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Laparoscopic myomectomy is safe in patients with previous abdominal surgery

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ABSTRACT

Aims: The excision of myomas is commonly carried out in symptomatic women who choose to preserve their uterus, either using an open or minimally invasive (hysteroscopy, laparoscopy, robotic) approach. Patient selection is a critical factor in achieving a successful laparoscopic myomectomy. Prior abdominal surgery was not defined as a risk factor, however, the safest approach in these cases is still the subject of intense debate The aim of this study was to evaluate the safety of laparoscopic myomectomy in patients with previous abdominal surgery.

Methods: A retrospective cohort study was conducted on the files and operative notes of the patients who underwent laparoscopic myomectomy operation in a university-hospital based gynaecology department between January 2012 and March 2017. The patients were classified into two groups; Group 1 consisted of 34 patients who had previously undergone abdominal surgery, whereas the Group 2 comprised 118 patients who had not undergone any abdominal surgery.

Results: There were no significant difference between patients with and without a history of abdominal surgery in terms of operation time, postoperative hospital stays, blood loss, rate of operative complications, or conversion rate to open surgery.

Conclusion: A history of abdominal surgery seems to have no negative impact on the safety of a subsequent laparoscopic myomectomy.

Keywords: Laparoscopy, myomectomy, surgical outcome, minimal invasive surgery

INTRODUCTION

Uterine myomas are prevalent non-malignant neoplasms of the female reproductive system, with a lifetime incidence rate of roughly 70% to 80% prior to the onset of menopause.[1] Uterine leiomyomas are the most prevalent pelvic tumor in females and can lead to considerable morbidity, such as abnormal uterine bleeding, pelvic or abdominal pain, or subfertility.[2] The excision of myomas is commonly carried out in symptomatic women who choose to preserve their uterus, either using an open or minimally invasive (hysteroscopy, laparoscopy, robotic) approach.

In 1977, the first laparoscopic myomectomy was performed.[3,4] The laparoscopic approach to myomectomy has significant advantages like less postoperative pain, a reduced incidence of postoperative fever, and a shortened hospital stay.[5] However, this could result in prolonged time spent in the operating room. Additional possible benefits associated with the laparoscopic treatment encompass a shortened healing period, facilitating a faster resumption of occupational duties and engagement in routine daily tasks.[6]

The effectiveness of laparoscopic myomectomy refers to a surgical treatment that is minimally invasive and does not require conversion to laparotomy. This procedure aims to completely and safely remove specifically chosen myomas using surgical excision. The successful execution of laparoscopic completion of the treatment, without encountering significant difficulties, is contingent upon the adherence to more stringent selection criteria in comparison to those employed in open surgery. The laparoscopic method is considered more favourable for women with a limited number of myomas, whereas open surgery continues to be the preferred procedure for women with numerous and big myomas.

Patient selection is a critical factor in achieving a successful laparoscopic myomectomy. There are presently no widely accepted screening criteria for identifying women who are candidates for laparoscopic

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myomectomy. However, the following characteristics of a leiomyoma were linked to serious complications: >5 cm in diameter, >3 myomas removed, lie down on intraligamentous site. Prior abdominal surgery was not defined as a risk factor but one and only bowel injury occurred in a patient with previous surgery.[7] Additionally, abdominal surgery has been identified as one of the most significant risk factors for abdominal wall adhesions.[8] A history of laparotomy is no longer a contraindication to laparoscopy, but the safest approach in these cases is still the subject of intense debate.[9]

The aim of this study was to evaluate the safety of laparoscopic myomectomy in patients with previous abdominal surgery.

METHODS

The study was carried out with the permission of Ankara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 14.10.2021, Decision No: 08-230-21). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki. In our study, no interventional procedures were performed on the patients, and the research was conducted through file records.

Patient Selection

A retrospective cohort study was conducted on the files and operative notes of the patients who underwent laparoscopic myomectomy operation in a university-hospital based gynaecology department between January 2012 and March 2017. There were no specific criteria for inclusion in the study. In our department, laparoscopic approach is generally recommended for patients who are in premenopausal period, have 5 or less intramural/submucous fibroids and dominant fibroid size is less than 12 cm. In the presence of subserosal fibroids larger than 12 cm, laparotomic surgery is prioritized because sufficient space to allow intraabdominal manipulation of laparoscopic surgical instruments is not always provided.

