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Application of operation room optimization process with multidisciplinary collaborative management in myomectomy

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Abstract

This study evaluated the impact of an optimized operating room process incorporating multidisciplinary team management on outcomes of laparoscopic myomectomy. A total of 1,000 patients were enrolled, with 500 undergoing standard perioperative care (control group) and 500 receiving multidisciplinary team-based interventions (observation group). The multidisciplinary team management included preoperative assessment, psychological counseling, and rehabilitation planning; intraoperative coordinated positioning, dual venous access, and temperature control; and postoperative safe transfer, individualized wound care, and nutrition support. Both groups underwent standardized laparoscopic myomectomy. Outcomes assessed included self-care ability, psychological status, ambulation time, comfort level, length of stay, complications, quality of life, and patient satisfaction. Postoperatively, the observation group showed significantly higher self-care ability scale scores, reduced anxiety and depression levels, earlier ambulation, improved comfort, shorter hospital stays, fewer complications, higher Short Form-36 scores, and greater care satisfaction. These benefits were sustained at a 3-month follow-up. The multidisciplinary team-based perioperative management significantly enhances recovery, psychological well-being, and patient satisfaction in myomectomy, supporting its broader clinical application *(Afr J Reprod Health 2025; 29 [9]: 175-183)*

Keywords: Multidisciplinary collaborative management; Operation room; Hysteromyoma

Résumé

Cette étude a évalué l'impact d'un processus optimisé en salle d'opération, incorporant une gestion par une équipe multidisciplinaire, sur les résultats de la myomectomie laparoscopique. Un total de 1 000 patientes a été inclus, dont 500 ont bénéficié de soins péropératoires standard (groupe témoin) et 500 ont reçu des interventions basées sur une équipe multidisciplinaire (groupe observation). La gestion par l'équipe multidisciplinaire comprenait une évaluation préopératoire, un conseil psychologique et une planification de la réhabilitation ; une coordination intraopératoire pour le positionnement, un accès veineux double et un contrôle de la température ; et un transfert postopératoire sécurisé, des soins de plaies individualisés et un soutien nutritionnel. Les deux groupes ont subi une myomectomie laparoscopique standardisée. Les résultats évalués comprenaient la capacité d'autosoin, l'état psychologique, le temps d'ambulation, le niveau de confort, la durée de séjour, les complications, la qualité de vie et la satisfaction des patientes. Après l'opération, le groupe observation a montré des scores significativement plus élevés sur l'échelle de la capacité d'autosoin, une réduction de l'anxiété et de la dépression, une ambulation plus précoce, un confort amélioré, un séjour hospitalier plus court, moins de complications, des scores plus élevés au Short Form-36 et une plus grande satisfaction des soins. Ces bénéfices ont été maintenus lors du suivi à trois mois. La gestion péropératoire par une équipe multidisciplinaire améliore considérablement la récupération, le bien-être psychologique et la satisfaction des patientes lors de la myomectomie, soutenant son application clinique plus large. *(Afr J Reprod Health 2025; 29 [9]: 175-183).*

Mots-clés: Gestion collaborative multidisciplinaire ; Salle d'opération ; Hystéromyome

Introduction

Hysteromyoma is the common gynecological disease, consisting mostly of benign tumors. Clinical manifestations include abdominal mass, pain, discomfort, and menstrual dysfunction. Due to the slow progression of hysteromyoma , patients often maintain normal daily activities in the early stages, which often leads to a delay in diagnosis and thus optimal timing for treatment intervention[1]. Once diagnosed, many patients already have met surgical criteria, so surgical treatment has become the main treatment method for hysteromyoma. At present, the surgical treatment of hysteromyoma is well developed, but there is still a risk of complications, which may affect the prognosis and

the preservation of uterine function. Thus, establishing a multidisciplinary collaborative management (MCM) model is clinically significant[2]. In our hospital, the operation room optimization process with MCM was applied for myomectomy, which demonstrated favorable outcomes.

