

THE COMPARISON OF LAPAROSCOPIC MYOMECTOMY AND LAPAROSCOPIC ASSISTED MYOMECTOMY FOR THE SURGICAL APPROACH TO MYOMAS

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SUMMARY

Objective: to compare the intraoperative and postoperative short-term outcomes of laparoscopic and laparoscopically assisted myomectomy for the management of uterine myomas.

Design: Data from the files of the patients operated for uterin myomata were obtained and assessed. The cases operated directly with abdominal hysterectomy were excluded.

Setting: Abant Izzet Baysal University, Faculty of Medicine, Department of Obstetrics and Gynecology, Bolu

Patients: A total of 44 patients who admitted outpatient clinic of gynecology with the diagnosis of uterine myomatas and elected for laparoscopic surgical procedure.

Interventions: Laparoscopic and laparoscopically assisted myomectomy.

Main Outcome Measures: The association of surgical technique with patients' age, body mass index, parity, the size and number of myomas, intraoperative time, aspirated blood volume, intraoperative and postoperative complications and time of hospital stay.

Results: No significant difference were found between both groups in patient demographics, body mass index, intraoperative complications and hospitalization day. The size and number of myomas were significantly higher in laparoscopy assisted myomectomy group than the laparoscopic myomectomy group, respectively ($58,0 \pm 9,6$ vs $51,45 \pm 8,0$, $p < 0.05$; $1,79 \pm 0,76$ vs $1,45 \pm 0,58$ $p < 0.05$). Operation time and aspirated blood volume were significantly higher in laparoscopic myomectomy group than the laparoscopy assisted myomectomy group. (105 ± 15 vs $68, \pm 14$ $p < 0.05$; 372 ± 65 vs 266 ± 52 $p < 0.05$).

Conclusion: The collected data in our research did not show a superiority for laparoscopic myomectomy over laparoscopic assisted myomectomy. However, after obtaining the surgical instrumentation such as faster morcellators which decrease operation time and gaining surgical expertise, laparoscopic myomectomy will be a good surgical alternative to laparoscopically assisted myomectomy.

Key words: laparoscopic assisted myomectomy, laparoscopic myomectomy, myomas

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ÖZET

MYOMLARA CERRAHİ YAKLAŞIMDA LAPAROSKOPİK MYOMEKTOMİ YÖNTEMİNİN LAPAROSKOPİK YARDIMLI MYOMEKTOMİ YÖNTEMİ İLE KARŞILAŞTIRILMASI

Amaç: Myomların yönetiminde laparoskopik myomektomi ve laparoskopik yardımcı myomektomi yöntemlerinin intraoperatif ve postoperatif kısa dönem sonuçlarının karşılaştırılması.

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Planlama: Myom tanısı alarak ameliyat kararı verilen hastaların dosyalarına ulaşıldı ve ilgili veriler dosyalardan bulunarak kaydedildi. Doğrudan abdominal histerektomiye alınan vakalar ayrıldı.

Ortam: Abant İzzet Baysal Üniversitesi Tıp Fakültesi Kadın Hastalıkları ve Doğum Anabilim Dalı, Bolu.

Hastalar: Jinekoloji poliklinigine başvurusunda myoma uteri tanısı alan ve laparoskopik yolla ameliyat kararı verilen toplam 44 hasta.

Girisim: Laparoskopik myomektomi ve laparoskopik yardımcı myomektomi.

Degerlendirme parametreleri: Hasta yaşı, vücut kitle indeksi, doğum sayısı, myom büyüklüğü ve sayısı, intraoperatif zaman, aspire edilen kan miktarı, intraoperatif ve postoperatif komplikasyonlar ve hastanede yatış süresinin kullanılan cerrahi yöntemle ilişkisi.

Sonuç: Her iki gruptaki hastalar arasında hasta demografik değerleri, vücut kitle indeksleri, intraoperatif komplikasyonlar ve hastanede yatış süresi açısından anlamlı bir fark saptanmadı. Sırasıyla myom sayı ve çapı laparoskopik yardımcı myomektomi grubunda anlamlı olarak fazlaydı ($1,79 \pm 0,76$ vs $1,45 \pm 0,58$, $p < 0,05$; $58,0 \pm 9,6$ vs $51,45 \pm 8,0$, $p < 0,05$). Operasyon süreleri ve aspire edilen kan miktarı ise laparoskopik myomektomi grubunda anlamlı olarak fazlaydı. (105 ± 15 vs $68, \pm 14$ $p < 0,05$; 372 ± 65 vs 266 ± 52 $p < 0,05$).