During the preoperative period, each patient is evaluated with bimanual pelvic examination and 2 dimensional transabdominal or transvaginal ultrasonography. Magnetic resonance imaging (MRI) was ordered selectively in patients with ultrasonographic findings suggestive of malignancy. A laparotomic approach is recommended if the shape or borders of the fibroid are irregular, and/or if Doppler ultrasonography or MRI reveals high risk of malignancy. The entirety of the procedures was executed by gynaecologic surgeons who are certified for minimally invasive surgical procedures.

For each individual age, body mass index (BMI), parity, preoperative and postoperative haemoglobin value, diameter of the largest myoma removed from a single patient (based on preoperative imaging result), number of myomas removed, surgery duration, requirement of blood transfusion and conversion to laparotomy were recorded.

Laparoscopic Myomectomy

Each patient was evaluated with laboratory and radiological findings by the responsible anaesthesiologist 1 day before surgery. The surgical procedure was performed similarly in each patient. Surgical site prophylaxis with intravenous 2 g cefazolin (<120 kg, 3 g if >120 kg) or 900 mg clindamycin and 5 mg/kg gentamicin in case of penicillin allergy was performed 30-60 minutes before the operation. Following induction of general anaesthesia, a Foley catheter was inserted for bladder catheterisation. A simple uterine manipulator (Vcare manipulator; ConMed Corporation, Utica, NY) was placed in patients with a history of sexual intercourse. The decision of whether the abdominal access was closed (Veres needle or direct trocar) or open technique was made by the attending surgeon. In the presence of a vertical incision in the anterior abdominal wall due to previous abdominal surgeries, access to the abdomen was provided through the Palmer point. If the size of the uterus reached the level of the umbilicus, the 10 mm trocar required for the telescope was entered from the Lee-Huang point, and if the uterus was limited to the pelvis, a 10 mm trocar was entered from the umbilicus. Two 5 mm lateral trocars and one 5 mm left upper quadrant trocar were placed as accessory trocars. Haemostatic agents such as tourniquet, oxytocin or vasopressin were not used in any patient. First incision to the serosa of the uterus was done after bipolar coagulation of the incision site, with either monopolar diathermy or ultrasonic energy (Ethicon Harmonic Scalpel; Johnson&Johnson, New Brunswick,NJ). If endometrial cavity is encountered during enucleation, the cavity was first repaired with synthetic absorbable 2/0 or 3/0 sutures and then the myometrium was closed in multi-layered fashion with 1-0 polyglactin sutures or barbed sutures (V-Loc 180, Medtronic, Minneapolis, MN). Fibroids were removed from the abdomen with the help of an endobag and/or electromechanical morcellator (Rotocut G1; Karl Storz, Tuttlingen, Germany). After the abdominal cavity was washed with isotonic serum, haemostasis was checked with bipolar cautery and no antiadhesive barriers were applied. If the port site was >10 mm, the rectus sheath was repaired separately and the operation was terminated.

Postoperative Care

Hemogram control was routinely requested from all patients at the 8th postoperative hour. Mechanical prophylaxis with pressure stockings was routinely applied to each patient to reduce the possibility of deep vein thrombosis and/or pulmonary embolism. In the presence of additional risk factors, low molecular weight heparin prophylaxis at a dose appropriate for the patient's weight was added to the medical treatment plan. All low molecular weight heparin administrations were performed after hemogram control at postoperative 8th hour. The urinary catheter was withdrawn on postoperative day 1. Patients were discharged with recommendations following the return of bowel movements.

The patients were classified into two groups; Group 1 consisted of 34 patients who had previously undergone abdominal surgery, whereas the Group 2 comprised 118 patients who had not undergone any abdominal surgery. Previous abdominal surgery was described as having had any form of open or laparoscopic abdominal surgery in the past.

