



Day surgery in strabismus operation under general anesthesia

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Background: The purpose of this study is to summarize the application of day surgery combined with fast track program in strabismus operation under general anesthesia.

Methods: The clinical data of 2,000 cases of strabismus patients who had underwent surgery in day surgery or traditional hospitalization in the duration from 2015 to 2016 was retrospectively analyzed. The safety and efficacy were assessed by comparing the average length of stay in hospitals, anesthesia recovery time, patient satisfaction and number of adverse events.

Results: Compared with the traditional group, the average length of stay in hospital and recovery time in day surgery group were significantly lower ($P < 0.001$) and the satisfaction of patient was improved ($P < 0.05$), which were statistically significant difference. Moreover, no adverse events occurred among these patients.

Conclusions: The application of day surgery in strabismus operation under general anesthesia is feasible, which can reduce the recovery time and shorten the hospital stay of patients safely and effectively, and their satisfaction was improved at the same time.

Keywords: Day surgery; general anesthesia; fast track surgery; nursing

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Introduction

Strabismus is a common eye disease with a prevalence of approximately 5% in a typically developing children (1-3) and 4% in an adult (4), with a rising trend year by year. With strabismus is realized by more and more people as a curable disease, the awareness of medical treatment is getting stronger as well. Subsequently, the amount of strabismus surgery in our hospital is increasing in recent years. The day surgery ward, which was first launched in our hospital in 2012, is a surgical treatment model that patients do not need hospitalization at night (5). Patients who met the indications were informed to complete the systemic and specialist examinations as well as the assessment of anesthesia before the hospital admission, and appointed the time of surgery. Each surgery was performed on the day of

hospitalization, and the patient was discharged after a short rest for recovery. Day surgery was first performed in the patients with cataracts or glaucoma, performing under local anesthesia in our hospital. However, due to the specificity of strabismus surgery, numerous patients could not tolerate the pain of muscle traction during surgery, while nausea, vomiting and other adverse reactions also had a great effect on the process of surgery. For the above reason, most patients with strabismus in our hospital were operated under general anesthesia, using the traditional hospitalization model. In order to shorten the hospitalization time and speed up the rehabilitation of patients, our hospital began to carry out the day surgery mode of strabismus surgery under general anesthetic combined with the concept of fast track surgery in 2016, and achieved remarkable results.

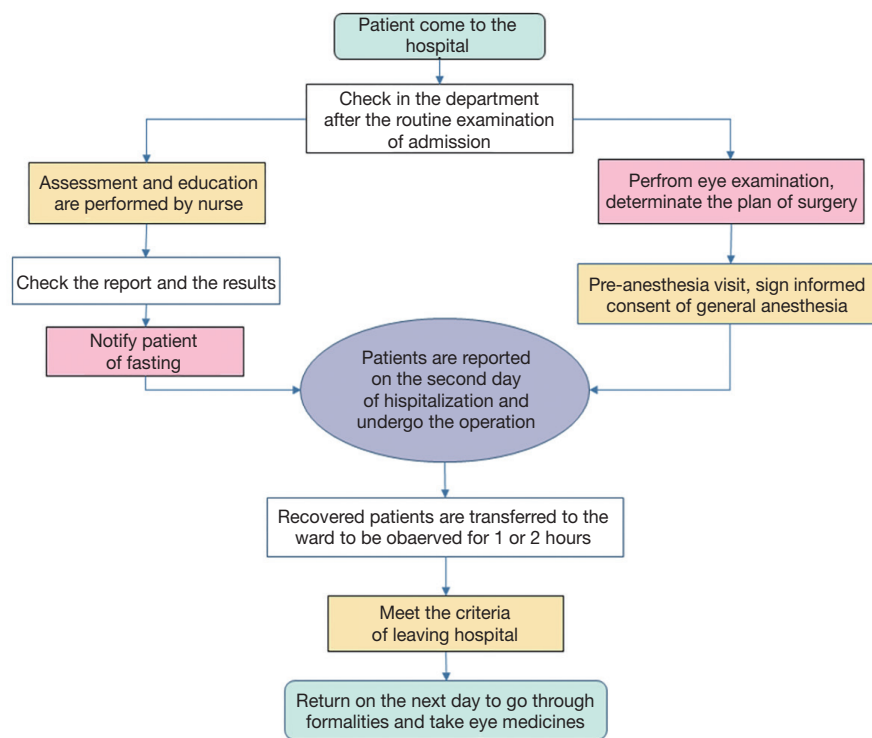


Figure 1 Day surgery mode.

