgarejo Cordero F, Vázquez Pedreño L, Fernández Castañer A. Safety of conservative treatment of gastric perforation due to fish bone ingestion. *Gastroenterol Hepatol* 2009; 32: 552-6.
- Sng KK, Koh AJ, Tan NC, Tan SM, Tay KH. An Eastern perspective on oesophageal perforation: a high incidence of ingested bones. *ANZ J Surg* 2008; 78: 573-8.
- Koike J, Matsushima M, Teraoka H, Igarashi M, Deguchi R, Suzuki T, et al. A case of submucosal hematoma of the esophagus and stomach, possibly caused by fish bone ingestion. *Tokai J Exp Clin Med* 2010; 35: 46-56.
- Brandão D, Canedo A, Maia M, Ferreira J, Vaz G. Duodenocaval fistula as a result of a fish bone perforation. *J Vasc Surg* 2010; 51: 1276-8.
- Ng CT, Htoo A, Tan SY. Fish bone-induced hepatic abscess: medical treatment. *Singapore Med J* 2011; 52: 56-8.
- Yang CY, Kao JH, Liu KL, Chen SJ. Medical treatment of fish bone-related liver abscess. *Clin Infect Dis* 2005; 41:

- 1689-90.
22. Chung SM, Kim HS, Park EH. Migrating pharyngeal foreign bodies: a series of four cases of saw-toothed fish bones. *Eur Arch Otorhinolaryngol* 2008; 265: 1125-9.
 23. Chiu YH, How CK, Chen JD. Fish bone-induced pancreatitis. *Clin Gastroenterol Hepatol* 2010; 8: 27.
 24. Coulier B, Tancredi MH, Ramboux A. Spiral CT and multi-detector-row CT diagnosis of perforation of the small intestine caused by ingested foreign bodies. *Eur Radiol* 2004; 14: 1918-25.
 25. CC Kuo, TK Jen, CH Wen, Liu CP, Hsiao HS, Liu YC, et al. Medical treatment for a fish bone-induced ileal micro-perforation: A case report. *World J Gastroenterol* 2012; 18: 5994-8.
 26. Ward MA, Tews MC. Small bowel perforation secondary to fish bone ingestion managed non-operatively. *J Emerg Med* 2012; 43: 295-8.

保守治療成功治癒魚刺造成迴腸穿孔 - 病例報告

黃茂裕¹ 陳彥霖² 蕭博仁¹ 鄭幼文^{1,*}

國軍桃園總醫院 ¹內科部 ²放射部

受文日期：民國 103 年 4 月 2 日；接受刊載：民國 103 年 5 月 28 日

摘要

異物誤食是臨床上不少見的情形，然而大部分會順利通過腸胃道，沒有併發症；僅有小於 1% 的病患造成腸穿孔。魚刺是最常導致腸穿孔的物體，且臨床上病徵變化多端，故術前正確的診斷不容易；大部分魚刺導致的腸穿孔，需要手術介入治療。在此篇病例報告中，我們提出一例 52 歲女性，發燒合併腹痛約一天，且前一天有食用魚肉；經電腦斷層確診：魚刺造成遠端迴腸穿孔，然因病患拒絕接受手術介入，而以保守治療；但在住院過程中，臨床症狀並沒有改善，故安排再一次電腦斷層掃描，而發現魚刺已滾動轉移至大腸，另外也沒有看到先前的遠端迴腸穿孔，之後病患整體狀況逐漸改善，成功以保守治療治癒。我們在此做了相關文獻回顧。

關鍵詞：異物食入、小腸穿孔、魚刺、遠端迴腸、保守治療

Case Report

Spontaneous Bladder Rupture of a Female Patient: A Case Report

Siu-San Tse*, Wei-Chun Weng, Min-Che Tung

Division of Urology, Department of Surgery, Tungs' Taichung Metroharbor Hospital

Received: Jun. 12, 2014; Accepted: Sep. 2, 2014

Abstract

Bladder rupture represents one of the most common urologic injuries experienced by trauma patients. Spontaneous rupture is an uncommon condition and is less widely recognized.

We report here a 45-year-old woman without a history of urinary problems. On November 23, 2009, she noted difficulty in voiding that occurred four hours after she drank two glasses of wine and took a nap. In addition, lower abdominal pain aggravated with time.

She visited our Emergency Department early the next morning. Abdominal sonography, KUB, and CT indicated a possible bladder rupture, and a blood test detected mild azotemia. Cystoscopy confirmed the rupture.

Spontaneous bladder rupture is typically caused by acute bladder neck or urethral obstruction that occurs most frequently in males or more commonly from a long-term indwelling catheter. It may also occur in diseases of the bladder. Our patient did not experience any of these conditions. In the present study, we report our management of this patient and review the relevant literature.

Key words: urinary bladder, spontaneous rupture, female, extraperitoneal, alcohol abuse

Introduction

Bladder rupture represents one of the most common urologic injuries experienced by trauma patients and is commonly associated with blunt, penetrating, or iatrogenic injury. We recommend that "spontaneous bladder rupture" be reserved for a type of rupture not associated with trauma. Moreover, spontaneous rupture is an uncommon condition and is less widely recognized. We report here our experience with a woman with spontaneous bladder rupture and review the relevant literature.

Case Report

We report the case of a 45-year-old woman

with no history of voiding problems or surgery. However, she experienced difficulty in voiding, which was accompanied by lower abdominal pain since the afternoon of November 23, 2009. The patient claimed that she urinated at approximately 11:00 that day. During lunch, she drank two glasses of rice wine, took a nap, and awoke at approximately 16:00. She then found it difficult to urinate but was not concerned. Further that evening, she developed lower abdominal pain and difficulty in voiding. The pain aggravated and persisted. Therefore, she visited the Emergency Department (ER) of another hospital at approximately 08:30 on November 24, where she was initially treated and then transferred to our ER at 09:40.

We noted mild fever (37.8°C) and tachycardia (101 bpm). Further physical examination revealed bilateral tenderness over the lower abdominal quadrant and suprapubic area. Laboratory tests revealed leukocytosis with a left shift, abnormal renal function

*Correspondence to: Siu-San Tse, Division of Urology, Department of Surgery, Tungs' Taichung MetroHarbor Hospital, No.699, Sec. 8, Taiwan Blvd., Wuqi Dist., Taichung City 435, Taiwan (R.O.C.)

(creatinine, 1.9 mg/dL), and microscopic hematuria. An abdominal sonogram showed a possible bladder rupture with fluid accumulated outside the bladder (Figs. 1 and 2). Furthermore, abdominal CT revealed extraperitoneal fluid collection with no obvious extravasation of contrast media (Fig. 3). An immediate KUB examination after contrast CT showed a possible bladder rupture and extravasation of contrast media into the extraperitoneal space (Fig. 4).

Cystoscopy confirmed the preliminary diagnosis. The bladder was ruptured at the right anterior lateral wall, and fatty tissue and vessels were noted just outside the ruptured site (Fig. 5). However, the intestine or other intraperitoneal organs were not noted outside the ruptured site. We applied an 18-Fr silicone indwelling Foley catheter, and the patient was discharged on December 2, 2009. Cystography was again performed on December 22 at our OPD (Fig. 6). Because the X-ray confirmed the healing of the ruptured site, the Foley catheter was removed. At present, the woman is regularly followed at our OPD and has not experienced further voiding problems.

Discussion

Spontaneous bladder rupture is uncommon and is usually associated with distension of the bladder, which results from acute bladder neck or urethral obstruction, prostatic obstruction, or stricture. Bladder pathologies, such as tumors, tuberculosis, stones, a diverticulum, or a surgical scar may predispose to bladder rupture. In addition, using an indwelling catheter for a long term commonly causes bladder rupture, but this was not apparently associated with our case.

Spontaneous bladder rupture has also been associated with straining during defecation, micturition, parturition, substance abuse, or alcohol intoxication. Marshall et al. reported only 20 cases of substance abuse-related spontaneous bladder rupture in the literature, and they added two cases^[1]. Several mechanisms of alcohol intoxication increase the risk of bladder rupture. Munshi et al. considered the diuretic effects of alcohol, which causes a significant increase in the volume of urine. Therefore, the bladder would be over distended with an impaired sensorium^[2]. Alcohol may directly aggravate pre-existing prostatic hypertrophy, although it was not a problem for our present patient. Moreover, alcohol

