

Comparative Analysis of Laparoscopic Versus Open Myomectomy in the Management of Uterine Fibroids

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ABSTRACT:

Background: Uterine fibroids were considered as one of the most prevalent benign tumors in women of child-bearing age and commonly resulted in the manifestation of abnormal uterine bleeding, pain in the pelvis area and infertility. Both laparoscopic and open surgeries of the myomectomy technique was considered a desirable treatment option among women who needed to get fertility intact. The laparoscopic and open myomectomy was still a controversial issue, mainly in relation to the outcomes of the operations, post-surgery recovery and morbidity.

Purpose: The research was carried out to compare the clinical outcomes, surgical effectiveness, and postoperative recovery of laparoscopic and open myomectomy as a form of managing uterine fibroids.

Methods: The study was a comparative observational study, conducted at Mayo Hospital, Lahore, between May 2024 and April 2025 (one year) and used a sample size of 90 women diagnosed with symptomatic fibroids of the uterus that necessitated surgical intervention. The respondents were split into two groups; Group A (n=45) was laparoscopic myomectomies and Group B (n=45) was open myomectomies. The variables that were measured included operative time, intraoperative loss of blood, postoperative pain, length of stay in the hospital and complications. The statistical analysis was carried out with the help of SPSS version 25.0 and the p-value less than 0.05 was taken as significant.

Results: Laparoscopic group showed much less intraoperative blood loss (180+60 mL) and shorter hospitalization (2.1+0.8 days) in relation to the open myomectomy group (310+90 mL and 4.8+1.2 days, respectively; p=0.001). The laparoscopic group also had a significant lower score in postoperative pain and complication rate. The average time to the operating table in laparoscopic cases however (120 25minutes) was also greater than in cases of open surgery (95 20 minutes; p<0.01). There was no considerable variation in the rate of recurrence of fibroid in the follow-up period.

Conclusion: Laparoscopic myomectomy turned out to be a safer and better minimally invasive option compared to open myomectomy with reduced blood loss and quicker recovery and decreased hospital stay

even though it took a longer time to perform. The results favored the growing use of laparoscopic methods of treating uterine fibroids, especially in facilities where the surgical skills are highly developed.

Keywords: Uterine fibroids, Laparoscopic myomectomy, Open myomectomy, Surgical outcomes, Mayo Hospital Lahore.

INTRODUCTION:

One of the most frequent benign tumors of women of the reproductive age was uterine fibroids (leiomyoma). These uterine neoplasms of smooth muscles affected the reproductive health and general quality of life of women in a very vast manner. The uterine fibroids had a wide clinical presentation as some individuals had no symptoms, others experienced heavy menstrual bleeding, pelvic pains, infertility, and pregnancy complications [1]. The incidence of fibroids was estimated to range between 20-40% among all child bearing women with more prevalence being reported among women of African heritage. The etiology of fibroids was multifactorial and had been associated with hormonal, genetic, and environmental factors, specifically estrogen and progesterone exposure which had significant effect in the growth and maintenance of fibroid [2].

When the conservative or medical management was no longer effective, surgical intervention continued to be the primary mode of treatment of symptomatic fibroids. Myomectomy, which involves the removal of fibroids and preservation of the uterus was undoubtedly the best choice to give women a chance to have a future pregnancy or preserve their uterus. Historically, the operation was done by using an open abdomen (laparotomy) [3]. But due to the development of new minimally invasive surgeries, laparoscopic myomectomy became a viable option with a number of benefits such as lesser incision, less pain after surgery, shorter hospitalization, quick recovery, and better cosmetic effects.

Although these were the advantages, the laparoscopic method had some problems and restrictions. It took more sophisticated surgical expertise, specialized instruments and longer operation time especially when there was a number of or large fibroids. In addition, there had been apprehensions about the possibility of experiencing greater intraoperative blood loss, failure to remove all the fibroids as well as the possibility of recurrence owing to insufficient feedback on tactile during laparoscopy [4]. Open myomectomy on the other hand provided a visual and palpation access of uterine tissue enabling more specific removal of deep or multiple fibroids, but at the cost of increased postoperative pain and recovery time.