Yorum: Çalışmamızda toplanan veriler laparoskopik myomektominin, laparoskopik yardımcı myomektomiye göre daha geçerli bir yöntem olduğunu göstermemekle birlikte hızlı morselatör gibi ameliyat süresini kısaltan ekipmanların elde edilmesi ve laparoskopik sütürasyon tekniğinin gelişmesiyle laparoskopik myomektomi, laparoskopik assiste myomektomiye iyi bir cerrahi alternatif olacaktır.

Anahtar kelimeler: laparoskopik myomektomi, laparoskopik yardımcı myomektomi, myoma uteri

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INTRODUCTION

Myomas are the most common benign tumors of the female genital tract that affect 25 to 40% of women of reproductive age⁽¹⁻⁴⁾. When the samples obtained from the patients who underwent hysterectomy were examined incidence of myomas increases up to 70%⁽²⁾. Despite this high incidence they are often asymptomatic and do not require a surgical procedure⁽⁵⁻⁸⁾. The common symptoms are excessive uterine bleeding and pelvic pain, however, recurrent miscarriages and premature births are some of the pathologies they cause^(9,10). Laparoscopic surgeons use laparoscopic interventions for myomas for nearly twenty years. Reduced morbidity and providing the return of the patient to daily activities in a short time have been reported as the benefits^(9,10). Laparoscopic myomectomy mainly includes the stages of separation of myoma from the uterus, reconstruction of the uterus and providing haemostasis, and removal of the myomas from the abdomen^(11,12). The procedure in laparoscopic-assisted myomectomy is the same as laparoscopic myomectomy except the removal of myoma via a small incision and putting sutures from there. It has been reported that it allows the palpation of the uterus, putting sutures easily and easy removal of the myomas from the abdomen⁽¹³⁻¹⁵⁾.

The aim of this study is to compare intraoperative and postoperative short-term results between laparoscopic myomectomy and laparoscopic-assisted myomectomy in surgical approach to myomas.

MATERIALS AND METHODS

In this study, the files of patients diagnosed with uterine myomas in gynecology outpatient clinic in Abant İzzet Baysal University School of Medicine, the Department of Obstetrics and Gynecology, between May 2007 and May 2009, were scanned. The patients that were treated surgically were defined. After the ones that were directly taken to the abdominal hysterectomy and the ones that turned to open myomectomy were separated, 44 case left were included in the study. 24 patients in the laparoscopic-assisted myomectomy group, 20 cases in the laparoscopic myomectomy group were included in the study. Comparison of intraoperative and short-term results between both groups was aimed. For this purpose, patients' demographic data, number and diameter of myoma, indications for surgery, operative time, intraoperative blood loss, postoperative change in hemoglobin levels, length of stay in the hospital, and early postoperative complications were recorded. Criteria for laparoscopic

myomectomy in our clinic are one or not more than three myomas smaller than 10 cm, and more than one myomas that do not exceed 5 cm. This criteria was reduced from 14 cm to 10 cm after 2 cases that required to return to open myomectomy because of uncontrollable diffuse bleeding. The criterion for laparoscopic assisted myomectomy was presence of multiple myomas exceeding 5 cm. This criterion was evaluated with preoperative transvaginal ultrasound measurement. Preoperative gonadotrophin analogues were not used because they complicate dissection and enucleation of the myomas from their cleavage. All patients were warned that a midline incision might be required if intraoperatively an unexpected tumor is diagnosed.

The age, body mass index, number of parity, size and number of myomas, intra-operative time, the amount of aspirated blood, intraoperative and postoperative complications (postoperative fever, anemia, ileus, blood transfusion), hospital stay, previous abdominal operations and surgical methods that were used for each patient included in the study were noted. All cases in the study were operated by the first and the second author. At the right side of the operation table, research assistant doctors took place as assistance.