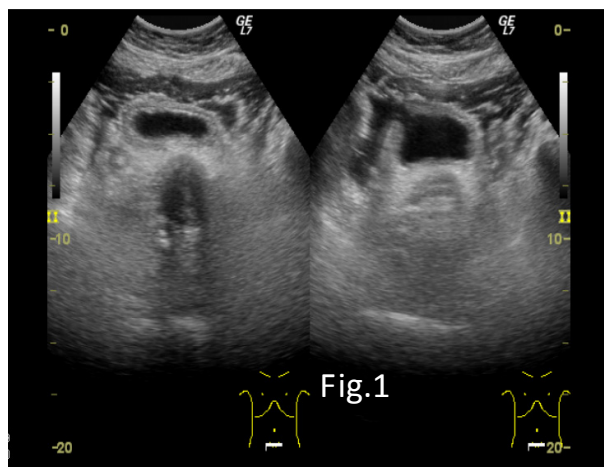


Fig. 1

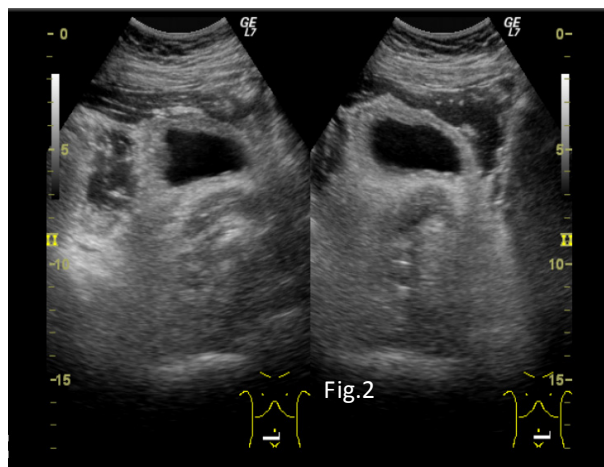


Fig. 2



Fig. 3

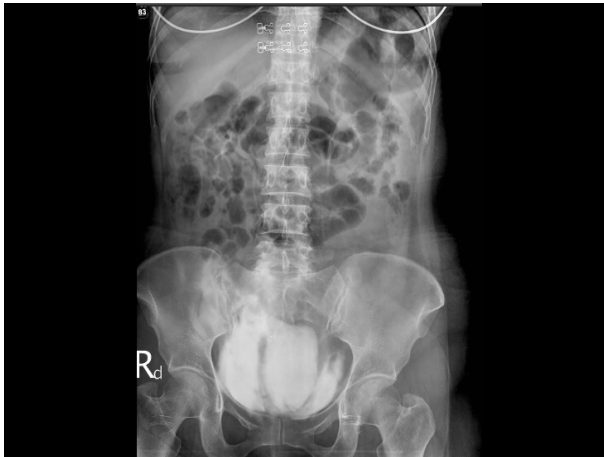


Fig. 4

abuse may induce nausea or vomiting, which would increase intra-abdominal pressure.

Spontaneous intraperitoneal bladder rupture occurs more frequently than extraperitoneal rupture. In 1976, Evans et al. published a literature review of 84 cases of spontaneous ruptures of normal bladders that were all intraperitoneal^[3] because the bladder typically ruptures at its weakest point, i.e., the unsupported peritoneal surface of the dome. This type of rupture causes local signs and symptoms of peritonitis, dysuria, hematuria, and lower urinary tract symptoms. Elevation of BUN and serum creatinine levels occur because of the autodialysis of urinary ascites across the peritoneum. The first case of idiopathic extraperitoneal bladder rupture was reported by McAninch et al. (1991)^[1].

Our patient lacked a history of voiding problems, did not undergo surgery, and did not experience trauma before the rupture. Cystoscopy did not disclose any obvious abnormality of the urethra and bladder. Therefore, we conclude that the rupture was spontaneous and may be associated with alcohol intoxication. The difference between spontaneous bladder rupture in the present case and in other alcoholic patients is that the former was extraperitoneal. However, nearly all the others were intraperitoneal. In managing this case, we treated the patient using catheter drainage alone because there was no other associated morbidity. The largest series on a nonsurgical management of extraperitoneal bladder injuries due to trauma was reported by Corriere et al.^[4] Their series included 39 patients with extraperitoneal bladder injuries managed using catheter drainage, and 87% of patients healed within 10 days.

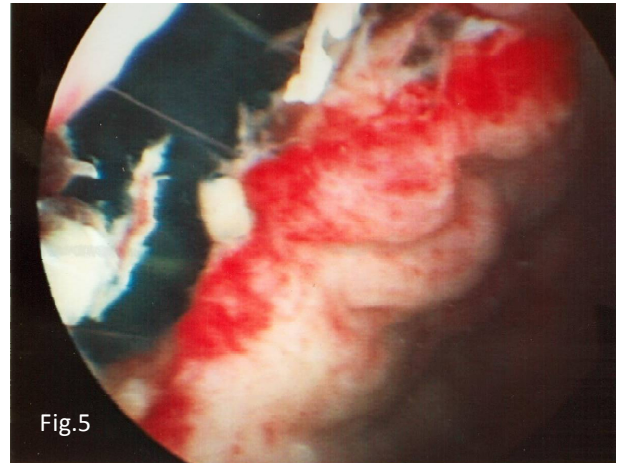


Fig. 5

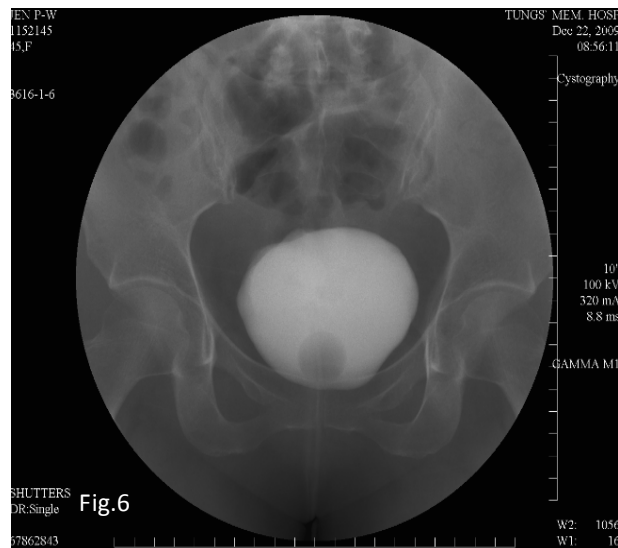


Fig. 6

We also expected that maintaining adequate catheter drainage and using antibiotic prophylaxis may achieve a self-healing of our patient. Further, Kotkin et al. reported that 74% of patients with extraperitoneal bladder rupture caused by blunt trauma spontaneously healed within 10–14 days, although 26% of patients experienced significant complications, including delayed healing, vesicocutaneous fistula, septic events, bladder calculi, or death^[5]. In the present case, the ruptured site had a delayed healing with a Foley catheterization for one month.

If a female patient with no history of trauma presents with dysuria, hematuria, lower abdominal pain, and no urine output for several hours, the possibility of spontaneous bladder rupture should be

considered, particularly when the patient consumed an alcoholic beverage before experiencing symptoms.

References

1. Marshall GA, Dixon CM, McAnich JW. Substance abuse-related spontaneous bladder rupture: report of 2 cases and review of the literature. *J Urol.* 1991;145:135-137.
2. Munshi Imtiaz A, Hong John J, Mueller Cathy M, Barie Philip S. Spontaneous rupture of the urinary bladder in the alcoholic patient. *The Journal of Trauma: Injury, Infection, and Critical Care* 1999;46:1133-1134.
3. Evans RA, Reece RW, Smith MJV. Idiopathic rupture of the bladder. *J Urol.* 1976;116:565.
4. Corriere JN Jr, Sandler CM. Management of the ruptured bladder: Seven years of experience in 111 cases. *J Trauma* 1986;26:830.
5. Kotkin Leonid, Koch Michael O. Morbidity associated with nonoperative management of extraperitoneal bladder injuries. *The Journal of Trauma: Injury, Infection, and Critical Care* 1995;38:895-898.

女性自發性膀胱破裂 - 病例報告

謝肇新* 翁瑋駿 童敏哲

童綜合醫院 外科部 泌尿科

受文日期：民國 103 年 6 月 12 日；接受刊載：民國 103 年 9 月 2 日

摘要

在泌尿系統外傷之病人中，膀胱破裂為非常常見。但自發性膀胱破裂則為非常罕見而不被瞭解。

45 歲女性病患，以前沒有任何小便問題，於 2009 年 11 月 23 日喝了米酒後小睡醒來後發現排尿困難及下腹痛，而且症狀隨時間加劇。

病患於第二天清晨至急診求診，腹部 X-光、超音波及電腦斷層顯示疑似膀胱破裂。血液檢查亦發現腎功能異常，最後以膀胱鏡確立診斷。

自發性膀胱破裂常因急性膀胱出口阻塞或長期導尿管留置有關，亦常見於膀胱有病變之病人，在處理這病人上分享我們的經驗並作文獻回顧。

關鍵詞：膀胱、自發性破裂、女性、腹膜外、酗酒

Case Report

Adrenal Cushing's Syndrome with a High Vanillylmandelic Acid Level: A Case Report and Literature Review

Chang-Ci Chen¹, Cheng-Lin Tsai^{1,*}, Chien-Jung Chang², Ji-Kuen Yu³

¹Division of Endocrinology and ²Metabolism, Division of Cardiology, ³Department of Internal Medicine Division of General Surgery, Department of Surgery, Tungs' Taichung MetroHarbor Hospital, Taiwan

Received: Aug. 27, 2014; Accepted: Nov. 3, 2014

Abstract

Mixed tumors of the cortex and medulla, directly derived from two adrenal germ layers, are extremely rare. We describe a 39-year-old woman with a high concentration of serum cortisol and of 24-h urine vanillylmandelic acid (VMA). This patient visited our Endocrine Clinic because of a weight gain of 6 kg and poor control of hypertension in the past 1 year. Insuppressible cortisol in serum was evaluated by the dexamethasone suppression test. The laboratory test revealed elevated cortisol 32.8 µg/dL (reference range 3–30 µg/dL) and lowered adrenocorticotrophic hormone (ACTH) concentration 5.7 µU/mL (9–52 µU/mL). A well-defined right adrenal tumor (3.1 cm) was detected on computed tomography. Thus, adrenal gland-dependent hyperadrenocorticism was strongly suspected. However, the patient had atypical symptoms, e.g., chest tightness, palpitations, and unusual livedo reticularis over bilateral thighs. Accordingly, we investigated other possible causes of secondary hypertension. The 24-h urine VMA level was high: 18.25 mg/24 h (reference range 1–7.5 mg/24 h), as was norepinephrine concentration in urine: 192 µg/24 h (<97 µg/24 h). Mixed adrenal cortical adenoma and pheochromocytoma were suspected. The patient underwent right robot-assisted laparoscopic adrenalectomy, but histopathological analysis showed only an adrenal cortical adenoma (chromogranin A staining yielded negative results). Although the final findings did not support the preoperative clinical diagnosis and the patient recovered well, we did find some case reports of mixed tumors (pheochromocytoma and adrenal cortical adenoma).