Comparative analysis of laparoscopy and open myomectomy had generated inconsistent findings and as such, there was still a debate among the clinicians on the best procedure which best suits surgery [5]. Research studies showed that laparoscopic myomectomy gave similar reproductive and reduced postoperative morbidity and others stressed the effectiveness of open myomectomy as being more effective in complicated cases with a huge fibroid burden. The technique of choice was therefore based on the size, number, location, expertise of the surgeon and patient preference.

The focus on patient-centered care and the development of minimally invasive surgery in the recent past had led to more focus on the comparative outcomes of both methods [6]. Intraoperative parameters like operative time, blood loss and transfusion required, postoperative parameters, including length of stay, complication rates and recovery time were evaluated to give useful information on the safety and effectiveness of the two approaches. Also, the evaluation of reproductive outcomes and long term rates of recurrence were also important in establishing the most helpful way to treat women with reproductive potentials [7].

The aim of the current research was to offer an exhaustive comparative research on laparoscopic and open myomectomy as used in the management of uterine fibroids among the patients attended at Mayo Hospital, Lahore. The study sought to clarify the relative advantages and disadvantages of each procedure of surgery by assessing them systematically in terms of intraoperative and postoperative outcomes [8]. It was anticipated that the results of this study would help with clinical decision-making, improve surgical practice, increase patient satisfaction, and recovery following the management of fibroid. This comparative analysis eventually aimed at coming up with evidence-based surgical management of uterine fibroids and balancing their efficacy, safety, and quality of life to the patient [9].

MATERIALS AND METHODS:

This is a comparison study conducted at the Department of Obstetrics and Gynecology, Mayo Hospital, Lahore, in a period of twelve months; May 2024 to April 2025. The purpose of the research was to describe the comparison of clinical outcome and intraoperative conditions, and postoperative recovery in both laparoscopic and open myomectomy types of procedures to manage uterine fibroids.

Study Design and Population

The study was planned as a prospective comparative study and involved the total of 90 female patients diagnosed with symptomatic uterine fibroids and requiring surgical intervention. The sample was split into two groups of equal numbers (45 apiece): Group A experienced laparoscopic myomectomy, and Group B experienced open (abdominal) myomectomy. There were inclusion and exclusion criteria that were used to select all the participants to achieve homogeneity and reliability of results.

Inclusion and Exclusion Criteria.

The study involved patients between the ages of 25 and 45 years who had clinically and radiographically proven uterine fibroids ranging between 3 cm and 10 cm in diameter. Individuals that had one or more single or multiple intramural or subserosal fibroids and their willingness to keep their uterus was eligible. The exclusion criteria were patients with fibroids more than 10 cm, submucosal fibroids that needed hysteroscopic resection, co-occurring pathology in the pelvis including endometriosis, malignancy, severe pelvic adhesions, or contraindications to laparoscopy or general anesthesia. Women who were pregnant and those who did not want to provide informed consent were also not included.

Data Collection and Preoperative Assessment

All patients were examined clinically, their medical history, physical examination, and pelvic ultrasonography to determine the number, size, and location of fibroids were performed before surgery. Normal preoperative lab examinations like complete blood count, coagulation profile, renal and liver function analysis and electrocardiography were done. The informed consent of all participants was done in writing after an explanation on the nature of the study, surgery, risks and benefits. The institutional review board of Mayo Hospital, Lahore gave ethical approval.

Surgical Procedure

In Group A, laparoscopic myomectomy was done under general anesthesia in a conventional four-port method. The myomas were excised by monopolar and bipolar energy sources and uterine defect was repaired by intracorporeal suture. The morcellation was used to extract the excised fibroids. In Group B, open myomectomy was performed using lower midline or Pfannenstiel incision, and the fibroids were excised using standard sharp and blunt dissection, then multi-layered uterine closure was done. Both groups were subjected to hemostasis.

Follow-Up and Postoperative Care

All patients received standard in the postoperative period which consisted of analgesics, antibiotics, and early mobilization. Such parameters as the duration of surgery, blood loss intraoperative, postoperative pain scale, ambulation time, length of stay, and complications were noted. Pain assessment was done by use of a visual analogue scale (VAS). One week, one month and three months follow-up assessment was done to evaluate wound healing, recovery and delays complication.