Methods

A total of 2,000 patients with strabismus, who were admitted to our hospital and underwent surgery from January 1, 2015 to December 31, 2016, had been studied and divided into two groups, which are the traditional hospitalization group and the day surgery group. Patients aged from 3 to 80 years old with concomitant strabismus or non-concomitant strabismus in the first diagnose were included in this study, while those who abuse alcohol or other drugs, or have systemic disease such as hypertension and diabetes were excluded.

By reviewing and summarizing the average length of stay in hospitals, the recovery time and satisfaction of patients, a comparison was made between the day surgery group and the traditional group to evaluate the efficacy and safety of day surgery mode.

Traditional hospitalization mode

After admission, patients underwent routine examinations, including systemic and eye examinations, and received routine perioperative care.

Day surgery mode

Patients completed preoperative examination and anesthesia evaluation before admission, and surgery was performed on the day of hospitalization. Besides that, anesthesia and perioperative care were optimized in combination with the fast track program. Patients of the daytime mode in the hospital usually do not exceed 24 hours. Details of the process were shown in *Figure 1*.

The application of the fast track

The patient-centered is an important embodiment of the fast track concept, mainly achieved by anesthesia, minimally invasive surgery and perioperative care (6). The application of the fast track program of the day surgery mode performed in our hospital was mainly reflected in the anesthesia method and perioperative care.

Improving the anesthesia method

In order to ensure the safety of patients and shorten the recovery time, a safe airway approach, using the laryngeal

Table 1 Hospital stay, recovery time, patient satisfaction and adverse event in two groups

Characteristics	Traditional mode (n=1,000)	Day mode (n=1,000)	P
Gender (female, %)	51.7	53.2	0.50
Age (year)	14.38±8.56	16.38±12.08	0.34
Operation time (min)	33.56±13.02	34.88±11.91	0.60
Anesthesia time (min)	36.24±14.43	37.36±13.19	0.66
Hospital stay (days)	3.16±0.32	1.00±0.00	<0.001
Recovery time (min)	33.36±10.24	22.44±5.24	<0.001
Patient satisfaction (%)	95.32±1.36	97.28±1.15	<0.05
Adverse event	0	0	–

mask rather than the way of tracheal intubation, was established by the anesthesiology department of our hospital, which resulted in less damage to the patient. At the same time, more short-acting anesthetics (such as propofol) which could enable patients to wake up as soon as possible were applied to speed up postoperative recovery.

Perioperative nursing

Compared with traditional hospitalization mode, the hospitalization period of each patient was considerably shortened by adopting the day surgery mode. However, without the observation of a professional medical care team, patients might have unpredictable health problems that they do not know how to deal with after they were discharged from the hospital, as a consequence, they might have psychological problems such as anxiety and fear. Accordingly, in addition to the routine perioperative care for patients in the day surgery group, psychological care, assessment and mission before leaving hospital, and post-operative telephone follow-up are equally important.

Strengthen psychological care

Psychological care is an important part of fast track nursing especially before the surgery (7). By interviewing patients and their families, the major nursing problem was identified to associate with a lack of post-operative care knowledge. To solve this problem, the health education for patients and their families were strengthened by giving detailed explanation of the treatment methods for complications of various anesthesia and surgery by responsible nurses,

playing the video of nursing missions in the ward and posting relative posters in the corridor. In addition, patients' confidence could be enhanced by introducing successful cases of day surgery mode.

Strict criteria of departure from hospital

Before leaving hospital, the nurse will judge whether the patient meets the criteria by assessing the patient's diet, urination, eye dressings and risk of complications. For the patients who met the criteria, they will be offered a health education again before they leave, so as to consolidate knowledge of postoperative nursing for patients and their families.

Postoperative follow-up

For the patients in day surgery mode, in addition to a 1-week return visit, a postoperative call follow-up was also performed on the day of surgery, aiming to assess patient's physical and eye condition after returning home. Moreover, if any adverse event occurs, the return visit and follow-up would be capable to give an effort to identify the problem in time and offer some effective treatments that ensure patient safety while eliminating the patient anxiety.