Key words: Cushing's syndrome, vanillylmandelic acid, hyperadrenocorticism, pheochromocytoma

Introduction

In recent years, adrenal tumors have been more successfully detected because of advances in medical imaging, including abdominal ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI). The definition of an adrenal incidentaloma is any adrenal mass discovered using noninvasive abdominal imaging techniques performed for reasons other than a suspected adrenal tumor^[1]. However, adrenal tumor can originate in two adrenal germ layers as a pheochromocytoma in the medulla

and as an adrenal cortical adenoma in the cortex, and these diseases are not rare. However, tumors occupying both the cortex and medulla (corticomedullary adenoma) are relatively rare^[2]. We present clinical, biochemical, histopathological, and imaging features of a case of adrenal Cushing's syndrome, with a high urine level of vanillylmandelic acid (VMA). Previously reported cases are also reviewed.

Case Report

A 39-year-old woman had hypertension for >1 year and took multiple drugs (carvedilol, valsartan/hydrochlorothiazide, amlodipine/atorvastatin, and spironolactone). However, her blood pressure was

*Correspondence to: Cheng-Lin Tsai, Division of Endocrinology and Metabolism, Department of Internal Medicine, Tungs' Taichung MetroHarbor Hospital, Taiwan (R.O.C.)

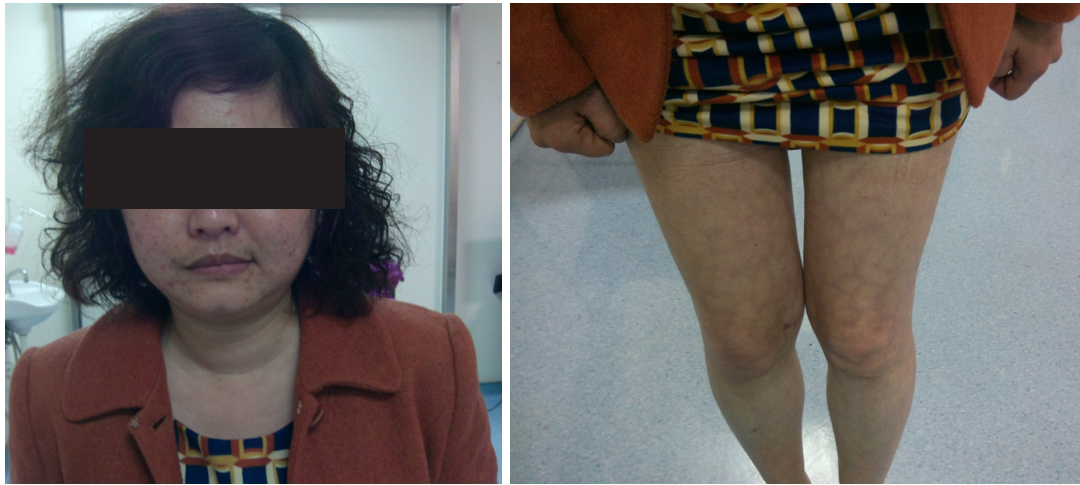


Fig. 1 Patient appearance: moon face, facial acne, wide shoulders, less subcutaneous fat, Livedo skin lesion over lower extremities.

Table 1. Blood test

Preoperative test			
Plasma Renin (PRA) (1.31-3.95 ng/mL/hr)	Aldosterone (3.7-24 ng/dL)	Cortisol, random (μ g/dL)	ACTH (9-52 μ U/mL)
11.89	15.97	32.8	5.7
Postoperative test			
Cortisol, AM (μ g/dL)		ACTH (9-52 μ U/mL)	
3.32		<10	

Table 2. Urine test

Preoperative test		
Urine volume (mL)	VMA (1.0-7.5 mg/24hr)	Urine cortisol (28.5-213.7 μ g/day)
1500	18.24	108
Norepinephrine (<97 μ g/day)	Epinephrine (<27 μ g/day)	Dopamine (<500 μ g/day)
192.3	9.5	304.5
Postoperative test		
Urine volume (mL)	VMA (1.0-7.5 mg/24 hr)	
1660	2.7	

still poorly controlled, with systolic blood pressure often >180 mmHg. In addition, she experienced a weight gain of approximately 6 kg and menstrual irregularities during the past 1 year. Accordingly, she visited our Endocrine Clinic. On physical examination, she had a reddish moon face, facial acne, wide shoulders, low amounts of subcutaneous fat, and livedo reticularis skin lesions over lower extremities (Fig. 1). After review of the medical history and physical

examination findings, Cushing's syndrome had to be considered.

She had high serum cortisol 32.8 μ g/dL (reference range 3–30 μ g/dL) and low adrenocorticotropic hormone (ACTH) concentration 5.7 μ U/mL (reference range 9–52 μ U/mL) (Table 1). Her 24-h urinary cortisol level was 108 μ g/day (reference range 28.5–213.7 μ g/day) (Table 2); however, a 1-mg dexamethasone suppression test revealed nonsuppressible cortisol, with the cortisol level at 20.9 μ g/dL. These results were consistent with Cushing's syndrome.

During follow-up, she experienced unusual headache, palpitations, and very high blood pressure; therefore, we also examined the 24-h urine VMA and catecholamine levels. We found elevated concentrations of VMA 18.25 mg/24 h (reference range 1–7.5 mg/24 h) and norepinephrine 192 μ g/24 h (reference range <97 μ g/24 h). A CT scan showed an approximately 3.1-cm tumor in the right adrenal gland (Fig. 2). According to the aberrant laboratory findings and clinical signs, such as pheochromocytoma, could not be completely excluded. We could not conduct further imaging analyses, such as norcholesterol (NP-59) labeling for an adrenal cortex scan or meta-iodobenzylguanidine (MIBG) labeling, for a medulla scan. After discussion with the patient, we were able to control her blood pressure with an α -blocker (doxazosin) for 2 weeks before the surgical removal of the right adrenal gland (Fig. 3).

The postoperative pathology report revealed an adrenocortical adenoma and no evidence of pheochromocytoma (chromogranin A staining yielded

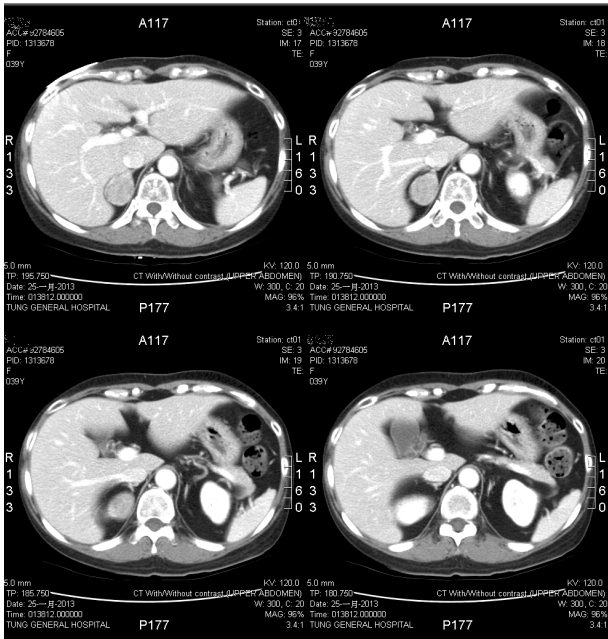


Fig. 2 Computed tomography showing 3.1cm right adrenal well-defined tumor



Fig. 3 Right adrenal gland and tumor post adrenalectomy.

negative results). After the operation, her serum cortisol and urinary VMA levels gradually returned to normal. She did not need to take any antihypertension medication, and her weight decreased. However, we treated her with adrenocortical hormone because of previously existing long-term-suppressed ACTH production.

Discussion

Adrenal glands are located above the kidneys, one on each side, and their total weight is only

