
	<p>Contents lists available at www.innovativejournal.in</p> <p>INTERNATIONAL JOURNAL OF NURSING DIDACTICS</p> <p>Homepage: http://innovativejournal.in/index.php/ijnd</p>	 <p>ISSN: 2231-5454</p>
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Clinical Application of Ambulatory Ward Nursing for Patients Undergoing Glaucoma Filtration Surgery

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DOI: <https://doi.org/10.15520/ijnd.v8i12.2386>

Abstract: Aims and objectives: To evaluate the efficacy and safety of out-patient “day surgery” nursing mode for glaucoma filtration surgery.

Background: While out-patient “day surgery” is already the preferred practice in 99% of ophthalmic surgeries in USA, until quite recently, patients being hospitalized for several days was still the standard in most eye hospitals in China. Because of the overwhelming clinical responsibilities relative to quite limited medical resources, the Chinese government is undergoing a comprehensive medical reform attempting to reconcile this conflict. As to ophthalmology, transition to out-patient surgery at a tertiary eye hospital is proactively encouraged.

Design: Retrospective case study.

Methods: Clinical data of 134 patients received glaucoma filtration surgery in Zhongshan Ophthalmic Center between November 2014 and November 2015. All participants were followed up for 6 months to 1 year. Surgery success rate, efficiency and safety profile of nursing mode adjusted to this out-patient setting was retrospectively analyzed.

Results: Among 134 glaucoma patients, 131 cases (97.8%) were with a successful outcome using out-patient surgery setting and nursing mode. Among those 3 with complications, one was hospitalized due to intraoperative transient blurry vision and 2 other cases were shifted to hospitalization because of postoperative shallow anterior chamber and severe inflammatory response. Compared with conventional hospitalization, the waiting time for hospital bed was shortened from 5-6 days to 0.5-1 day, and the mean length of hospital stay was reduced from 4.5 days to 1 day. The average hospitalization expense of filtering surgery, including trabeculectomy and drainage device implantation, were decreased from 6295 to 5175 and 12658 to 10757 RMB Yuan respectively, when the numbers were compared with conventional hospitalization.

Conclusion: While improving the efficiency of glaucoma filtration surgery using out-patient setting and nursing mode, it is also successful and practical in term of surgery outcomes.

Relevance to clinical practice: High-efficiency out-patient surgery setting and nursing mode can be a preferred protocol of practice in China’s major eye hospitals.

Keywords: Glaucoma filtration surgery; Out-patient surgery; Nursing mode

What does this paper contribute to the wider global clinical community?

Conversion of traditional hospitalized practice to an efficient out-patient eye surgery setting and nursing mode is very urgently needed in developing countries, including China and many other countries, who has a large patients’ population and limited medical resources.

INTRODUCTION AND BACKGROUND

While outpatient surgery is already the preferred practice in 99% of ophthalmic surgeries in USA, until one to two years ago, hospitalized ophthalmic surgery for several days was still the standard practice in most eye hospitals in China. Because of the overwhelming clinical responsibilities in contrast to the limited medical resources, the Chinese government has to proactively encourage tertiary eye hospital to adapt to an out-patient day surgery mode. Day surgery refers to the practice of admitting to hospital on the day of surgery for eligible patients with anticipated indications for preoperative examination, assessment of

anesthesia, planned surgical procedure and hospital discharge within hours of the same day. The patients do not require an overnight hospital stay (Owens PL et al. 2014). Day surgery has a variety of advantages, such as high efficiency, convenient operation, short length of hospital stays, low expense and effectively distribution of limited medical resources to the maximal potential (Hollenbeck BK, 2015). The implementation of day surgery complies with the development orientation of contemporary hospital management (Hollenbeck BK, 2015). Most ophthalmic surgeries can be performed in a relatively short, repeated and reproducible pattern, which is specifically suitable for a day surgery settings (Yang C, 2014). At present, day surgery

has been adapted for cataract surgery, vitreoretinal surgery, various fundus laser therapies, pterygium, extraocular plastic surgery, and strabismus corrections in some eye centers in China (Yang C, 2014, Shaikh S, 2003). While some eye centers are converting ophthalmic surgeries to an out-patient day surgery setting, it has not been reported for glaucoma filtration surgery, which is commonly associated with more frequent peri-operative complications, including shallow anterior chamber, hyphemia and malignant glaucoma, etc (Valentine J, 2014). Consequently, the application of out-patient day surgery mode to glaucoma filtering surgery has not been reported. As a national leading glaucoma service in China, we have pioneered in converting glaucoma filtration surgery into an out-patient day surgery mode. To evaluate the efficiency and safety of this transition, we retrospectively review patient records, and preferentially analyze nursing related issues for patients receiving glaucoma filtration surgery. Hopefully, the experience and preferred pattern obtained from our pioneered practice can be of help to many other eye hospitals in China and other developing countries.