Statistical analysis

The statistical analyses were conducted using SPSS 17.0 software, and continuous variables were analyzed by Student's t-test or the Mann-Whitney U test, obtaining the value of $P < 0.05$ that was considered as significant.

Results

Two thousand patients were enrolled in this study, and the data was expressed as mean \pm standard deviation (\pm SD). The detailed comparison of the data is shown in *Table 1*, expounding that the hospitalization and recovery time of the patients in the day surgery group were remarkably decreased, with a statistically significant difference. Meanwhile, patient satisfaction was also improved conspicuously. No adverse event was observed in both groups.

Discussion

In recent years, with the improvement of people's living standards, people's demand for medical services shows a trend of high-quality medical service (8). At present, fast track surgery is a widely used and matured in domestic and

international medical models. It refers to the application of a series of effective methods in the perioperative period to reduce the incidence of surgical stress and complications, and accelerate the postoperative rehabilitation of patients (9). The day surgery mode supposed in the present study is successfully carried out in strabismus operation, which is combined with the concept of fast track surgery. Through the comparison between two groups, the improvement of anesthesia and the targeted care in perioperative period for the patient of, day surgery mode is confirmed to not only shorten the time of the patient's hospitalization and recovery time of anesthesia, but also ensure the patient's safety and effective recovery, and make the patient more satisfied at the same time within the whole treatment process.

Improvement of anesthesia is a precondition for changing the day surgery mode, which can be achieved through the laryngeal mask, an artificial respiratory tract developed by a British anesthesiologist based on the anatomy of the human throat (10). It is a new type of respiratory ventilation device between the mask and the tracheal intubation (11,12) that enables the patient to perform spontaneous breathing or positive pressure ventilation by using a laryngeal mask during anesthesia. As revealed by relative studies (13), compared with tracheal intubation anesthesia, children with laryngeal mask ventilation have stable vital signs, no aspiration, agitation, and airway obstruction occur during surgery, and the recovery time is manifestly shorter than that in the tracheal intubation group. Therefore, the clinical efficacy of the laryngeal mask in pediatric anesthesia is superior to the tracheal intubation method, and provides a higher safety. Anesthesia method is transformed from tracheal intubation to laryngeal mask for general anesthesia. This kind of anesthesia can reduce discomfort in the patient's throat, allowing the patient to eat faster after recovery and get discharged as soon as possible.

Strict assessment before leaving hospital is a guarantee of postoperative patient's safety. After discussion with anesthesiologists, the criteria of leaving hospital after surgery was established and enforced rigorously. As a result, the implementation of this assessment ensures the safety of the patient and reduces the risk of adverse events after leaving hospital.

Any form of day surgery center requires postoperative rehabilitation and continuous care. Continuous care provided for the patients, who undergo the day surgery and are discharged from the hospital, is an important measure to ensure their postoperative safety. Besides, postoperative visit is a decisive continuation of postoperative care (14).

According to a previous study, 87.2% of day surgery patients would like to receive continuous care from the hospital through the phone call, followed by the return visit and internet (15). In order to guarantee the safety of each patient, the responsible nurse will conduct a call-back to the patient who left from the hospital on the same day, and take the initiative to learn about the general condition of the patient, especially the operated eye, then give corresponding guidance measures. Moreover, this kind of continuous care service allows patients to receive care from the hospital even leave out the hospital, which can help improve the satisfaction of patient.

Although the authors have conducted a retrospective review with a great amount of patients, there are still certain deficiencies in this study. Firstly, in the view of the fact that it is a retrospective study, the level of evidence is low and probably accompanied with bias, while the conclusion is limited. Secondly, the type of surgery has a striking effect on the time of anesthesia and recovery time. Finally, baseline characteristics of the patients are not evaluated in the present study, which may be a potential element for the result.

Conclusions

Combined with the concept of fast track, the day surgery of strabismus operation under general anesthesia, which can safely reduce the hospitalization time and recovery time of patients, was successfully carried out in this research, followed by the achievement of the effect of fast track, hence improving patients' satisfaction. What is more, the application of day surgery mode could accelerate the turnover of hospital beds, make more effective use of medical resources, and provide treatment services for more patients. However, more well-designed prospective randomized controlled trials will be needed to further assess the conclusions of this study.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/aes.2018.11.04>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This study was approved by The Medical Committee of Zhongshan Ophthalmic Center, Sun Yat-sen University (approval number 2018KYPJ127) and written informed consent was obtained from all patients.

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