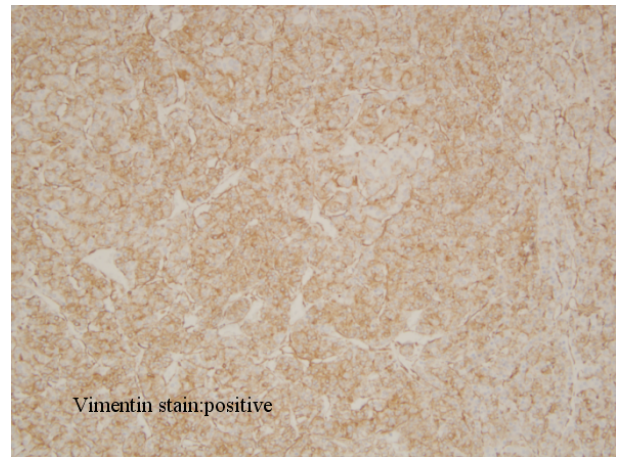
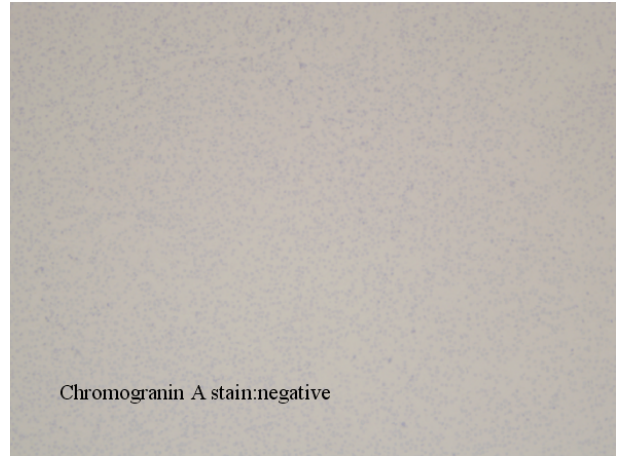
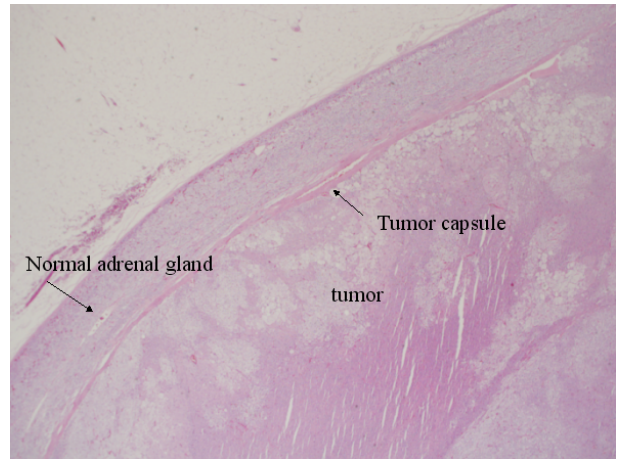


Fig. 4 Adrenal gland, right, adrenalectomy: adrenal cortical adenoma.

approximately 10–15 g. This is similar to that in other endocrine glands, when overactive or insufficiently active adrenal glands cause health problems, e.g., hormonal disorders such as Cushing’s syndrome, Addison’s disease, or pheochromocytoma. Adrenal tumors are not uncommon, particularly in recent

years, in no small part because of the advances in imaging technologies. CT and MRI are widely used, and adrenal incidentalomas are often successfully detected. Once an adrenal tumor is detected, it becomes necessary for further differential diagnosis and evaluation of the possibility of a surgical intervention, particularly in cases of pheochromocytoma. The latter is a functional tumor arising from chromaffin cells. It can spread from the carotid body, ganglia, adrenal medulla, and organ of Zuckerkandl down to the bladder wall. Pheochromocytoma occurred in 10% extra-adrenal tumors, and 10% of patients had a family history, 10% of cases are bilateral, and 10% are malignant. Its signs and symptoms include high blood pressure, headache, palpitations, sweating, anxiety, a weight loss, and glucose tolerance. The preferred treatment is surgical removal of the tumor; therefore, for patients with pheochromocytoma, preoperative preparation and emergency treatment of hypertension are focused on first^[6,8].

Simultaneous adrenal adenoma and pheochromocytoma are rare, particularly in the same adrenal gland. Such a case was first reported in 1969 by Mathison and Waterhouse^[2,4]; they resected adrenal adenomas in a patient with Cushing's syndrome, and the organ was affected by the tumor both in the cortex and medulla (corticomedullary adenoma). In most cases, such coexistence is considered a coincidence. Pheochromocytoma may produce and secrete several regulatory peptides, such as adrenomedullin, somatostatin, neuropeptide Y, and galanin, which can influence production of adrenocortical steroids^[3,7]. In addition, the adrenal medulla may serve as an extrapituitary source of ACTH. After long-term secretion of ACTH, catecholamines and several other peptides may induce formation of an adrenal cortical adenoma. However, it remains difficult to explain why most patients with pheochromocytoma do not develop cortical hyperplasia or adenomas^[3].

In this case, the patient had obvious symptoms of Cushing's syndrome such as a moon face, buffalo hump, weight gain, high blood pressure, menstrual irregularities, and relatively unusual palpitations, headache, and aberrantly high levels of VMA and catecholamines (VMA >11 mg/24 h, >2-fold upregulation of catecholamine levels). The cutaneous signs on the legs are possibly caused by interruption of blood flow in the dermal arteries, due to spasm, inflammation, or

vascular obstruction, and are associated with diseases of varying etiology and severity^[9]. These skin manifestations may also be caused by big fluctuations in her blood pressure. Based on the patient's condition and endocrine test results, pheochromocytoma was considered. MIBG scintigraphy imaging is helpful for analysis of the adrenal medulla^[5]; however, it is not available at our hospital. We used an α -blocker as the first-line treatment for the suspected pheochromocytoma. Although the final pathology report does not support the preoperative diagnosis, this case report and literature review suggest that a merger of two functional endocrine tumors within the same adrenal gland is possible. An NP-59 adrenal scan or an MIBG scan, if available, can be used to classify the parts of a functional tumor in the adrenal medulla or cortex^[2,3,5].

References

1. Hon-Mei Cheng, Sjen-Jung Shen, Chien-Wen Chou, Chwen-Yi Yang, Su-Yu Chen, Wen-Sheng Tzeng, et al. Characteristics of Adrenal Incidentalomas: 5-year Experience in Chi Mei Medical Center. *J Intern Med Taiwan* 2004; 15: 108-114.
2. Wen-Ya Ma, MD, An-Hung Yang, MD, PhD, Yen-Hwa Chang, MD, PhD, Liang-Yu Lin, MD, and Hong-Da Lin, MD. Coexistence of Adrenal Cushing Syndrome and Pheochromocytoma in a "Corticomedullary Adenoma" A Case Report and Review of the Literature. *The Endocrinologist* 2007; 17: 341-345.
3. Wei-Ren Hwang, Wen-Ya Ma, An-Li Tso, Chin-Chen Pan, Yen-Hwa Chang, Hong-Da Lin. Pheochromocytoma and Adrenocortical Adenoma in the Same Gland. *J Chin Med Assoc* 2007; 70(7): 289-293.
4. Mathison DA, Waterhouse CA. Cushing's syndrome with hypertensive crisis and mixed adrenal cortical adenoma-phaeochromocytoma (corticomedullary adenoma). *Am J Med* 1969; 47: 635- 641.
5. Cecile Ghander, Florence Tenenbaum, Frederique Tissier, Stephane Silvera, Dalila Lalej, Bertrand Dousset, et al. When adrenal Cushing's and phaeochromocytoma meet. *Lancet* 2012; 380: 1683.
6. Bravo EL, Tarazi RC, Fouad FM, Textor SC, Gifford Jr RW, Vidt DG. Blood pressure regulation in pheochromocytoma. *Hypertension* 1982 May-Jun; 4: 193-9.
7. Ehrhart-Bornstein M, Hinson JP, Bornstein SR, Scherbaum WA, Vinson GP. Intraadrenal interactions in the regulation of adrenocortical steroidogenesis. *Endocr Rev* 1998; 19: 101-43.
8. Tatiana Mancini, Teresa Porcelli, Andrea Giustina. Treatment of Cushing disease: overview and recent findings. *Therapeutics and Clinical Risk Management* 2010; 6 505-516.
9. Buckley SA, Lessing JN, Mark NM. Livedo reticularis in a patient with pheochromocytoma resolving after adrenal-ectomy. *J Clin Endocrinol Metab* 2013 Feb; 98(2): 439-40.

腎上腺庫欣症候群合併香草扁桃酸偏高 - 病例報告及文獻回顧

陳滄淇¹ 蔡政麟^{1,*} 張建榮² 余積琨³

童綜合醫療社團法人童綜合醫院 ¹內分泌暨新陳代謝科 ²心臟內科 ³外科部

受文日期：民國 103 年 8 月 27 日；接受刊載：民國 103 年 11 月 3 日

摘要

腎上腺可以分為兩個部分，位於外層的稱腎上腺皮質，來自於中胚層，在內層的稱腎上腺髓質，來自於外胚層。大部份的腎上腺腫瘤，均屬無功能的良性腫瘤，但仍有少部份是屬於功能性腫瘤例如皮質醇分泌腺瘤、嗜鉻細胞瘤、原發性多醛酮症等，這些功能性腫瘤都是直接從兩個不同的腎上腺胚層而來，少見皮質和髓質混合病變。我們報告一個 39 歲女性同時有高血清皮質醇和 24 小時尿液高 VMA 的病例，該患者來到內分泌新陳代謝科門診主要是因為在一年內體重增加 6 公斤和控制不良的高血壓，其主要異常數據有過高的皮質醇 (cortisol) 32.8 µg/dL (3-30 µg/dL)，偏低的促腎上腺皮質激素 (ACTH) 5.7 µU/mL (9-52 µU/mL)，患者也接受 1mg dexamethasone 的抑制試驗，但呈現非抑制性 (non-suppression) 的血清皮質醇 20.9 µg/dL (>5 µg/dL 屬非抑制反應)。腹部的電腦斷層呈現右腎上腺 3.1 公分的腫瘤。因此，依賴型高腎上腺皮質功能症是最有可能的。但是，患者有不典型症狀如：胸悶，心悸和不尋常的網狀青斑在雙側大腿。因此，我們調查了其他繼發性高血壓的原因，竟然發現 24 小時尿液中香草扁桃酸 (VMA) 上升到 18.25 mg/24hr (1-7.5 mg/24hr) 和尿液 Norepinephrine 上升到 192 µg/24hr (<97 µg/24hr)，因而懷疑同時有腎上腺皮質腺瘤和嗜鉻細胞瘤。患者接受達文西機械手臂切除右側腎上腺，但病理只顯示腎上腺皮質腺瘤 (嗜鉻染色為陰性)。雖然最終結果並不支持術前臨床診斷，患者於術後也恢復很好，但我們確實發現有嗜鉻細胞瘤和腎上腺皮質腺瘤的混合病變的一些文獻案例報告。