METHODS

Baseline characteristics:

A total of 134 patients undergoing glaucoma filtration surgery in Zhongshan Ophthalmic Center of Sun Yat-sen University between November 2014 and November 2015 were recruited into this study. There were 71 males and 63 females, aged 16 to 82 years, with a mean age at 54 ± 24.5 years. Among them, 115 cases underwent trabeculectomy, 7 receiving drainage device implantation and 12 undergoing Ahmed glaucoma valve implantation (Table 1). All patients received systemic physical examination and ophthalmic evaluation in the outpatient clinic. Thirty-eight cases reported a medical history of hypertension, which was well controlled by medication, while 25 cases were with a history of diabetes mellitus, which were successfully controlled by blood glucose-lowering agents prior to surgery date. No other severe systemic diseases were present in our patients population. Prior to surgery, all participants were administered with medication for controlling intraocular pressure and received antibiotics eye drops for over 2 days. Postoperative follow-up continued for 6 months to 1 year.

Table 1. Basic information

Index	Age (y)	Gender		Surgery				
		Male	Female	Trabeculectomy	Drainage device implantation	Ahmed glaucoma valve implantation		
Number	54 ± 24.5	71	63	115	7		12	

Nursing mode:

Ambulatory nursing team consisting of a team of doctors and nurses was established. Inclusion criteria for glaucoma filtration surgery were determined, the work flow and system were refined and the integrated management of physicians and nurses was implemented.

Pre-hospital nursing care:

Physicians and nurses were responsible for clinical evaluation, preoperative examination, health education and psychological nursing for each patient. The chief physician selected candidate patients who were suitable for a day-care nursing mode. In one-stop outpatient setting, preoperative routine examinations and related ocular tests were performed. Based upon the test outcomes, the doctors and nurses in the ward collectively delivered preoperative assessment, evaluated the risk of surgical contraindications, arranged the day of surgery, offered health education, preoperative guidance, psychological counseling and evaluation to mitigate psychological pressure.

In-hospital nursing care:

Preoperative care: After admission, systemic and psychological status of the patients was re-evaluated. Preoperative preparation including surgical cooperation and nursing information was performed. **Postoperative care:** Clinical treatment and postoperative health education were delivered strictly according to the physicians' prescription. The nursing staff informed the patients with precautions to be taken, potential discomfort and symptoms, safety instructions at home and the telephone number of the on duty medical staff to call in case of an emergency. After 2-4

hours' observation, the patients without untoward symptoms and signs were discharged, but must be accompanied by at least one family members. In the evening, nurses would give the patient and his/her family a telephone call for following up potential problems.

Nursing care after discharge:

At postoperative day one, postoperative patients returned to the ward for examination. The physicians and nursing staff should educate the patients and family members how to protect the operated eye, use of medication, physical condition observation, self-nursing knowledge and dietary precautions in daily life. If there were no complications, patients were discharged from hospital. A follow-up team consisting of 1 physician and 3 nurses was established and then resumed responsibility following up the patients. Follow-up was performed via We Chat online chatting tool and/or telephone call depending on the preference and availability from the patient. During subsequent follow-ups, the patients were evaluated for visual acuity, subjective symptoms, use of medications, psychological status, answering question and recovery guidance.

RESULTS

Surgery success rate:

A total of 131 patients undergoing out-patient day surgery were successful and were discharged after 2-4 hours' observation. No falling or bumping accidents were reported after hospital discharge. We have received telephone calls from six patients for medical issue consultations in the same evening of the surgery day. No serious postoperative

complications were reported. On postoperative day one, all patients return for follow-up exams strictly. The surgery success rate was 97.8% and no intraocular infection or other serious complications were encountered.

Failure cases:

There were three cases who experienced unexpected complications. One patient experienced transient blurry vision. Surgery was postponed and the patient was referred to traditional hospitalization. After oxygen inhalation and vasodilator therapy, the patient regained light perception 3 hours later. Surgery was performed successfully the next day. Another 2 patients experienced shallow anterior chamber on postoperative follow-up due to excessive filtration and relatively more obvious anterior chamber inflammation. The patients were hospitalized for a more aggressive medical treatment with compression bandage, oral steroid use, and mydriasis cycloplegic agents. One

patient recovered with normal anterior chamber depth on postoperative day 4 after treatment, while the other patient recovered well with anterior chamber reconstruction procedure.