Surgical Technique

After the placement of uterine manipulator (Ethicon ENDO-SURGERY ENDOPATH uterine manipulator, INC., CINCINNATI, USA) and urinary bladder catheter, providing pneumoperitoneum with the Verres needle, insertion of the umbilical optical trocar, and the placement of 5 mm laparoscopic trocars in the both lateral region of the lower abdomen for the laparoscopic myomectomy technique mainly uterine incision closest to the myoma, fixation of myoma with a teneculum or myoma auger (myoma screw, Karl Storz, tuttingen, Germany), separation of the myoma from the uterus, ensuring hemostasis with bipolar cauterization, providing reconstruction of the uterus and abdominal cavity and removal of the myoma with a morselator were applied^(11,12).

After the myometrial tissue surrounding myoma was infiltrated with a dilution of vasopressin (100 mL saline in 20 units (1 bulb)) via a 22 G amniocentesis needle in order to reduce bleeding, anesthesia was warned for the rare side effects of vasopressin (cardiac arrhythmia, pulmonary edema, myocardial infarction)^(12,16), and with a harmonic Ace (Ethicon ENDO-SURGERY, INC.,

CINCINNATI, USA.) or monopolar needle cautery serosa and then myometrium was incised. Because the possible diagonal course of arterier on the fundal myoma and since there is a possibility of injury independent of the incision direction⁽¹⁷⁾, incision was performed from the shortest path to reach the myoma without being tied to a particular direction. When the cleavage plane was reached myoma was delivered with a laparoscopic teneculum or auger, thus a complete enucleation was provided. After the bleeding was controlled using a bipolar cautery (Karl Storz, Tuttingen, Germany), myometrium and serosa was losed by two-story and spaced 1-0 polydioxanone sutures with extracorporeal technique. After the 5-mm trocar located laterally was placed with a 10-mm, the myoma was hold with a teneculum and taken out assisted by a morselator (Morcellex, Ethicon ENDO-SURGERY, INC., CINCINNATI, USA). The blood in the abdomen was aspirated and calculated after the total irrigation fluid was deducted from the measured amount. Afterwards, the abdomen was washed and a drain was placed from the right 5-mm trocar entrance, the process was terminated after the skin incisions of trocars were sutured.

With the laparoscopic-assisted myomectomy technique, following the placement of manipulator and trocars in the same way incision of serosa of the myoma and myometrium was performed. While the teneculum or myoma auger coming from one of the lateral trocars was pushing the myoma to the suprapubic region, entrance to this region was done with a 3-4 cm skin incision passing the skin and fascia, separating the rectus muscle. The myoma dircted the the incision with the teneculum was hold, enucleated, the uterus was palpated for other uterine myomas and the reconstruction of the uterus was achieved with 1-0 polydioxanone sutures. During the enucleation in case of entrance to the uterin cavity, the cavity was repaired with a 3-0 Vicryl suture (polyglactin 910, Ethicon, SpA). Afterwards the uterus was left in the abdomen and the aspirated blood volume in the abdominal cavity was calculated in the same way.

In both of the surgical techniques patients' bladder catheter was removed in the evening of the operation. Hb levels were viewed at the postoperative 6th hour and first day. The cases were mobilized in the evening of the surgery. Oral intake of liquid and solid were released as soon as bowel movements were heard in the postoperative first day. As postoperative pain killers pethidine (Aldolan Bulb, 2 ml, 50 mg/ml- Liba Pharmaceuticals industry) was routinely used twice a day, 100 mg IM.

The patients that were mobilized, whose bowel movements returned to normal, did not have fever or any signs of infection were discharged.

Early postoperative complications were noted as the reasons that required readmission to the hospital within thirty days following the discharge of the patient. The length of stay in the hospital was calculated from the date of operation to the date of discharge.

For statistical analysis, SPSS 12.0 (SPSS 12.0 demo, SPSS Inc., Chicago, Illinois) was used. The data were analyzed using t-test, Mann-Whitney U test and Fisher's exact test. For continuous parametric variables mean \pm standard deviation and for the non-parametric variables median values were used.