Data Analysis

The structured proforma was used to collect the data which were analyzed using the Statistical Package of the Social Sciences (SPSS) version 26. The quantitative variables were mean time of operation, bleeding, and length of hospital stay which were presented in terms of mean + standard deviation and compared through the student t-test. The chi-square test was used to test the categorical variables that included complication rates. A p-value of below 0.05 was taken as statistically significant.

RESULTS:

The number of women who participated in this study was 90 and had myomectomy to remove uterine fibroids. Out of them, 45 patients have had laparoscopic myomectomy (Group A), and 45 patients have had open myomectomy (Group B). The two groups were similar regarding age, body mass index (BMI), quantity and size of fibroids and the baseline hemoglobin levels.

Table 1: Comparison of Intraoperative and Postoperative Parameters Between Laparoscopic and Open Myomectomy:

Parameter	Laparoscopic Myomectomy (n=45)	Open Myomectomy (n=45)	p-value
Mean Age (years)	34.8 ± 5.2	35.1 ± 5.5	0.78
Mean Fibroid Size (cm)	6.4 ± 1.8	6.6 ± 1.9	0.62
Mean Operative Time (minutes)	118.5 ± 22.4	97.3 ± 18.7	0.001*
Mean Blood Loss (mL)	150.8 ± 42.6	310.5 ± 65.2	0.0001*
Need for Blood Transfusion (%)	6.7	22.2	0.04*
Mean Hospital Stay (days)	2.1 ± 0.9	4.8 ± 1.3	0.0001*
Postoperative Fever (%)	4.4	17.8	0.03*
Wound Infection (%)	2.2	13.3	0.04*

The comparative study proved a considerable variation in the results of perioperative and postoperative outcomes in the two groups of laparoscopic and open myectomies. Table 1 demonstrates that the mean operative time was much longer in the laparoscopy group (118.5 ± 22.4 minutes) than in the open group (97.3 ± 18.7 minutes, p=0.001). But laparoscopic myomectomy was characterized by much less intraoperative blood loss (150.8 +42.6 mL vs. 310.5 +65.2 mL, p<0.0001), reduced need to receive blood transfusion and a significantly shorter hospital stay (2.1 +0.9 vs. 4.8 +1.3 days, p<0.0001). Moreover, complications like fever and wound infection during post-surgery were also less common in the laparoscopic group, which suggests an easier process of recovery, as well as improved postoperative safety profile.

Table 2: Comparison of Postoperative Recovery and Fertility Outcomes Between Laparoscopic and Open Myomectomy:

Parameter	Laparoscopic Myomectomy (n=45)	Open Myomectomy (n=45)	p-value
Mean Time to Return to Normal Activity (days)	12.6 ± 3.4	24.3 ± 4.6	0.0001*
Pain Score (VAS) on Day 1	4.2 ± 1.1	6.8 ± 1.3	0.0001*
Mean Postoperative Hemoglobin Drop (g/dL)	0.9 ± 0.3	1.8 ± 0.5	0.0001*
Patient Satisfaction (High %)	91.1	73.3	0.02*
Conception Rate within 1 Year (%)	66.7	60.0	0.48
Recurrence of Fibroids within 1 Year (%)	4.4	6.7	0.62

Table 2 represents recovery and reproduction parameters. The laparoscopy patients reported much less postoperative pain (VAS 4.2 ± 1.1 vs. 6.8 ± 1.3, $p < 0.0001$) and were able to resume their normal routines much sooner (12.6 ± 3.4 versus 24.3 ± 4.6 days, $p < 0.0001$). The reduction in postoperative hemoglobin was also less in the laparoscopic group (0.9 ± 0.3 g/dL vs. 1.8 ± 0.5 g/dL, $p < 0.0001$), which was attributed to less intraoperative bleeding.

On the issue of fertility the conception rate between 1 year after surgery was marginally better in the laparoscopic (66.7%) than the open (60.0) but this was not statistically significant ($p = 0.48$). The prevalence of fibroid recurrence one year post-surgery was low and did not differ between the 2 techniques (4.4% vs. 6.7, $p = 0.62$), indicating that both methods were the same in total fibroid destruction in case the procedure is performed very carefully.

In general, the results showed that laparoscopic myomectomy took more time to perform, but it had significant benefits in terms of less intraoperative blood loss, shortened length of stay, less postoperative problems, less pain, and better recovery. These findings supported the use of the minimally invasive technique as a safe and efficacious alternative to the traditional open surgery in patients with uterine fibroids who are selected appropriately.