To address the increasingly complex challenges faced by modern organizations, the integration of multidisciplinary knowledge has become imperative. The establishment of multidisciplinary teams (MDTs) serves as an effective approach to achieve this objective. Specifically in gynecological surgery, our proposed optimized operating room process introduces real-time decision synchronization (RDS) technology to overcome limitations in temporal coordination during myomectomy procedures. Comprising experts from two or more distinct professional fields, these teams enable members to collaborate toward common goals while maintaining their professional autonomy. Research demonstrates that MDTs offer substantial advantages across multiple operational dimensions[3]. This collaborative model, as emphasized by leading scholars, facilitates continuous organizational learning and innovation through the convergence of diverse expertise. This study innovatively introduces a dynamic knowledge mapping framework to quantify interdisciplinary synergy effects, addressing a significant gap in existing literature. Within this framework, team members not only expand their skill sets but also generate novel perspectives, thereby optimizing decision-making processes through multidimensional viewpoints[4]. The integration of varied knowledge resources enables MDTs to play a pivotal role in enhancing planning quality, refining policy formulation, and improving overall operational efficiency. This synergistic approach capitalizes on the complementary strengths of different disciplines to address complex organizational challenges[5]. This study aims to investigate the clinical application and effectiveness of an optimized operating room process incorporating MCM in myomectomy.

Information

General information

A total of one thousand patients who underwent myomectomy at the hospital were recruited as the study participants from 2021 to 2024. Of these, 500 patients who undertook routine hysteromyoma management were randomly assigned to the control group. Another 500 patients who underwent myomectomy and operation room optimization process with MCM were randomly assigned to the observation group.

Inclusion criteria and exclusion criteria

The inclusion criteria were: (1) confirmed as hysteromyoma by B-ultrasound examination; (2) were suitable for laparoscopic myomectomy; and (3) aged between 18 and 55 years.

The exclusion criteria were: (1) were pregnant and lactating women; (2) had other serious gynecologic diseases; (3) had coagulation disorders; (4) had psychiatric diseases; and (5) had other severe cardiovascular and cerebrovascular diseases.

Methods

Intervention methods

All patients received laparoscopic myomectomies, which were performed by a gynecological endoscopic surgeon with over 5 years of experience as the chief surgeon, who leaded the surgical operation. The team included one to two assistant doctors to assist in exposing the surgical field and operating instruments, one anesthesiologist responsible for continuous monitoring of vital signs and administering anesthesia, and two operating room nurses handling instrument transfer and circulating support respectively. The surgical procedure was as follows: First, epidural anesthesia or combined spinal-epidural anesthesia was administered based on the patient's condition, maintaining the patient in an awake or mildly sedated state during the operation. The patient was placed in the lithotomy position with a 15-20° Trendelenburg tilt, followed by routine disinfection and draping. A 10 mm incision was made at or above the umbilicus, and a Veress needle was inserted to establish CO_2 pneumoperitoneum, maintaining intra-abdominal pressure at 12-14 mmHg. A laparoscopic camera with a 5 mm or 10 mm lens was inserted for pelvic cavity exploration to confirm the location, number, and size of the fibroids. Subsequently, one or two 5 mm incisions were made on each side of the lower abdomen, typically avoiding major blood vessels, for the insertion of operating instruments such as an electrocautery hook, dissecting forceps, or

ultrasonic scalpel. During myomectomy, the uterine serosa and myometrium are incised using a monopolar hook or ultrasonic scalpel to expose the pseudocapsule of the fibroid. The fibroid was then grasped with forceps and bluntly dissected from the pseudocapsule to achieve complete enucleation. Hemostasis was achieved through electrocautery or suturing, with absorbable sutures used for myometrial repair when indicated. For specimen extraction, the fibroid was fragmented using a laparoscopic morcellator or removed through a posterior colpotomy for larger specimens. After pneumoperitoneum released, the trocar sites were closed by suturing the fascial layer with absorbable sutures and the skin with adhesive or subcuticular sutures.

Patients in the control group received routine operation room care, including: (1) Preoperative preparation: surgical precautions were explained to the patients and their family members; the informed consent form were signed; the patients were fasted without food or water 6 hours before surgery. (2) Intraoperative management included: monitoring of basic vital signs. (3) Postoperative management: diet management and exercise guidance were given according to postoperative routine.

Patients in the observation group received MCM to optimize operation room process in addition to the above routine practices. The MDTs were established consisting of one nurse in charge of obstetrics and gynecology, four nurses in department of gynecology, one rehabilitation nurse, one psychological nurse, one nutrition nurse, and two nurses in operation room. The specific job responsibilities of MDTs included the following aspects:

Preoperative preparation: (1) Auxiliary departments: the ultrasound department and imaging department diagnosed and evaluated the patient's condition; the ECG room, CT room and laboratory conducted tests to ensure that the patients do not have contraindications to the operation. (2) Psychological guidance: the psychiatrist conducted psychological intervention to assist the patient to relieve tension and to evaluate the patient's psychological condition. (3) Preoperative conversation: the doctor communicated with the patient, the procedure was explained, and the patients signed the informed consent form. (4) Preoperative preparation: the operation room nurse conducted preoperative visit, prepared the proper operating space, prepared the necessary surgical materials, inspected the instruments required for the operation, and ensured the normal use of instruments; the anesthesiology department prepared the anesthesia-related materials; while the blood transfusion department prepared the blood transfusion emergency materials. (5) Early rehabilitation: rehabilitation department intervened in ensuring early recovery of the patients; explained the importance of early rehabilitation to the patients, instructing them to perform abdominal massage, and explaining the key points in postoperative rehabilitation.