Waiting time for surgery, length of hospital stays and overall expense:

Compared with conventional hospitalization, the waiting time for surgery averagely was shortened from 5-6 days to less than one day (Figure 1), while the mean length of hospital stay was reduced from 4.5 days in conventional surgery to within one day in an out-patient day surgery setting (Figure 2). The average hospitalization expense of trabeculectomy and drainage device implantation in out-patient day surgery respectively decreased from RMB 6295 to 5175 ($P<0.05$) and RMB 12658 to 10757 ($P<0.05$) Yuan per patient (Figure 3).

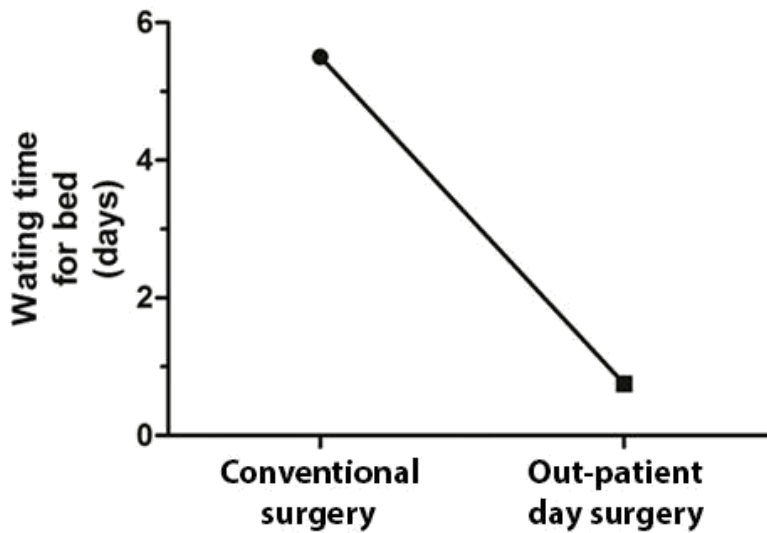


Figure 1. The average waiting time for surgery was shortened from 5-6 days in conventional surgery to less than one day in out-patient day surgery setting.

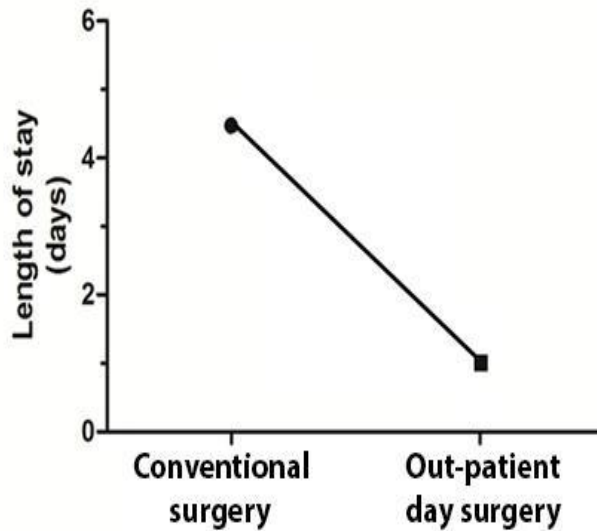


Figure 2. The mean length of hospital stays was reduced from 4.5 days in conventional surgery to within one day in out-patient day surgery setting.

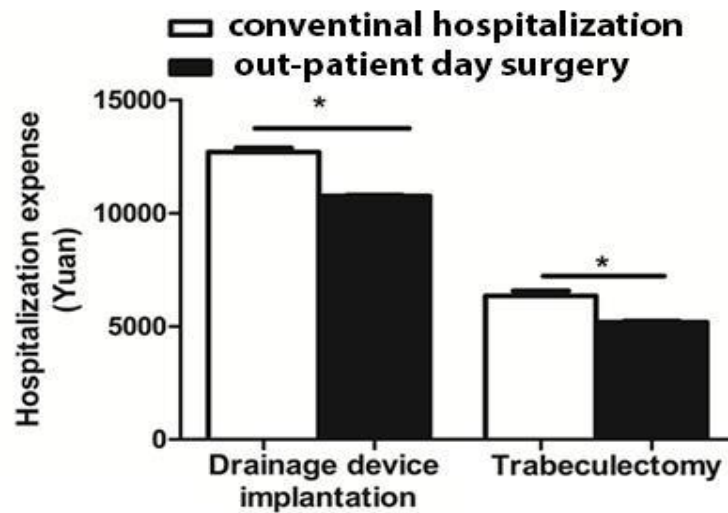


Figure 3. The average hospitalization expense of trabeculectomy and drainage device implantation in out-patient day surgery respectively decreased from RMB 6295 to 5175 ($P<0.05$) and RMB 12658 to 10757 ($P<0.05$) Yuan per patient.