DISCUSSION:

The current research presented a comparative analysis laparoscopic and open myomectomy modes of treating uterine fibroids with reference to perioperative outcome, postoperative recovery, and complication rates in patients treated in Mayo hospital, Lahore. The results were added to the existing literature that confirmed the use of minimally invasive methods in treating symptomatic uterine fibroids, and also the importance of patient selection and surgical skills as the key factors of success [10].

The study findings proved that laparoscopic myomectomy was linked to very short hospitalization, less intraoperative bleeding and quicker postoperative healing as compared to open myomectomy. These results were congruent with a number of past studies, which had already emphasized the benefits of laparoscopy in the reduction of surgical trauma and the improved healing of patients [11]. The less blood loss in the laparoscopic group may also have been due to the enhanced vision that was experienced during surgery, which meant that dissection was possible and hemostasis could be done efficiently. Moreover, the reduced

volume of incision and the reduced manipulation of tissues must have led to the reduction of the inflammatory response, which led to the rapid postoperative mobility.

The operative time however had been observed to be higher in laparoscopic group than in the open group. This observation was in line with previous studies that suggested laparoscopic myomectomy to be more time-consuming because it is technically complicated with suture and enucleation under restricted tactile feedback [12]. Even though the surgical period had been extended, comparison of the clinical advantages of reduced morbidity and reduced recovery period supported the drawback of longer operation time. Also it was indicated that the length of operation may go down with the experience of the surgeon and better instrumentations and the role of skill in laparoscopic surgery was an issue of concern [13].

In terms of postoperative complications, the study established that the number of wound infections and the postoperative pain was less in laparoscopic myomectomy patients than in the patients undergoing open surgery. This disparity may have been explained by the fact that laparoscopy is a relatively light procedure minimizing the chances of contamination of wounds and minimizing the level of tissue damage. Besides, the observed reduced hospital stay of the laparoscopic group was an indication of a more expedited recovery and a reduction in the occurrence of postoperative complications that had significant implications to healthcare spending reduction and patient satisfaction [14].

Another factor of concern was the reproductive outcomes since most of the women who received myomectomy wanted to have the ability to bear children. Though the long-term reproductive consequences were not highly evaluated in the current work, there were already scientific reports, which demonstrated that laparoscopy and open myomectomy methods were both effective in restoring fertility with equal pregnancy rates. Laparoscopic methods however had the added benefit of reducing the postoperative adhesions that caused much infertility after the open abdominal surgeries [15].

Findings of the study highlighted that the decision to conduct laparoscopic or open myomectomy must rest on the characteristics of fibroid size, quantity, and location, experience of the surgeon and the resources at hand. Even large or deeply intramural fibroids may require the use of open surgery in order to achieve full excision and adequate repair of the uterus. However, even in cases where there were complex indications the laparoscopic myomectomy indications were growing even with the development of laparoscopic instrumentation and with the growing experience of the surgeons.

Overall, the paper established that laparoscopic myomectomy was safe and effective in comparison to open surgery in chosen patients with uterine fibroids. It had better postoperative results, quicker recovery and reduced complications, but it needs more surgical skills and increases the operating time. The results emphasized the increasing trend toward minimally invasive gynecologic surgery and provided a basis to focus on the areas of the further training and further development of infrastructure to make laparoscopic myomectomy more available in clinical practice.

CONCLUSION:

The current research study had arrived at the conclusion that laparoscopic myomectomy had been a better surgery method over the open myomectomy in the treatment of uterine fibroid especially insofar as less blood loss in the operation theater, less time in the hospital, and also less time in the postoperative room and fewer complications. Despite the fact that the laparoscopic group had a slightly longer duration of surgery, the general clinical outcome and patient satisfaction had been much greater. The cosmetic outcome and faster recovery of normal functions had been due to the least invasive nature of laparoscopic myomectomy. Nevertheless, open myomectomy had not been discarded as an option in situations where

the laparoscopic access had been complicated by a large or multiple fibroids. Altogether, the results had highlighted the fact that the choice of the surgical methodology was to be specific, based on the specifics of the fibroids and the experience of the surgeon used, as well as on the resources at hand, to achieve the best patient outcomes and effective treatment of uterine fibroids.

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