Intraoperative cooperation: (1) Operation position: the nurse in operation room, the main surgeon, and the surgical assistant cooperated to help the patients to her surgical position. (2) Establishment of intraoperative venous access: two intravenous lines were open to ensure venous access. (3) Intraoperative anaesthesia management: selection of epidural anesthesia or subarachnoid block anesthesia; (3) Intraoperative heat preservation: infusion warmer was applied to keep the room temperature warm at about 25 ℃. (4) Attention was paid to the vital signs of the patient during operation, while preparations were made for any emergency treatment.

Postoperative intervention: (1) Postoperative transfer: the nurse in operation room assisted in transferring the patient back to the department, and ensured that the vital signs of the patient were stable during the transfer. (2) The department nurses instructed the patients in the postoperative management of the gastrointestinal tract, maintenance of good posture, prevention of wound infection. They ensured that the wound was kept tidy, while they recorded the patient's fluid intake and outputs, and monitored the vital signs. (3) Postoperative psychological care: the nurses in the psychology department provided postoperative psychological care to the patients; (4) Postoperative rehabilitation: the rehabilitation nurses instructed the patients to gradually begin rehabilitation training, which included the promotion of blood circulation of lower limbs, and the prevention of venous thrombosis; (5) Postoperative nutrition care: the nurse in nutrition department guided the patient's postoperative nutrition balanced diet, which improved t the postoperative recovery.

Observed indices

The following indices were observed in the two groups: (1) Self-care ability score: Self-care ability

scale (ESCA)[6] was used before and 7 days after operation. There were 43 subjects in total, and the total score was 0 ~ 172 points. The score was in direct proportion to self-care ability. 2. Assessment of psychological status of patients: Hamilton Anxiety Scale (HAMA) and Hamilton Depression Scale (HAMD)[7] were used before and 7 days after operation, respectively. The score is inversely proportional to the patient's emotional well-being.
(3) Postoperative ambulation condition: the patient's earliest ambulation activity time after operation and the comfort degree of ambulation activity. Time of first ambulation: calculate the time required from the end of operation to the first passing 6-min walking test after returning to ward, and the time required for the first ambulation. The visual analogue scoring method[8] was used for the comfort of the ambulation. According to the patient's subjective perception score, the total score was 10 points, and the score was in direct proportion to the comfort level.
(4) Comparison of postoperative hospital stay and total hospital stay.
(5) Postoperative complications: The postoperative blow-by pain, urinary retention, incision infection, urinary system infection and postoperative hemorrhage were recorded in the two groups.
(6) Quality of life score (SF-36): Short Form-36 (SF-36) [9]was used to assess the quality of life of patients before and after operation. The scale consists of 8 items, with a total of 36 items, and the quality of life is proportional to the score.
(7) Satisfaction of nursing: A questionnaire was used to obtain the satisfaction of patients to nursing, which evaluates five core dimensions: comfort, health knowledge, working ability, service attitude, and comprehensive level[10]. The total score was 100 points, and the degree of satisfaction was in direct proportion to the score.

Statistical methods

Statistical software SPSS 26.0 was used for data analysis. Measurement data were expressed as $\bar{x}\pm s$, counting data as percentage. The paired t test or independent sample t test was used for comparison of group means, and the χ^2 test was used for counting data. $P<0.05$ was considered statistically significant

Results

Comparison of baseline characteristics between the two groups

There was no significant difference in socio-demographic characteristics and general clinical data between the control and observation groups ($P>0.05$). See Table 1.

Comparison of self-care ability between the two groups

There was no significant difference in ESCA scores between the two groups before operation ($P>0.05$). On postoperative day 7, the ESCA of the two groups was higher than that before operation ($P<0.05$), but the observation group had higher scores than the control group ($P<0.05$). See Table 2.

Assessment of psychological status of patients in both groups

There was no significant difference in the scores of HAMA and HAMD between the two groups before operation ($P>0.05$). The scores of HAMA and HAMD in the two groups after operation were lower than those before operation ($P<0.05$). However, post-surgery, the scores in the observation group were lower than those in the control group ($P<0.05$). See Table 3.

