Original Article

Application of a Quality Control Circle to Reduce the Wait Times between Continuous Surgeries

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Abstract

Purpose: To investigate how to shorten patient wait times between continuous ocular operations and to evaluate the influence of a quality control circle (QCC) on operating room management.

Methods: QCC management was established to conduct activities. Clinical data were collected to analyze the causes of long wait times between continuous surgeries. Effective measures were undertaken correspondingly.

Results: The staff from QCC actively undertook measures that would significantly shorten patient wait times between continuous ocular surgeries ($P<0.05$).

Conclusion: Multiple measures, such as setting up a QCC, enhancing the arrangement of surgical procedures, establishing effective communication channels, optimizing human resources, and integrating the use of instruments, can effectively shorten patient wait times between continuous vitreous or retinal surgeries. (***Eye Science 2015; 30:60-62***)

Keywords: quality control circle; vitrectomy; wait time

Introduction

Since its emergence in Japan in the 1960s, the quality control circle (QCC) has been widely applied in all walks of life, and especially in quality control of nursing care[1-3], safety management of nursing services[4], education of nursing staff, and instrument maintenance and management. The QCC is now utilized as a conventional measure for improving the quality of nursing care.

Ocular surgery is characterized by its large quantity and rapid turnover. However, wait times between two consecutive operations greatly vary, so effective measures for managing wait times are needed. The causes of long wait times between continuous surgeries were explored in our hospital, and QCC management was established. This study evaluated the effect of the QCC on the length of patient wait times.

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Materials and methods

Subjects and methods

Clinical data of 100 complicated vitreous and retinal surgeries were collected and statistically analyzed. The data consisted of the consistency between the time of the first surgery written on the notice and the starting time of surgery, the consistency between the wait times written on the notice and the starting time of operation, the time taken for complicated vitreoretinal surgeries, the patient wait times, and the causes of long wait times. Inclusion criteria were patients who were undergoing complex vitreoretinal operations, who had no history of hypertension or diabetes, who were undergoing surgery under local anesthesia, and who had signed the informed consents for enrollment in this study. Exclusion criteria were patients who were undergoing retinal reattachment surgery via an external approach, who had a history of hypertension and diabetes, or who were undergoing operations under general anesthesia.

Current situation

Among 100 cases, 52 patients waited for < 30 min for continuous surgery, 10 waited for 0.5–1 h and 38 waited >1 h. The 38 who had to wait for > 1 h had their surgeries delayed for many reasons, such as two simultaneous surgeries scheduled for the same surgeon, a first surgery running overtime by 15 min, another patient being sent to the operating room 15 min earlier, or delay in the start of surgery due to special circumstances, such as a shortage of operat-

ing tables and instruments, etc.

Analysis of potential causes

First, the chief surgeon was responsible for multiple simultaneous surgeries and the transfer of nurses to all patients in the operating room at the same time. Second, the first surgery was delayed and the patients had to wait longer due to poor communication between the nurses in the operating room and the hospital ward. Third, the nurses transferred the patients to the operating room too early. Fourth, accidental events, such as the occurrence of intraoperative complications, instrument dysfunction, and other events, prolonged the operation time and delayed the next surgery. Fifth, surgical instruments and devices needed sterilization after the previous operation so the next patients had to wait to undergo surgery.

Measures and solutions

Optimizing surgical procedures

Each surgeon should perform surgery in a fixed unit. The electronic system for surgery arrangement should be updated. The faculty leader should be responsible for arranging the operating room, discussing with the chief surgeon about the order of multiple surgeries at the same time, understanding each patient's severity of disease, and estimating the operation time, thereby shortening patient wait times. The faculty leader should be familiar with the number and arrangement of surgeries and effectively communicate with the physicians and nurses in the hospital ward.

Enhancing the accuracy of operation times

Relevant systems should be established and fully implemented to ensure the accuracy of operation times by coordinating with the Department of Medical Affairs. The nurses should know the number of surgeries, the chief surgeon, operation times, and start times of surgeries, *etc.* They should immediately remind the chief surgeon within 15 min before the surgery starts. If the chief surgeon is absent for over 30 min, the nurses should report to the faculty leader. Meanwhile, they should fully utilize surgical resources to postpone the surgery until the surgeon arrives.

Establishing reasonable communication channels

The nurses in the professional discipline should receive training programs to enhance their work enthusiasm and responsiveness. A platform should be set up for effective communication between the operating room and hospital ward by telephone, mobile phones, electronic information systems, *etc.* The faculty leader and nurses from the hospital ward should communicate in a timely and effective fashion regarding surgical progress, preparation for next surgery, re-arranging the times of surgeries, and handling accidental events.