Statistical Analysis

Statistical analysis was performed using SPSS version 21. The conformity of the variables to normal distribution was analysed by histogram plots and Kolmogorov-Smirnov test. Mean, standard deviation and median values were used to present descriptive analyses. Student's t test or Mann-Whitney U-test was used to compare independent groups and Pearson chi-square test or Fisher's exact test was used to compare categorical variables. $P < 0.05$ was accepted as statistical significance.

RESULTS

During the study period, a total of 425 myomectomy procedures were performed. One hundred fifty-two of these women were treated with a laparoscopic myomectomy. The mean age of the whole study population was 36.6±6.43 years, the mean body mass index was 27.6±4.19 kg/m² and 101 women (66%) were nulliparous. Indications for myomectomy were abnormal uterine bleeding in 98 cases (64.5%), infertility or recurrent pregnancy loss in 36 cases (23.7%), and pelvic pain in 18 cases (11.8%). Table 1 shows the demographic characteristics of the participants. No statistical difference was observed between the groups in terms age, BMI and parity. Table 2 summarizes the number and categories of previous abdominal operations.

Table 1. Demographics of the patients

	Patients undergone L/S myomectomy (n=152)
Patient Characteristics	
Age, years, mean±SD	36.6±6.43
BMI, kg/m² , mean±SD	27.6±4.19
Nulliparity, n (%)	101 (66)
Indications, n (%) -abnormal bleeding -infertility/recurrent pregnancy loss -pelvic pain	 98 (64.5) 36 (23.7) 18 (11.8)
Dominant leiomyoma size, cm, mean SD -pre-operative scan-	6±2.9
Surgical outcomes	
Operation time, minutes, mean±SD	87.3±43.9
Hemoglobin drop, g/dl, mean±SD	1.5±0.9
Extracted myoma >10cm, n (%)	23 (15.1)
Multiple myomectomy, n (%)	44 (28.9)

Table 2. The number and categories of previous surgeries

	Patients with previous surgery (n=34)
Previous surgeries, n (%)	
Cesarean Section	9 (26.5)
Endometriosis	6 (17.6)
Laparoscopic/open	4/2
Myomectomy	6 (17.6)
Laparoscopic/open	1/5
Other Gynecologic	7 (20.6)
Other Non-gynecologic	3 (8.8)
Multiple Surgeries	3 (8.8)

The mean largest myoma diameter (according to preoperative scan) was 6±2.9 cm. In 23 cases (15.1%), a myoma >10 cm was extracted. Multiple myomectomy was performed in 44 cases (28.9%). In terms of surgical outcomes, the mean operative time was 87.3±43.9 minutes and the mean postoperative haemoglobin drop was 1.5±0.9 g/dl. In two patients (1.3%), the surgical procedure was completed with a laparotomy (one in Group 1; one in Group 2). One case was converted to open surgery due to uncontrollable bleeding, and had a dominant myoma> 15 cm with multiple myomas. Other case had a history of endometriosis surgery and conversion to laparotomy were decided due to excessive pelvic adhesions and impaired visualization. No major intraoperative complication was reported. The median duration of hospital stay after the surgery was two days (range:1-31). Histopathological examination revealed no leiomyosarcoma in any patient.

Groups were comparable in terms of myoma characteristics and intra- and post-operative outcomes (Table 3).

Table 3. Comparison of the patient and myoma characteristics and surgical outcomes between the groups

	Previous surgery (n=34)	No previous surgery (n=118)	P value
Patient demographics			
Age, years, mean±SD	36.6±5.0	36.0±6.7	0.623
BMI, kg/m², mean±SD	28.6±3.5	29.0±2.9	0.532
Parity, n (%)	0.5±0.7	0.5±0.8	0.938
Preoperative hemoglobin, g/dl, mean±SD	12.4±1.6	12.3±1.5	0.691
Surgical outcomes			
Postoperative hemoglobin, g/dl, mean±SD	11.0±1.2	10.9±1.6	0.898
Hemoglobin drop, g/dl, mean±SD	1.4±0.8	1.4±1.0	0.934
Total size, cm, mean±SD	10.5±9.6	7.8±5.9	0.039
Dominant leiomyoma size, cm, mean SD	6.0±2.5	5.8±2.8	0.752
Number of leiomyomas, cm, mean±SD	2.4±3.4	1.5±1.2	0.028
Duration of hospital stay, days, mean±SD	2.4±0.8	2.3±0.8	0.951
Operation time, minutes, mean±SD	55.9±19.7	56.9±34.9	0.870
Multiple leiomyoma, n (%)	14 (41.2)	30 (25.4)	0.074
Blood transfusion, n (%)	1 (2.9)	5 (4.2)	0.732
Conversion to laparotomy, n (%)	1 (2.9)	1 (0.8)	0.363