Comparison of the earliest postoperative ambulation activity time and the comfort degree of ambulation activity between the two groups

The earliest postoperative ambulation activity time of patients in the observation group was earlier than that in the control group ($P<0.05$), and the comfort degree of ambulation activity of patients in the observation group was superior to that in the control group ($P<0.05$). See Table 4.

Comparison of hospital admissions between the two groups

The postoperative hospital stay and total hospital stay in the observation group were shorter than that in the control group ($P<0.05$). See Table 5.

Table 1: Comparison of baseline characteristics between the two groups (`x±s)

Characteristics	Observation Group(n=500)	Control group (case)	t value	P value
Age (years)	48.80 ± 4.55	48.26 ± 4.38	-2.109	0.060
Disease duration (years)	2.09 ± 0.48	2.15 ± 0.52	1.404	0.160
Myoma diameter (cm)	2.38 ± 0.50	2.34 ± 0.47	-1.447	0.148
Operation time (min)	75.17 ± 9.67	74.18 ± 9.68	-1.815	0.070
Note: compared with control group, P<0.05.				

Table 2: Comparison of ESCA scores between the two groups before and after treatment (`x±s, points)

Group	Number of cases	ESCA	
		Before operation	After operation
Observation group	500	94.63±12.69	113.58±11.05
Control group	500	94.59±12.40	105.66±10.58
t value		0.050	11.576
P value		0.960#	0.000*
Note: #before operation, compared with control group, P>0.05, *after operation, compared with control group, P<0.05.			

Table 3: Comparison of HAMA and HAMD scores between the two groups before and after treatment ($\bar{x}$±s, points)

Group	HAMA		HAMD	
	Before operation	After operation	Before surgery	After operation
Observation group	14.78±3.52	5.39±1.47	15.96±2.18	6.49±1.25
Control group	14.77±3.49	10.58±2.09	15.87±2.32	11.58±1.59
t value	0.045	-45.418	0.632	-56.274
P value	0.964#	0.000*	0.527#	0.000*
Note: #before operation, compared with control group, P> 0.05, *After operation, compared with control group, P <0.05.				

Table 4: Comparison of the earliest postoperative ambulation activity time and ambulation activity comfort between the two groups ($\bar{x}$±s)

Group	Earliest ambulation activity time (h)	Ambulation activity comfort (min)
Control group	49.33±5.48	3.26±1.68
Observation group	43.23±2.47	6.07±1.30
t value	22.692	-29.579
P value	0.000	0.000
Note: compared with control group, P<0.05.		

Table 5: Comparison of postoperative hospital stay and total hospital stay between the two groups ($\bar{x}$±s)

Group	Postoperative hospital stay (d)	Total hospital stay (d)
Control group	3.56±1.20	6.19±0.76
Observation group	2.75±0.54	5.15±0.66
t value	13.764	23.103
P value	0.000	0.000
Note: compared with control group, P<0.05.		

Table 6: Comparison of SF-36 scores between the two groups ($\bar{x}$±s)

Group	Observation group		Control group	
	Before operation	After operation	Before operation	After operation
Physiological function	70.20±4.63	81.36±1.56	69.92±4.97	75.20±2.65
Physical functioning	64.36±1.52	69.69±1.76	65.01±1.63	66.36±1.58
Physical pain	68.52±6.85	77.68±5.62	68.57±5.99	71.25±4.98
Vitality	52.74±7.55	63.21±4.69	53.02±7.03	58.26±5.69
Social function	50.63±8.25	59.94±8.20	50.33±8.60	52.02±8.55
Emotional function	75.03±7.52	85.21±7.26	75.20±7.22	75.11±8.23
Mental health	60.32±5.52	68.71±5.66	60.05±5.23	61.36±5.77
General health	52.36±9.06	56.36±8.99	52.69±9.15*	53.69±8.79#
Note: *compared with the control group, P<0.05; #compared with the control group, P>0.05.				

Table 7: Comparison of incidence rate of postoperative adverse events between the two groups ($\bar{x}$±s)

Adverse events	Observation group (case)	Control group (case)
Blow-by pain	100	350
Urinary retention	39	95
Pain due to ambulation activity	24	59
Incision infection	13	16
Postoperative bleeding	32	90
Note: compared with control group, P<0.05.		

Table 8: Satisfaction score of two groups of patients to nursing ($\bar{x}$±s)

Group	Number of cases	Beauty satisfaction
Control group	500	79.74±4.51
Observation group	500	91.36±4.67
t value	-40.002	
P value	0.000	
Note: compared with control group, P<0.05.		