RESULTS

Demographic data of the patients are given in Table I. Number of the myomas and diameter of the myomas, respectively, are significantly higher in the laparoscopic-assisted myomectomy group compared to laparoscopic myomectomy group ((1.79 \pm 0.76 vs. 1.45 \pm 0.58, p <0.05 58.0 \pm 9.6 vs. 51.45 \pm 8.0, p <0.05). There was no significant difference between the groups in terms of other demographic characteristics.

Table I: Demographic and clinical features of the patients underwent laparoscopic assisted myomectomy or laparoscopic myomectomy.

Features	Laparoscopic assisted myomectomy	Laparoscopic myomectomy	P value
Number of patients (total=44)	24	20	
Age \pm SD	37,3 \pm 4,3	36,7 \pm 4,4	ns
Gravida	1,7 \pm 1,1	1,7 \pm 1,0	ns
Body mass index (kg/m ² , average \pm SD)	28,9 \pm 2,5	28,8 \pm 2,0	ns
Myomas total number	43	29	P< 0,05
average \pm SD	1,79 \pm 0,76	1,45 \pm 0,58	
Size of the myoma average of the diameter (mm; average \pm SD)(min-max)	58,0 \pm 9,6 (43-85)	51,45 \pm 8,0 (39-68)	P<0,05
Indication			
Abnormal uterin bleeding	15	12	ns
Infertility	5	4	ns
Pelvik pain	4	4	ns

The intraoperative short-term results of laparoscopic-assisted myomectomy group (n = 24) and laparoscopic myomectomy (n=20) group are given in Table II. Duration of the operation and amount of aspirated blood were significantly higher in the laparoscopic myomectomy group. (105 \pm 15 vs. 68, \pm 14, p <0.05; 372 \pm 65 vs. 266 \pm 52, p <0.05) In both of the groups the major indication for surgery was abnormal uterine bleeding (15/24 vs. 12/20), and there was no significant difference between groups (62% vs. 60%). Other indications in the groups were infertility (5/24 vs 4/20) and pelvic pain (4/24 vs. 4/20), respectively. Postoperative decrease in Hb value was significantly higher in the laparoscopic myomectomy group compared to laparoscopic-assisted myomectomy group (1.9 \pm 0.2 vs. 1.4 \pm 0.2, p <0.05). The recorded intraoperative complication in 2 cases was severe hemorrhage encountered in the base of the myoma. It was controlled with laparoscopic bipolar coagulation method. The only early postoperative complication was herniation of the omentum in the umbilical trocar-site observed in the laparoscopic-assisted myomectomy group. This complication was primarily repaired.

Table II: Intraoperative and short-term results of laparoscopic assisted myomectomy or laparoscopic myomectomy.

Results	Laparoscopic assisted myomectomy	Laparoscopic myomectomy	P value
Operation period	68 \pm 14	105 \pm 15	P< 0.05
Calculated volume of blood loss (ml; average \pm SD)	266 \pm 52	372 \pm 65	P<0.05
Intraoperative complications	0	2	ns
Intraoperative bleeding	0	2	
Postoperative hemoglobin decrease	1,4 \pm 0,2	1,9 \pm 0,2	P<0.05
Hospital stay	2,2 \pm 0,5	2,1 \pm 0,8	ns
Early postoperative complications	1	0	ns
Herniation of the omentum in the umbilical side	1	0	

DISCUSSION

In this study, intraoperative and short-term results of laparoscopic myomectomy and laparoscopic-assisted myomectomy were compared, operation time was

found significantly shorter ($68, \pm 14$ vs. 105 ± 15 , $p < 0.05$), the number (1.79 ± 0.76 vs. 1.45 ± 0.58 , $p < 0.05$) and size (58.0 ± 9.6 vs. 51.45 ± 8.0 , $p < 0.05$) of the myomas were significantly more, the intraoperative aspirated volume of blood (266 ± 52 vs. 372 ± 65 , $p < 0.05$) and postoperative hemoglobin decrease were found to be significantly less in the laparoscopic-assisted myomectomy group. There were no significant difference in hospital stay and other data observed.