DISCUSSION

The concept of day surgery was initially proposed and applied in the service of Pediatrics by the Britain physician Nicoll and then gradually grows in popularity worldwide (Young DG, 2006). Currently, the medical healthcare system in China is undergoing a radical reform towards the goal of offering convenient, high-efficient, high-quality medical cares with relatively limited overall resources available. Over the past decades, the quantity of both in-patient and out-patient in central public hospitals has been increasing dramatically. In ophthalmology, out-patient day surgery started in cataract service to shorten the waiting time. In June 2014, out-patient day surgery setting was established at our glaucoma service, working on patients to receive relatively simple surgical interventions, such as peripheral iridectomy, phacoemulsification and intraocular lens implantation, laser photocoagulation of ciliary body. The setting runs smoothly with quite positive feedback from surgery patients.

Glaucoma is the second leading cause of blindness around the world, while filtration surgery, especially trabeculectomy, is still the most commonly performed anti-glaucoma surgical procedure (Young DG, 2015). Nevertheless, filtration surgery is associated with complications including early filtration bleb leakage and shallow anterior chamber induced by excessive filtration. If left untreated, these postoperative complications may cause persistent shallow anterior chamber, malignant glaucoma, complicated cataract or rapidly-evolving primary cataract (Casini G, 2015). If complications are identified and managed a timely and appropriate manner, these conditions are usually transient, and do not affect a successful filtration surgery (Van Bergen T, 2015). Therefore, close postoperative follow-up plays a critical role in a successful glaucoma filtration surgery. Conventionally for precautions, patients are hospitalized for 5 to 7 day after glaucoma filtration surgery. As skills and experience of filtration surgery improves, we gradually see less and less

postoperative complications, and consequently, the average length of hospital stay reduces to around four and a half days at our glaucoma service. In the background of Chinese medical reform, we are considering whether we can transform conventional glaucoma filtration surgery into an out-patient day surgery mode. Apparently, the transition of nursing mode is very important to support this surgical mode transition.

Starting from November 2014, we started to test the feasibility of doing glaucoma filtration surgery at our out-patient day surgery setting. We do still have concerns on the surgical risks and complicated peri-operative managements. Consequently, we adjusted our nursing mode to fit in this transition. As we have known for a long time, glaucoma is a chronic ocular condition, of the psychosomatic disease category. A vast majority of glaucoma patients have type-A personality, characterized by being sensitive, proactive, anxious, or fear, stress, depression and other negative emotions (Bubella RM, 2014). To support the filtration surgery transition, an enhanced nursing mode needs to be established, focusing on the care of patients' psychological stress at an out-patients filtration surgery.

Many specific protocols are established in regard to patient's selection and management. Firstly, physicians and nurses are responsible for preoperative assessment and selection of appropriate patients' candidates. Patients who may require more complicated surgery or are expected to have serious postoperative complications, such as those patients with angle-closure glaucoma, microphthalmia or complicated anterior segment abnormalities are excluded from this out-patient day surgery study. Secondly, prior to administration, psychological assessment and necessary counseling are performed in each glaucoma patient. One case in our study experienced a transient blurry vision intraoperatively, quite likely result from transient optic nerve ischemia induced by excessive emotional stress, increased sympathetic nerve activity and retinal arteriolar spasm (Panarelli JF, 2016). Thirdly, it is imperative to emphasize on follow-up examinations on postoperative day one. Both physicians and nurses should attend in the exam

and get familiar with each patient's specific condition. If there are any abnormal findings, the team should work closely to make sure that conditions are treated immediately and appropriately. In this study, there are two patients with shallow anterior chamber identified on postoperative day one, due to excessive filtration and aggravated inflammation. The patients were immediately hospitalized. The condition was treated and relieved quickly. Fourthly, peri-operatively, the nurse should strive to establish a close and constructive communication with the patient and his/her family. The nursing staffs are those who directly educate patients and their families on how to identify abnormal signs after surgery, and all the information related to medications and precautions to be taken. Lastly, we have adopted the use of latest social media software, We Chat, the most popular online chatting app in Chinese speaking populations. Online telephone interview is also used during subsequent follow-ups and any questions raised by patients are answered immediately. The We Chat gives a mutual and real-time connection between nursing staffs and the patients. We found that its use is associated with an overall increased satisfaction rate by 5.1% while patients' compliance was improved.