DISCUSSION

The current study examined the influence of previous abdominal surgery on the feasibility of performing laparoscopic myomectomy, and no negative effects were detected.

Prior abdominal surgery increases the risk of complications during initial entry to the abdominal cavity and necessitates adhesiolysis, which comes with its own set of complications in laparoscopic surgery. The incidence rate of access-related visceral injuries has been reported as 0.3-0.03%.[10-12] The likelihood of adhesions between the abdominal wall and intraabdominal organs is increased by a prior history of abdominal surgery.[13] Some surgeons avoid doing a laparoscopic operation on patients who have had prior abdominal surgery due to the risk of bowel damage during trocar insertion or impaired visualisation in the operative field due to adhesions. In our surgical procedures, we did not have any access related injury maybe liberal usage of the Palmer's point in patients with vertical incisions prevented this complication. Granata et al.[14] also found Palmer's point as a safe entrance area in their study similar to our observation in this study.

One of the most prevalent issues with laparoscopic myomectomy in the past was conversion to laparotomy. Dessolle et al.[15] reported a conversion rate of 14.8% on their study in 2001, but in the following years, the surgeon's experience increased, and in 2017, Mallick et al.[16] reported a conversion rate of 0.62%. Our conversion rate (1.3%) was slightly higher than Mallick et al.'s reported rate but similar to rates reported in other studies.[17,18] In our cohort, we finished myomectomy with open surgery in two cases, and one with extensive adhesions had a history of laparotomic endometriosis surgery. Tummers et al.[19] evaluated the effects of previous endometriosis surgery on subsequent endometriosis surgery in a recently published study. Laparotomic endometriosis surgery was found to be a risk factor for intraoperative complications in subsequent endometriosis surgery (OR 1.81, p = 0.045) rather than laparoscopic surgery. Studies involving a larger number of patients can further evaluate the impact of laparotomic endometriosis surgery on subsequent laparoscopic myomectomy.

Several researchers evaluated the feasibility of not a laparoscopic myomectomy but a total laparoscopic hysterectomy in patients with previous abdominal surgery. Although there are technical differences between the two surgical procedures, both require access to the peritoneal cavity and the removal of the uterus or myoma without damaging the adjacent organs. In the research by Seo et al.[20] the incidence of complications was comparable between the two groups (3.2 and 2.8%, respectively), and no bladder, bowel, or vascular injuries were observed. Similarly, in our study, we did not find any increased risk for blood transfusion, conversion to laparotomy, or injury to the adjacent organs in patients with previous abdominal surgery who subsequently had laparoscopic myomectomy.

Study limitations: The limited sample size of the current study, especially among patients who had previously had abdominal surgery, placed restrictions on its proficiency to do a subgroup evaluation for the identification of separate risk factors or numerous coexisting risk factors. In addition, because the retrospective nature of the study and obtaining complication rates on medical records and surgical notes, it is conceivable that recall ascertainment bias affected the results. To reduce the likelihood of a reporting bias, it is necessary to conduct additional research with complete reporting of all relevant outcomes, especially significant long-term outcomes, in large randomized controlled trials.

CONCLUSION

There were no significant difference between patients with and without a history of abdominal surgery in terms of operation time, postoperative hospital stays, blood loss, rate of operative complications, or conversion rate to open surgery. Therefore, a history of abdominal surgery seems to have no negative impact on the safety of a subsequent laparoscopic myomectomy.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Ankara University Faculty of Medicine Clinical Researches Ethics Committee (Date: 14.10.2021, Decision No: 08-230-21)

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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