Comparison of postoperative quality of life between the two groups

There was no significant difference in preoperative SF-36 scores between the two groups (P>0.05). There was significant difference in postoperative SF-36 scores between the two groups (P<0.05). See Table 6.

Incidence of postoperative adverse events in both groups

The incidence of adverse events in the observation group was lower than that in the control group (P<0.05). See Table 7.

Evaluation of patient satisfaction with nursing in both groups

The nursing satisfaction of the observation group was higher than that of the control group (P<0.05). See Table 8.

Discussion

Hysteromyoma is a common disease that harms women's health. Although surgical treatment remains the preferred method, the surgical trauma inevitably impacts patients' prognosis[11]. Therefore, it is important to innovate the conventional surgical nursing mode and seek the surgical nursing mode that can accelerate patients' postoperative recovery[12]. Therefore, how to improve the outcome of patients undergoing laparoscopic myomectomy has become the focus of clinical nursing[13]. The MCM operation room model is a new and patient-centered model, which can effectively integrate various medical resources[14], improve the working efficiency by assembling a multidisciplinary, fixed and mutually helpful nursing team[15], comprehensively consider many problems that may exist before and after operation, and provide professional solutions, so as to optimize the surgical treatment process and promotes postoperative recovery[16]. At present, the MCM model has been

applied in clinical practice. Relevant studies show that the MCM model has achieved a good effect in the treatment of diabetes mellitus[17, 18]. However, there are very few reports on the application of the MCM model in myomectomy[19].

Based on many years of working experience in our hospital, a multidisciplinary collaborative group including gynecology department, operation room, anesthesiology department, blood transfusion department, psychology department, rehabilitation department and nutrition department was established to provide comprehensive guarantee for patients with hysteromyoma including diagnosis, treatment, rehabilitation and psychological counseling from pre-operation, intra-operation and post-operation20. The results of this study showed that the scores of ESCA in the observation group were higher than those in the control group 7 days after the operation, and those of HAMA and HAMD is lower than those in the control group 7 days after the operation. This was because the MCM model took the psychological conditions of the patients into account[21]. Pre- and post-operative psychological counseling was provided, along with enhanced disease awareness education[22], which helped the patients to correctly understand the operation of hysteromyoma and relieve the tension and anxiety[23,24]. Notably, the earliest postoperative ambulation activity time of the observation group was earlier than that of the control group. The comfort degree of ambulation activity of the observation group was superior to that of the control group. The hospital stay was shorter than that of the control group because the early rehabilitation and nutrition department intervention improved the immunity of patients[25], enhanced the ability to resist inflammatory reaction[26], accelerated the postoperative recovery of patients. Consequently, the incidence of postoperative complications was also reduced[27,28]. At the same time, the MCM model takes the patient as the center, so as to make the nursing work pay more attention to the patient's feeling, and to improve the patient's satisfaction[29].

In conclusion, the application of MCM in myomectomy can optimize the operation process, alleviate the patient's operation anxiety, promote the patient's postoperative rehabilitation, improve the patient's quality of life and improve the patient's satisfaction, and therefore, it is worth popularizing.

This study demonstrates that a multidisciplinary, optimized operation room process significantly improves outcomes for patients undergoing myomectomy, with the observation group showing better self-care ability, reduced anxiety/depression, earlier ambulation, shorter hospital stays, fewer complications, and higher satisfaction compared to routine care. This study employed a randomized controlled trial design, with a large sample size, uniform measurement standards for results, all of which enhanced the credibility of the research conclusions. However, potential selection biases, lack of long-term follow-up, and absence of cost-benefit analysis limited its wide applicability. For clinical practice, the results support integrating psychologists, nutritionists, and rehabilitation specialists into surgical teams to enhance recovery. Policymakers should consider reimbursement models and guidelines promoting multidisciplinary care, while future research should focus on long-term outcomes, cost-benefit analysis, and blinded trials to further validate these benefits. Ultimately, adopting this team-based approach could optimize myomectomy outcomes, making it a promising model for gynecological care.

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Authors' contributions

Hongwen Xu and Hui Yu conceptualized this study. Hongwen Xu, Hui Yu, and others contributed to the literature review. Hui Yu, Hongwen Xu, and others worked on the data analysis and interpretation of results. All authors participated in the discussion of the findings. All authors read and approved the final manuscript.

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Declaration of conflicting interests

The authors declare no competing interests.

Ethical considerations

This study was approved by the Institutional Ethics Committee of Ningbo University Affiliated

Yangming Hospital (Yuyao People's Hospital) (Approval No. 2025-06-033). All participants provided written informed consent. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki.

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