關鍵詞：庫欣症候群、香草扁桃酸、高腎上腺皮質功能症、嗜鉻細胞瘤

Case Report

Cryptococcal Meningitis Presenting as Transient Aphasia

Cheng-Lun Hsiao¹, Shinn-Kuang Lin^{1,2,*}¹Stroke Center and Departments of Neurology, Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation, Taiwan,²School of Medicine, Tzu Chi University, Hualien, Taiwan

Received: Oct. 24, 2014; Accepted: Dec. 2, 2014

Abstract

Cryptococcal meningitis (CM) is one of the most important opportunistic infection and is a major contributor to early mortality in patients with human immunodeficiency virus (HIV). Headache, fever, neck stiffness, and altered mental state are the most frequent clinical findings. Cranial nerve palsies and papilledema have also been reported. However, transient aphasia has never been reported as an initial presentation of CM. The standard therapy for CM is an induction phase of 2 weeks with a combination of the fungicides amphotericin B and flucytosine, prior to consolidation and maintenance therapy with fluconazole. Here we report the unusual case of a 64-year-old woman who had transient aphasia, mimicking a transient ischemic attack, as the initial presentation of CM. The patient refused therapy with amphotericin B and was given daily intravenous fluconazole, 400 mg for 2 weeks, followed by oral daily fluconazole, 450 mg for a total of 6 months. She responded to antifungal therapy well and had a good recovery both clinically and in laboratory studies and she remained healthy at 1-year follow-up. We believe that in this case, transient aphasia was the initial clinical presentation of CM. In an immunocompetent patient with a minor degree of CM, early diagnosis and early monotherapy with fluconazole may yield a good clinical outcome.

Key words: cryptococcal meningitis, transient aphasia, fluconazole

Introduction

Cryptococcal meningitis (CM) is one of the most important opportunistic infection and a major contributor to early mortality in patients with human immunodeficiency virus (HIV), accounting for 13-44% of deaths in HIV-infected cohorts in countries with limited resources^[1]. Despite recent improvements in the diagnosis and treatment of cryptococcosis, CM is responsible for more than 600,000 deaths per year, worldwide^[2]. Unlike in the West, where CM is more commonly observed in immunocompromised patients, a Taiwanese survey reported CM as being more common in HIV-negative patients^[3]. The clinical characteristics of CM have been reported in several studies. Headache, fever, neck stiffness, and altered mental state are the most frequent findings^[4].

Cranial nerve palsies or papilledema have also been reported^[4] and long-term cognitive deficits have been found in CM patients after completion of antifungal treatment^[3]. There is a high alert for symptoms and signs of CM in HIV-infected patient; however, the insidious onset and nonspecific nature of symptoms and signs in immunocompetent patients sometimes leads to a delayed diagnosis.

The standard therapy for CM is a 2-week induction phase with a combination of the fungicides amphotericin B and flucytosine, prior to consolidation and maintenance therapy with fluconazole^[5]. Alternative therapies have also been reported with various effects. Here we report an unusual case of CM in an HIV-negative patient, initially misdiagnosed and treated for a urinary tract infection (UTI). The subsequent development of transient aphasia, mimicking a transient ischemic attack, led to the eventual diagnosis of CM. She recovered well after a 6-month course of fluconazole monotherapy.

*Correspondence to: Shinn-Kuang Lin, MD
Department of Neurology, Taipei Tzu Chi Hospital, No 289, Jian Guo Road, 231, Xindian district, New Taipei City, Taiwan (R.O.C.)

Case Report

A 64-year-old woman had a 10-year history of dysuria and episodic urinary tract infection (UTI) after a lumbar spine operation for spondylosis. Prior to admission, she had a 2-week history of nausea and poor appetite with intermittent low-grade fever, chills, and vomiting four days after the initial nausea. She had concomitant urinary frequency but no dysuria and was diagnosed with another episode of UTI, for which her local practitioner prescribed oral antibiotics. Her symptoms did not improve and she visited our emergency room five days prior to this admission. She was diagnosed as having incomplete treatment of UTI, although urine analysis was normal. She was admitted to a nephrology ward, started on parenteral cefazolin and discharged 3 days later. The chills and vomiting improved, but she continued to have intermittent low-grade fever and nausea. Her daughter noted disturbance in speech on the night of discharge and she was taken to the emergency room again the next day. On examination by a neurologist, there was no impairment of consciousness. She was afebrile, and her neck was supple. The only neurological dysfunction was sensory and partial motor aphasia. She could not understand another person's speech, could only answer questions with a few simple words, and had no spontaneous speech. In addition, she could follow orders using gestures, but could not repeat another person's speech. On FLAIR image, an emergency brain MRI showed a small hyperintense lesion at the left corona radiata suggesting an old infarct (Fig 1). No abnormal signal was found on DW images. She was admitted to the neurological ward. White blood cell count and serum C-reactive protein

(CRP) were within normal range. Meningitis was suspected owing to remittent fever with nausea and vomiting. Spinal tap revealed an elevated intracranial pressure, up to 320 mmH₂O, and a lymphocyte predominant pleocytosis (WBC 139/uL) in the cerebrospinal fluid (CSF) along with decreased glucose (20 mg/dL) and increased protein (171 mg/dL) (Table 1). The immediate CSF acid-fast stain and Indian ink studies were negative. We also sent the CSF sample for studies of tuberculosis polymerase chain reaction, cryptococcal antigen, IgG and IgM of herpes simplex, and varicella zoster viruses. Her aphasia dramatically recovered on the second day of admission on intravenous fluids alone without specific treatment. She was given vancomycin and ceftriaxone under the suspicion of partially treated bacterial meningitis. In addition, she was given intravenous mannitol, 75 ml every 8 h, to treat raised intracranial pressure. The results of both CSF and serum cryptococcal antigen came

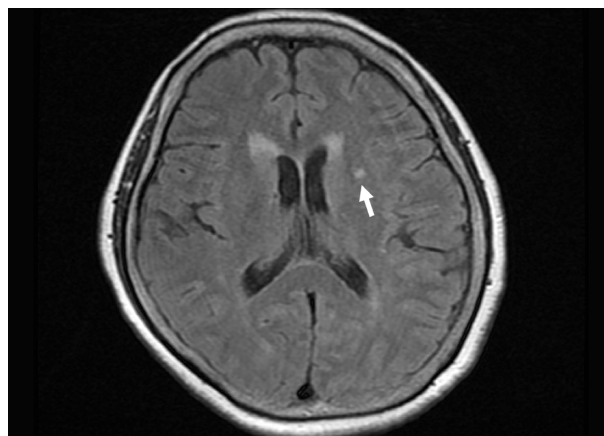


Fig. 1 MRI axial view FLAIR shows a tiny hyperintense lesion in the left corona radiata (arrow).

Table 1. Results of cerebrospinal fluid studies on each occasions.

	admission	1 week	2 week	6 month
Pressure: open/close (mmH ₂ O)	320/100	180/116	96/74	80/70
WBC count (/uL)	139	206	200	2
Lymphocyte (%)	90	73	88	94
Gram Stain	Not found	Not found	Not found	Not found
Indian Stain	Not found	Not found	Not found	Not found
Glucose: CSF/serum (mg/dL)	20/125	19/141	19/136	52/90
Total protein (mg/dL)	172	109	99	53
Cryptococcal antigen	1:8	1:64	1:2	negative
Serum cryptococcal antigen	1:8	1:32	1:16	negative

back as 1:8 and CM was diagnosed. She was found to be HIV-negative. She refused amphotericin B for fear of side effects and was started on intravenous fluconazole, with a loading dose of 800 mg, followed by 400 mg per day and continued mannitol for control of increased intracranial pressure. Thereafter she had no fever, nausea, or vomiting. The other CSF studies were negative. Electroencephalography was normal. We discontinued vancomycin and ceftriaxone, but continued intravenous fluconazole. A follow-up CSF study 1 week later continued to show lymphocytic pleocytosis with low glucose. The titers of cryptococcal antigens of CSF and serum were 1:64 and 1:32, respectively (Table 1). Due to improvement of intracranial pressure, and the development of hypokalemia, possibly related to mannitol use, mannitol was discontinued. The patient was completely asymptomatic after recovery of the aphasia and wanted to be discharged. We continued intravenous fluconazole for 1 more week and performed a third CSF study. The titers of cryptococcal antigens of CSF and serum dropped to 1:2 and 1:16, respectively. She was discharged on oral fluconazole 450 mg daily.

The titer of serum cryptococcal antigen gradually dropped from 1:4 to 1:1 during the following 3 months of outpatient follow-up. After a total 6-month course of oral fluconazole, a fourth study of CSF was normal except for slight elevation of protein. The titers of cryptococcal antigens of both CSF and serum were negative (Table 1). We discontinued fluconazole and the patient remained asymptomatic during follow-up for 1 year to date.