Taken together, there are many important factors to be considered during this out-patient day surgery setting and accompanying nursing mode transition. Overall, this new mode is sufficient, safe and practical for potentially many other major glaucoma services.

CONCLUSIONS

Nursing is a critical component for successful glaucoma patient management. Under the background of Chinese medical reform promoting efficient use of limited medical resources, an out-patient day surgery mode with modified nursing mode is efficient, safe and practical for glaucoma filtration surgery. This transformed practice mode is associated with very good surgical success rate, shorter hospital stay, lower costs and better efficiency in using limited medical resources.

RELEVANCE TO CLINICAL PRACTICE

Currently China is undergoing a systemic medical reform to target its over-burden medical responsibilities in contrast to limited medical resources availability. This study retrospectively investigated the safety, efficiency and feasibility of using an out-patient day surgery setting and nursing mode in filtration glaucoma surgery. Results are positive, providing a promising example for other glaucoma services in China to adapt, which altogether will improve the efficiency of clinical practice in Chinese medical system. Many other developing countries may face similar condition of contradictions medical practice. Hopefully, our pioneer work and experience can help these countries improve their efficiency too and accomplish a smooth transition.

REFERENCES

- [1]. Owens PL, Barrett ML & Raetzman S (2014). Surgical site infections following ambulatory surgery procedures. *JAMA* **311**(7),709-716. URL: <https://www.ncbi.nlm.nih.gov/pubmed/24549551>.
- [2]. Hollenbeck BK, Dunn RL & Suskind AM (2015). Ambulatory Surgery Centers and Their Intended Effects on Outpatient Surgery. *Health Serv Res* **50**(5),1491-1507. URL: <https://www.ncbi.nlm.nih.gov/pubmed/25645136>.
- [3]. Yang C, Chen A & Wang Y (2014). Prevention and control of perioperative incision infection in patients undergoing day cataract surgery. *Eye Sci* **29**(3),182-5. URL: <https://www.ncbi.nlm.nih.gov/pubmed/2601977>.
- [4]. Shaikh S, Chung F & Imarengiaye C (2003). Pain, nausea, vomiting and ocular complications delay discharge following ambulatory microdiscectomy. *Can J Anaesth* **50**(5),514-8. URL: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Pain%2C+nausea%2C+vomiting+and+ocular+complications+delay+discharge+following+ambulatory+microdiscectomy>.
- [5]. Valentine J, Zurakowski D & Ayyala RS (2014). Comparison of acquisition costs of surgical supplies in different health care systems for cataract and glaucoma procedures. *J Glaucoma* **23**(6),355-359. URL: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Comparison+of+acquisition+costs+of+surgical+supplies+in+different+health+care+systems+for+cataract+and+glaucoma+procedures>.
- [6]. Young DG, Carachi R. James H Nicoll, MB, CM Glasg & FRFPS Glasg (2006). Legion of Honour France, father of day surgery. *Scott Med J* **51**(1),48-50. URL: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Legion+of+Honour+France%2C+father+of+day+surgery>.
- [7]. Kim M, Lee C, Payne R, et al. Angiogenesis in glaucoma filtration surgery and neovascular glaucoma: A review. *Surv Ophthalmol* 2015; **60**(6),524-535. URL: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4615284/>.
- [8]. Casini G, Loiudice P & Martinelli P (2015). Malignant glaucoma-like syndrome after EX-PRESS filtration surgery. *Eur J Ophthalmol* **25**(4), e42-5. URL: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Malignant%20glaucoma-like%20syndrome%20after%20EX-PRESS%20filtration%20surgery>.
- [9]. Van Bergen T, Vandewalle E, Moons L & Stalmans I (2015). Complementary effects of bevacizumab and MMC in the improvement of surgical outcome after glaucoma filtration surgery. *Acta Ophthalmol* **93**(7),667-678. URL: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Complementary+effects+of+bevacizumab+and+MMC+in+the+improvement+of+surgical+outcome+after+glaucoma+filtration+surgery>.
- [10]. Bubella RM, Bubella DM & Cillino S (2014). Type A behavior pattern: is it a risk factor for open-angle chronic glaucoma? *J Glaucoma* **23**(4),199-201. URL: <https://www.ncbi.nlm.nih.gov/pubmed/?term=Type+A+behavior+pattern%3A+is+it+a+risk+factor+for+open-angle+chronic+glaucoma%3F>.
- [11]. Panarelli JF, Nayak NV & Sidoti PA (2016). Postoperative management of trabeculectomy and glaucoma drainage implant surgery. *Curr Opin Ophthalmol* **27**(2),170-176. URL: <https://www.ncbi.nlm.nih.gov/pubmed/26720779>.