Optimizing human resources and instruments

The physicians from different disciplines should discuss the timing and number of surgeries, and the arrangement of operating rooms to maximize the surgical resources. The nurses on duty should report any irregularities, such as shortage of surgical instruments, to the chief nurse and surgeon, and re-arrange the time of surgery. Surgeons should place high priority on complicated and challenging operations. Experienced surgeons and nurses should be appointed to guarantee the best efficiency of the operating room.

Statistical analysis

The patient wait times before and after the intervention were statistically analyzed with the *chi*-square test. $P<0.05$ was considered statistically significant. SPSS 17.0 statistical software was utilized for data analysis (SPSS, Chicago, IL, USA).

Results

Prior to the intervention, 38 of 100 cases (38%) had to wait for over 1 h for their surgeries. After the intervention, only 5 patients (5%) waited for > 1 h

Table 1 Causes of long wait times before and after the intervention

	Simultaneous surgeries for one surgeon	> 15 min after the starting of the first surgery	Transferring patients to the operating room 15 min earlier	Delay of starting time of surgery due to intraoperative events	Waiting for surgical table and instruments	Total (*n*=)
Before intervention	18	8	7	4	3	38
After intervention	0	2	0	1	2	5

for their surgeries.

Table 2 Comparison of wait times before and after the intervention

Time (h)	Wait times < 1 h	Wait times > 1 h
Control group	62(62%)	38(38%)
Observation group	95(95%)	5(5%)
$\chi^2 = 30.336; P < 0.05$		

Discussion

Surgery is likely to cause patients to experience psychological stress and negative feelings, such as anxiety, fear, and tension. In addition, the high-intensity working environment in the operating room adds to the patients' feelings of loneliness, nervousness, and isolation[6]. Psychological fluctuations may affect the stability of blood pressure and heart rate. Psychological stress could also disrupt the normal functioning of the neuroendocrine and circulation systems, thereby affecting anesthesia and surgery, postoperative recovery, and the subjective evaluations of the patients. Moreover, the risk of accidental events is significantly elevated during long wait times, especially in elderly patients with complications such as hypertension, diabetes, and cardiac diseases. Hence, shortening patient wait times between continuous surgeries is of clinical significance.

This study collected the clinical data on the time intervals between 100 complex vitreoretinal surgeries and then analyzed the causes of long wait times between continuous surgeries to identify appropriate solutions. The QCC management was adopted to shorten the wait times, and the number of patients who waited for > 1 h was significantly reduced from 38 to 5 after this management. These outcomes indicate that QCC can effectively shorten wait times between continuous vitreoretinal surgeries, thereby enhancing surgical safety and efficacy and elevating each patient's degree of satisfaction.

The application of the QCC also significantly activates the wisdom, passion, and enthusiasm of the nurses, which in turn elevates the efficiency and quality of nursing care. The QCC enables the nurses to put theoretical knowledge into practice and utilize scientific management to resolve practical problems. The QCC also strengthens the communication among different departments, increases work efficiency, and enhances the patient's degree of satisfaction.

However, unexpected interfering events occurred during QCC management, including complex surgical procedures required during vitreoretinal surgery, intraoperative complications, and shortages of surgical instruments and devices. Based on the PDCA procedures, we undertook measures to standardize and institutionalize the procedures and connect the operating room to the clinical department using an information system. Thus, physicians and nurses in the clinical department can directly inquire about the number, surgical progress, and starting time of the next surgery, *etc*. More work should be conducted to enhance the efficiency of the QCC in nursing service.

References

1 Zhou LM, Xu JP. The application of quality control circle in the front control quality management of specimen in clinical laboratory. Chinese Nursing Management, 2013,13(4):73-76.

2 Chen XM, Peng L. Effect of Quality Control Circle program on nursing quality of observation nursing unit. Shanghai Nursing Journal, 2013.13(3):72-74.

3 Zhang FX, Yu YY, Xu ZL, et al. Effect of quality control circle program in the quality management of basic nursing in psychiatric wards for the elderly. Chinese Journal of Nursing,2013,48(2):127-130

4 Li H, Yu CH, Wu HM. Application of quality control circle in bedsore of patients with advanced tumors. Chinese Journal of Nursing,2013,19(10):1201-1203.

5 Hong HL, Wang W. The status and countermeasures of on-site training of junior nurses. China Higher Medical Education,2011,12:61-62.

6 Ge GF, Tong WY. Management of continuous operation patients in waiting room. Chinese Journal of Nosocomiology,2012,22(21):4896.