Discussion

The clinical presentation of CM is diverse. Headache, fever, and altered mental state are the most frequent findings reported in HIV-infected patients. Classic meningismus was observed in approximately one-fourth of HIV-infected patients^[6,7]. In Moosa's series, neck stiffness was noted in 90% of HIV-infected cases^[4]. Features reflecting increased intracranial pressure are also common, such as severe headache, reduced level of consciousness, seizures, papilledema, and sixth cranial nerve palsies^[4,6,8]. A higher rate of neurological signs has been reported in immunocompetent patients. The difference in symptomatology between HIV-infected and immunocompetent patients is possible because of a

relatively diminished CSF inflammatory response in HIV-infected patients.^[4,6,8] Although our patient had symptoms of intermittent fever and headache, meningitis was not initially considered as a diagnosis because of the previous history of recurrent UTIs. Further new symptoms of aphasia demanded neurological consultation. Aphasia has seldom been reported as an initial presentation of cryptococcal meningitis. A 40-year-old HIV-positive male in Devi's report had symptoms of right-sided weakness along with progressive aphasia^[9]. However, this case died of heart failure 15 days after admission and there was no further description about his aphasia. Chen et al. studied the neuropsychological sequelae in HIV-negative CM after completion of antifungal treatment^[3]. They found that even with completion of antifungal treatment, CM patients may still have chronic sequelae including depression, impairment in attention, execution, language and speech ability (comprehension and semantic fluency) and visuoconstruction^[3]. To the best of our knowledge, the transient aphasia, mimicking a transient ischemic attack, observed in our patient has never been reported before.

The cause of the transient aphasia was unclear. Transient ischemic changes and epileptic events are thought to be two major mechanisms in the etiology of transient aphasia. Frequent speech arrest has been reported as a manifestation of focal seizure^[10,11]. The electroencephalogram of this patient did not show abnormal discharge during aphasia and the duration of aphasia appeared too long for an epileptic speech arrest. Thus, we supposed that in this case, the transient ischemic change in the left hemisphere was the cause of the transient aphasia. Cerebral infarction secondary to infection is a common complication of chronic meningitis. Lan et al. reviewed 28 patients with cerebral infarction secondary to chronic meningitis, 17 with tuberculosis meningitis, and 11 with CM^[12]. Cerebral infarction accounted for 32% of the complications of CM. The possible mechanisms of cerebral infarction in chronic meningitis are vasculitis with inflammation, spasms, constriction, and eventually thrombosis; necrotizing panarteritis with secondary thrombosis and occlusion; and dilated ventricles stretching the already compromised vessels^[12]. Other possible mechanisms, such as increased platelet aggregations, emboli from foreign material, and infective endocarditis, have also

been reported^[8,13].

The 2010 guidelines for the treatment of CM by the Infectious Diseases Society of America classified patients into three risk groups: (1) HIV-infected individuals, (2) organ transplant recipients, and (3) HIV-negative and nontransplant hosts^[14]. Three key management principles have been implemented: (1) induction therapy for meningoencephalitis using fungicidal regimens, such as a polyene and flucytosine, followed by suppressive regimens using fluconazole; (2) importance of early recognition and treatment of increased intracranial pressure and/or IRIS; (3) the use of lipid formulations of amphotericin B regimens in patients with renal impairment. The 2011 WHO guidelines, for cryptococcal disease in HIV-infected patients, recommended a 2-week induction therapy with amphotericin B plus flucytosine or fluconazole^[15]. When amphotericin B is not available, high dose fluconazole alone may be considered. A recent study found that amphotericin B plus flucytosine, compared with amphotericin B alone, is associated with improved survival among patients with CM^[16]. A survival benefit of amphotericin B plus fluconazole was not found. Some alternative treatments were also described in specific conditions^[2,6,16,17].

Fluconazole monotherapy may be considered when there are limited resources^[5,6]. Yamaguchi et al. reported an 89% clinical response success rate with fluconazole monotherapy, at a dose of 200–400 mg/day in 44 patients without AIDS who had cryptococcosis^[18]. However, a recent study found that mortality and treatment failure in CM following initiation of treatment with 800 mg oral fluconazole is unacceptably high in HIV-infected adults^[5]. Effective control of underlying disease, the fungus load at initial presentation, as evaluated by large numbers of yeast cells on India ink examination, high cryptococcus antigen titer, poor inflammatory response, and mental status on admission may all affect outcome^[19].

Our patient was a non-HIV-infected and nontransplant immunocompetent host. She refused an induction therapy of amphotericin B, owing to the fear of possible complications. We gave her a monotherapy of daily intravenous fluconazole, 400 mg for 2 weeks, followed by oral daily fluconazole, 450 mg for a total of six months. The response to this antifungal regimen was good and she recovered well both clinically and in laboratory studies and remains healthy at 1-year follow-up. We believe that the success of

the fluconazole monotherapy was because of the patient's relatively minor disease severity and early diagnosis and treatment, although she was treated for a UTI initially. The subsequent clinical presentation of aphasia alerted first line physicians to the need for neurology consultation and contributed to the final diagnosis of cryptococcal meningitis.

In conclusion, transient aphasia is an unusual clinical presentation of CM. In an immunocompetent patient with a relatively minor degree of CM, early diagnosis and early monotherapy with fluconazole may yield a good outcome.

Acknowledgement

The study was supported by a grant from the Taipei Tzu Chi Hospital, Buddhist Tzu Chi Medical Foundation (TCRD-TPE-103-RT-16). The authors would like to thank Enago for the English language review.

References

1. Sow D, Tine RC, Sylla K, Djiba M, Ndour CT, Dieng T, et al. Cryptococcal meningitis in Senegal: epidemiology, laboratory findings, therapeutic and outcome of cases diagnosed from 2004 to 2011. *Mycopathologia* 2013; 176: 443-9.
2. Desalermos A, Kourkoumpetis TK, Mylonakis E. Update on the epidemiology and management of cryptococcal meningitis. *Expert Opin Pharmacother* 2012; 13: 783-9.
3. Chen CH, Chang CC, Chang WN, Tsai NW, Lui CC, Lin WC, et al. Neuro-psychological sequelae in HIV-negative cryptococcal meningitis after complete anti-fungal treatment. *Acta Neurol Taiwan* 2012; 21: 8-17.
4. Moosa MY, Coovadia YM. Cryptococcal meningitis in Durban, South Africa: a comparison of clinical features, laboratory findings, and outcome for human immunodeficiency virus (HIV)-positive and HIV-negative patients. *Clin Infect Dis* 1997; 24: 131-4.
5. Rothe C, Sloan DJ, Goodson P, Chikafa J, Mukaka M, Denis B, et al. A prospective longitudinal study of the clinical outcomes from cryptococcal meningitis following treatment induction with 800 mg oral fluconazole in Blantyre, Malawi. *Plos One* 2013; 8: e67311.
6. Jackson A, van der Horst C. New insights in the prevention, diagnosis, and treatment of cryptococcal meningitis. *Curr HIV/AIDS Rep* 2012; 9: 267-77.
7. van der Horst CM, Saag MS, Cloud GA, Hamill RJ, Graybill JR, Sobel JD, et al. Treatment of cryptococcal meningitis associated with the acquired immunodeficiency syndrome. National Institute of Allergy and Infectious Diseases Mycoses Study Group and AIDS Clinical Trials Group. *N Engl J Med* 1997; 337: 15-21.
8. Tjia TL, Yeow YK, Tan CB. Cryptococcal meningitis. *J Neurol Neurosurg Psychiatry* 1985; 48: 853-8.
9. Pushpa Devi, Usha Arora, Aarti Chadha. Cryptococcal meningitis in patients of acquired immunodeficiency syndrome *Journal. JIACM* 2010; 11: 139-40.

10. Peled R, Harnes B, Borovich B, Sharf B. Speech arrest and supplementary motor area seizures. *Neurology* 1984; 34: 110-1.
11. Ogasawara K, Amagasa M, Sato S. A case of frontal lobe epilepsy presenting with recurrent speech arrest. *Brain Nerve* 1992; 44: 1041-5.
12. Lan SH, Chang WN, Lu CH, Lui CC, Chang HW. Cerebral infarction in chronic meningitis: a comparison of tuberculous meningitis and cryptococcal meningitis. *QJM* 2001; 94: 247-53.
13. Leite AG, Vidal JE, Bonasser Filho F, Nogueira RS, Oliveira AC. Cerebral infarction related to cryptococcal meningitis in an HIV-infected patient: case report and literature review. *Braz J Infect Dis* 2004;8:175-9.
14. Perfect JR, Dismukes WE, Dromer F, Goldman DL, Graybill JR, Hamill RJ, et al. Clinical practice guidelines for the management of cryptococcal disease: 2010 update by the infectious diseases society of america. *Clin Infect Dis* 2010; 50: 291-322.
15. World Health Organization. Rapid Advice: Diagnosis, Prevention and Management of Cryptococcal Disease in HIV-Infected Adults, Adolescents and Children. Geneva: World Health Organization, 2011.
16. Day JN, Chau TT, Wolbers M, Mai PP, Dung NT, Mai NH, et al. Combination antifungal therapy for cryptococcal meningitis. *N Engl J Med* 2013; 368: 1291-302.
17. Trpković A, Pekmezović M, Barać A, Crnčević Radović L, Arsić Arsenijević V. In vitro antifungal activities of amphotericin B, 5-fluorocytosine, fluconazole and itraconazole against *Cryptococcus neoformans* isolated from cerebrospinal fluid and blood from patients in Serbia. *J Mycol Med* 2012; 22: 243-8.
18. Yamaguchi H, Ikemoto H, Watanabe K, Ito A, Hara K, Kohno S. Fluconazole monotherapy for cryptococcosis in non-AIDS patients. *Eur J Clin Microbiol Infect Dis* 1996;15:787-92.
19. Shih CC, Chen YC, Chang SC, Luh KT, Hsieh WC. Cryptococcal meningitis in non-HIV-infected patients. *QJM* 2000; 93: 245-51.

以暫時性失語症為表現之隱球菌腦膜炎

蕭振倫¹ 林信光^{1,2,*}

¹台北慈濟醫院 腦中風中心暨神經科

²花蓮慈濟大學 醫學院醫學系

受文日期：民國 103 年 10 月 24 日；接受刊載：民國 103 年 12 月 2 日

摘要

隱球菌腦膜炎對愛滋病患者是最重要的伺機感染之一，也是造成早期死亡的一個主要因素。頭痛、發燒、頸部僵硬、及意識改變是最常見之臨床表現。腦神經麻痺或視乳頭水腫也曾經被提及。但暫時性失語從未被報告為隱球菌腦膜炎的初期表現。對於隱球菌腦膜炎目前之標準治療為將兩性黴素 B (amphotericin B) 合併 5- 氟胞嘧啶 (flucytosine) 投予兩週做為引導治療，之後以氟康唑 (fluconazole) 作為鞏固和維持治療。我們報告一位 64 歲女性隱球菌腦膜炎患者以罕見的類似暫時性腦缺血的暫時性失語症作為初期症狀。病患拒絕接受兩性黴素 B 之治療。我們改以每日靜脈注射 400 毫克氟康唑兩週並接續每日口服 450 毫克氟康唑六個月治療。病患對此抗黴菌治療不論在臨床症狀或是實驗室檢查結果上皆呈現良好的反應，並且在接下來一年內的追蹤都相當健康。暫時性失語症也可能是隱球菌腦膜炎之初始表現。在一位免疫能力正常且疾病輕微之患者，早期診斷並且及早使用氟康唑作為單一治療仍可以有良好之結果。

關鍵詞：隱球菌腦膜炎、暫時性失語症、fluconazole



謹向2014年童綜合醫學雜誌審查者致謝

(依姓氏筆劃排序)

王馨範

金忠孝

周啟文

林柏松

林永崇

邱詠証

洪滿榮

施銘朗

唐仲奇

徐約翰

許弘毅

許兆畬

郭建宏

郭俊逸

陳志銘

陳建民

陳昭惠

曹唐義

張鳴宏

張靖梅

童敏哲

黃三原

黃湘雄

黃鐘銘

曾崇育

鄒順生

楊力衡

楊郁

廖文進

廖培湧

劉嘉耀

遲景上

賴炳村

錢建文

薛冠群

蘇河仰

Instruction to contributors

This journal provides a forum for medical related articles, such as original researches, case reports review articles, communications (includes brief communications), images in clinical medicine, editorial and etcetera. Manuscripts should be submitted to the editorial board of Tungs' Taichung MetroHarbor Hospital Medical Journal:

ADD:No.699, Sec.8, Taiwan Blvd., Wuqi Dist., Taichung City 43503, Taiwan (R.O.C)

E-mail: Tungs_Journal@ms.sltung.com.tw

Submission of Manuscripts:

1. All manuscripts must be in English. The manuscript is required in duplicate (includes an original manuscript and a copy of the original manuscript, however, figures/legends need two original copies) alone with an electronic copy of the latest version; please do not staple the document, if electronic file of figures and/or pictures is being provided, please attached as a JPG format.
2. The content of the document need to be clear, and is consistent with the original copy, the author need to be responsible if the duplicate is different from the original copy or is missing. If the content is related to copyright, author needs to obtain the right to use and is legally responsible for it.
3. Please attached the copyright and consent form on submission. All author(s) listed must actually participate in and agree with the conclusion. Upon receiving and completion of printing, the author(s) will receive 20 free copies and compensation. If extra copy is needed, please notify during editing, and this is subjected to charges.
4. After acquiring consent from the author(s), author(s) agreed to any editing. The submission is returnable, if any, when the manuscript is incompatible with the journal's mission.
5. For any articles listed on the journal, please follow the protocol if related to "the collection of human specimen for research" and "human clinical trail" to ensure the right of participants
6. If the article is related to the use of vertebrates for science application, the project need to be verified by associated animal laboratory management team to ensure the humane management for laboratory animals.

Principles of writing:

1. Original articles should be arranged by the following sequence: abstract, introduction, materials and methods, results, discussion and conclusion, acknowledgements, references, attachments, figures and legends for illustration.
2. Case reports should be arranged by the following sequence: abstract, introduction, clinical records, discussion, references, attachments, table, figures and legends for illustration. Each note should be no longer than 4 pages and should be written with the following order: topic, organization, the name of author(s), past history and critical diagnosis, primary clinical problem, discussion or analysis, conclusion, and references. Patients' eyes should be covered in the picture for privacy. Diagnosis information or the chart of clinical process should be within 6 months.
3. Review articles should aim to provide the reader with a balanced overview of an important and

topical subject in the field. They should cover aspects of a topic in which scientific consensus exists as well as aspects that remain controversial and are the subject of ongoing scientific research. All articles and data sources reviewed should include information about the specific type of study or analysis, population, intervention, exposure, and tests or outcomes. All articles or data sources should be selected systematically for inclusion in the review and critically evaluated.

4. Brief communications should be concise presentations of preliminary experimental results, instrumentation and analytical techniques, or aspects of clinical or experimental practice that are not fully investigated, verified or perfected but which may be of widespread interest or application. Interesting cases with unique features not previously described that make an important teaching point or scientific observation may also be submitted under this article category. The editors reserve the right to decide what constitutes a brief communication.
5. Images in clinical medicine should be arranged by the following sequence: figures and legends for illustration.
6. Editorials are short articles or comments concerning a specific paper in the Journal or a topical issue in the field. Although editorials are normally invited, unsolicited editorials may be submitted and will be given due consideration.
7. Other types of article should be no longer than 3 pages including charts, except for articles with special arrangement.
8. For other details, please refer to international steering committee, for uniform requirements or for manuscripts submitted to biomedical journals please refer to The New England journal of medicine 336:309-315,1997.

Specifications for the different article categories

Article Category	Word count limit		No. of references allowed	No. of tables/ figures allowed
	Abstract	Min text*		
Original Articles	≅300	≅3000	≅40	≅5
Case Reports	≅150	≅1500	≅10	≅3
Review Articles	≅300	≅3500	≅60	≅6
Brief Communications	≅150	≅750	≅7	≅1
Images	≅150	≅500	≅3	≅2
Editorials	≅150	≅2000	≅7	≅1

*Refers to the main body of text only, i.e., does not include article title, abstract, table headings/tables, figure legends and references.

Manuscript preparation:

Manuscript should be double-spaced and numbered pages, and comply with the “uniform requirements for manuscripts submitted to biomedical journals”. The first page is the title page, which include title, name of author(s), organization and unit, contact name, phone number and address (in both Chinese and English). The second and the third page is for abstract (Chinese content needs to consist with English content) and key words (please include 3 to 5 keywords or phrases in Chinese and English), and should be written in paragraphs following by background and purpose, methods, results and discussion.

Co-corresponding author should mention the contributions on manuscript, such as initiation of research topics, the study design, statistical analysis, interpretation of findings, chapters writing involved et al.

Please attach two original copies including attachments, charts and legends. Chart should be professional, with only one figure or one table per page, and is arranged in consecutive orders and numbered in Arabic characters. Table should have a title and appropriate interpretation. Picture should be 5"x 7" in size, black and white, glossy and numbered in consecutive orders of appearance.

Reference:

Unpublished articles or abstracts cannot be listed as references, but could be noted as "unpublished observations". Doctoral dissertation or master thesis can be used. Any articles being accepted by magazines but not published yet, please note the name of magazine, year and note "in press".

Original researches, Case reports, Review articles, Communications (includes brief communications), Images in clinical medicine and Editorials follows the following format:

1. Abbreviations used should follow the format of Index Medicus for all journal titles. When authors are less than 6 people, list all author(s), when more than 6, only list the first 6 followed by "et al" for the rest.
2. References in the text should be placed where relevant. When a reference article is cited, only the primary author is cited; however, if only two authors are present, both should be listed.
3. Example of references:

Examples of Reference:

1. Periodicals:

Yang KTA, Chen HD: A semi-automated method for edge detection in the evaluation of left ventricular function using ECG-gated single-photon emission tomography. Eur J Nucl Med 1994;21:1206-11.

2. Monographs:

Plum F, Posner JB: Diagnosis of Stupor and Coma. 3rd ed. Philadelphia: Davis, 1980:132-3.

3. Monographs with multiple authors:

Levinsky NG: Fluid and electrolytes. In: Thorn GW, Adams RD, Braunwald E, Isselbacher K, Petersdprf RG eds. Harrison's Principles of Internal Medicine, 8th ed. New York: Mcgraw-Hill, 1977:364-75.

Copyright:

If any submission being accepted by Tungs' Taichung MetroHarbor Hospital Medical Journal, the author(s) agree to grant the Medical Journal the right to sublicense the National Central Library or any other database providers to reproduce, transmit publicly by internet, download, print and browse by authorized users. The submission may be changed to meet the requirement of databases.

童綜合醫學雜誌投稿相關規則

95.9.01 製訂
99.08.17 修訂
100.07.11 修訂
102.07.08 修訂
102.12.27 修訂
103.07.14 修訂
103.12.12 修訂

本雜誌刊載與醫學有關之論述，包括原著論文 (Original Articles)、病例報告 (Case Reports)、特別約稿之綜論 (Review Articles)、短論 (Communications、包括 Brief Communications)、影像判讀 (Images)、編著的話 (Editorial)s 等。惠稿請送 43503 臺中市梧棲區臺灣大道八段 699 號童綜合醫學雜誌編審委員會。(E-mail:Tungs_Journal@ms.sltung.com.tw)

壹、投稿前注意事項

1. 惠稿請以英文撰寫，需附原稿兩份（一份原稿和一份複印稿，但圖片應用兩份原圖）並以電腦打字（請以 MS WORD 文書處理格式，中文字型以標楷體，英文字型以 Time New Roman 12 號字大小，稿紙之左右緣為 2.54 公分，上下緣為 3.17 公分），請勿裝訂，同時須提供最後版本之電子檔一份，若圖片或照片有電子檔提供者，請以附檔 jpg 的形式提供。
2. 文件內容需清晰，內容與原稿一致，若複印稿與原稿有差異或遺漏，由作者自行負責。著作中若牽扯到版權所有之內容，作者需取得其使用權，法律責任由作者負責。
3. 投稿同時請附上著作權讓與同意書。所有作者必須實際參與並同意該論述。本院於接受稿件且印刷完成後，將致贈稿酬並贈送 20 份抽印本給通訊作者，如需額外抽印本請於校稿時言明，並酌收成本費用。第一作者若需抽印本可提出申請，依份數酌收成本費用。
4. 本刊對於原稿經徵得著者之同意得伸縮或修改之。如不合本刊宗旨者，得退還之。
5. 凡刊載於本雜誌之著作，若涉及「研究用人體檢體採集」及「人體試驗」等情事，應遵守該注意事項，以落實保障受檢人權益。詳文請參考須附上相關審議認可之文件。
6. 論文中如涉及使用脊椎動物進行科學應用計畫者，應檢附該計畫業經所屬機構動物實驗管理小組審議認可之文件，以落實實驗動物之人道管理。

貳、寫作原則

1. 原著論文 (Original Articles) 按下列順序撰寫：摘要、前言、材料與方法、結果、討論與結論、誌謝、參考文獻、附表、圖片說明、圖片 (含照片)。每篇字數 3000 字以內，摘要 300 字以內，參考文獻 40 篇以內。
2. 病例報告 (Case Reports) 按下列順序撰寫：摘要、前言、病例、討論、參考文獻、附表、圖片說明、附圖、照片。凡病患顏面部位之相片必須遮去眼睛部位，表示尊重隱私。診療資料或臨床經過之圖表，原則上均限六個月以內。每篇字數 1500 字以內，摘要 150 字以內，參考文獻 10 篇以內。
3. 綜論 (Review Articles) 不必按原著論文格式撰寫，但每篇字數 3500 字以內，摘要 300 字以內，參考文獻 60 篇以內。
4. 短論 (Brief Communications)，臨床上、技術上的精簡論著，每篇字數 750 字以內，摘要 150 字以內，參考文獻 7 篇以內。
5. 影像判讀 (Images) 圖例說明每篇字數 500 字以內，摘要 150 字以內，參考文獻 3 篇以內。
6. 編者的話 (Editorials)，每篇字數 2000 字以內，摘要 150 字以內，參考文獻 7 篇以內。

內。

7. 其他細節，請參閱國際指導委員會（International Steering Committee）發表之生物醫學雜誌稿件統一規格（Uniform Requirements for Manuscripts Submitted to Biomedical Journals，見 The New England Journal of Medicine 336:309-315,1997）。
8. 將可接受投稿之稿件種類之摘要字數、字數、參考文獻及圖表相關上限規定，整理於下表：

稿件種類	字數限制		參考文獻	圖 / 表
	摘 要	內文字數		
原著論文 (Original Article)	≤ 300	≤ 3000	≤ 40	≤ 5
病例報告 (Case Report)	≤ 150	≤ 1500	≤ 10	≤ 3
綜論 (Review Article)	≤ 300	≤ 3500	≤ 60	≤ 6
短論 (Brief Communication)	≤ 150	≤ 750	≤ 7	≤ 1
影像判讀 (Images)	≤ 150	≤ 500	≤ 3	≤ 2
編者的話 (Editorial)	≤ 150	≤ 2000	≤ 7	≤ 1

參、投稿須知

1. 稿件須符合「生物醫學雜誌投稿之統一規定」¹，請以電腦隔行 double space 書寫並編頁碼。
2. 第一頁為標題頁，須列出中文及英文之論文題目、中英文作者姓名、所屬機構及單位之中英文稱號（分屬不同單位，請以阿拉伯數字標出作者與單位）、聯絡人姓名、電話及中英文通訊錄。
3. 第二、三頁為中文及英文之摘要及關鍵詞（請提供 3 至 5 個關鍵詞或簡短片語），中英文摘要須完全相同，摘要分段撰寫，依序為背景及目的（Background and purpose）、方法（Methods）、結果（Results）及討論（Discussion）。
4. 相同貢獻作者請加註說明，如研究主題的設定、參與決定研究設計、進行統計分析、詮釋研究結果、以及各章節撰稿等貢獻。
5. 請附兩份原稿（一份原稿和一份複印稿，但圖片應使用原圖），包括附表、附圖及照片。圖表應專業製作，一張紙僅一個附圖或附表，依引用順序以阿拉伯數字標出排列。附表須有標題及說明。照片須 5×7 吋光面黑白，背面以鉛筆編號，附圖須有簡單說明（Legend），並另頁撰寫。光學或電子顯微鏡照片，請註明擴大倍率或比例。

註：¹ 根據「生物醫學雜誌投稿之統一規定」第五版，刊載於 Annals of Internal Medicine 1997;126(1): 36-47.

肆、參考文獻

未經發表之論文或摘要不得列為參考文獻，但可於本文中說明並註明「未發表」（unpublished observations）。博碩士論文可引用。已被任何雜誌接受刊發但仍未發表之著作，請列出雜誌名稱及年份，並註明「in press」。

原著論文、病例分析研究、病例報告等論述及特別約稿之綜論（review article）按下列格式撰寫：

1. 雜誌名稱之簡稱須按照 Index Medicus 型式，作者人數小於 6 位時，詳列所有作者姓名，超過 6 位時，只須列出前 6 位，其它以「等」（et al）代替。

例：Bhasin S, Storer TW, Berman N, Callegari C, Clecenger B, Phillips J, et al. The effects of supraphysiologic doses of testosterone on muscle size and strength in normal men. N Engl J Med 1996; 335:1-7.

2. 本文內引用時，若兩名以下作者請列出姓氏。兩名以上則列出第一名之姓氏，其他以「等」

(et al) 代替，並以阿拉伯數字方括弧表示於引用之後。

例：One of the first well documented reports of ECH poisoning with fatality in young children was reported by Miller et al. in 1970^[2].

3. 參考範例

A. 期刊：[作者姓名：題目。雜誌簡稱 年代；卷數（期數）：起迄頁數]

- (1) 許吟姿、楊光道、張恆鴻：結締組織疾病併發間質性肺病變患者 99mTc-DTPA 肺廓清率之臨床研究。內科學誌 1992;3:79-83.
- (2) Yang KTA, Chen HD: A semi-automated method for edge detection in the evaluation of left ventricular function using ECG-gated single-photon emission tomography. Eur J Nucl Med 1994;21:1206-11.

B. 單行本：[作者姓名：書名，版數（卷數）。發行地；出版公司，年代：引用部份頁數]。

- (1) 楊志良：生物統計學新論，一版。台北；巨流圖書公司，1984：33-8.
- (2) Plum F, Posner JB: Diagnosis of Stupor and Coma. 3rd ed. Philadelphia: Davis, 1980:132-3.

C. 多重作者之單行本：[有關文章作者姓名：書名，版數（卷數）。發行地；出版公司，年代：引用部份頁數]。

- (1) 蔣欣欣：護理與健康，編輯：顧乃平：護理專業導論，一版。台北；匯華出版公司，1991：83-121。
- (2) Levinsky NG: Fluid and electrolytes. In: Thorn GW, Adams RD, Braunwald E, Isselbacher K, Petersdprf RG eds. Harrison's Principles of Internal Medicine, 8th ed. New York: Mcgraw-Hill, 1977:364-75.

伍、著作權

若著作人投稿於本刊經收錄後，同意授權本刊得再授權國家圖書館或其他資料庫業者，進行重製、透過網路提供服務、授權用戶下載、列印、瀏覽等行為。並得為符合各資料庫之需求，酌作格式之修改。若為摘譯、譯稿或改寫稿，需附原作者之正本同意書，並附原文影本一份；來稿如涉及版權，概由作者自負文責。

童 綜 合 醫 學 雜 誌

編著的話

- 49 專業間之全人醫療教學
遲景上

綜 論

- 54 蘋果多酚在發炎的潛在應用
李慧禎

原 著

- 59 住院榮民失智症、認知功能減退及憂鬱症之盛行率和危險因子調查研究
楊自強 鄭啓清 吳淑姿 林怡君 卓良珍
- 65 兩種不同衛教方案對居家主要照顧者執行導尿管照護成效之探討
饒芳枝 莊淑婷 邱政元 林麗英 鄭啓清 郭建宏

病例報告

- 74 腹腔鏡輸卵管全切除手術後自然發生同側輸卵管間質部異位妊娠：案例報告及文獻回顧
汪文生 魏添勇 高衡峰
- 79 外傷性髖關節前上方位脫臼合併神經血管損傷之病例報告
黃清順 徐少克 陳學明
- 84 保守治療成功治癒魚刺造成迴腸穿孔- 病例報告
黃茂裕 陳彥霖 蕭博仁 鄭幼文
- 90 女性自發性膀胱破裂- 病例報告
謝肇新 翁瑋駿 童敏哲
- 95 腎上腺庫欣症候群合併香草扁桃酸偏高- 病例報告及文獻回顧
陳滄淇 蔡政麟 張建榮 余積琨
- 100 以暫時性失語症為表現之隱球菌腦膜炎
蕭振倫 林信光