In the literature, there is a limited number of prospective randomized trials comparing approaches to myomas, assisted laparoscopic myomectomy and laparoscopic myomectomy^(13,18,19). An important reason for this is that laparoscopic-assisted myomectomy is abandoned in many clinics. In the literature there are a number of studies advocating that laparoscopic myomectomy is the gold standard approach for myomas⁽²⁰⁻²²⁾.

Our findings showed that when the average number of myomas and mean volume of myomas increase laparoscopic-assisted myomectomy significantly shortens the operation time. It has been suggested that it provides palpation and removal of other myomas, prevents possible difficulties in endoscopic suturation and reconstruction of the myometrium⁽²³⁾. The increased number of measured myomas in the laparoscopic myomectomy group in our study is compatible to the ones in the literature^(19,23). The use of morselator while removing the myomas from the abdomen was a parameter that increases the operation time. During the aspiration of the last pieces of myoma caution should be paid for uncontrollable tissue rotation movement and the speed of the engine should be reduced.

The adequacy of reconstruction of the uterus in laparoscopic myomectomy is an issue that is being discussed and while there are studies reporting that better results could be achieved via minilaparotomy⁽²⁴⁻²⁷⁾ there are some other studies indicating that by the developing instrumentation safety of endoscopic suturing can be achieved^(21,22). In our study, there was no significant difference of the sutures between the groups in terms of safety during intraoperative period or early period. The use of monofilament structure for the extracorporeal suture should be considered, thus there could be the benefit of increasing slipperiness of the suture. If the intracorporeal suturing technique would be used multifilament sutures could be used, but

stretching the suture after every passage would enhance the effectiveness of hemostasis with this suture which does not have a slippery structure. Recently, commercially available V-loc (Covidien) might be a reliable choice that could be used and that could prevent the slip of the suture by its blade shape edge.

Even though, our study revealed that in the laparoscopic myomectomy group intraoperatively aspirated blood volume and postoperative decrease in hemoglobin level were significantly more than the other group which is an opposite of the studies in the literature reporting less blood loss and Hb decrease^(13,19,22,28,29) or no difference between the two groups, we believe that this is due to reconstruction of the uterus and in particular because of the time taken for the control of uterine bleeding. Except the stage that the tissue removal from the abdomen with morselator the most time consuming part of the operation is hemostasis of the surgery.

Cagnacci et al.⁽¹⁸⁾ reported that laparoscopic-assisted myomectomy is better than myomectomy with a minilaparotomy, because it provides a better hemostasis with endoscopic control of bleeding and debris in the pelvic cavity following the closure of the abdominal incision. Palomba et al compared laparoscopic myomectomy and myomectomy with a minilaparotomy for the reproductive results and did not find any significant difference between the two groups⁽²⁹⁾. Fanfani et al. compared laparoscopic treatment of uterine myomas versus myomectomy with a minilaparotomy in their randomized study, and reported that minilaparotomy might be an alternative to the laparoscopic approach in the treatment of intramural and subserosal myomas⁽³⁰⁾. Although the proposed size of abdominal incision by Nezhat et al.⁽³¹⁾ for the laparoscopic assisted myomectomy is 6-8 cm, in our clinic, 3-4 cm was a sufficient incision for wedge resections while removing the myomas from the abdomen or putting sutures if necessary. The advantage of the appropriate position of the myoma while bringing closer to the incision provided by the myoma auger is a factor that facilitates the intervention.

In their study with 37 patients diagnosed with leiomyosarcoma at the preoperative period, Perri et al. compared the the survival statistics of open myomectomy, laparoscopic hysterectomy assisted by a morselator and hysteroscopic myomectomy with the results of patients underwent total abdominal

hysterectomy as the first step, and reported that the increase in the survival rates of patients taken directly to the hysterectomy were statistically significant⁽³²⁾. Even though the use of morselator in clinical practice preoccupies the possibility of an incidental tumor spread, there are no randomized controlled trial on uterine sarcomas that has an annual incidence of 1 in 100,000 women and consists 9.7% of the uterine cancers. Despite this low probability it is important for the surgeon to be cautious and skeptical during the intra-operative approach.

In our study, there was no evidence showing that laparoscopic myomectomy is more valid than the laparoscopic-assisted myomectomy. However, the developed morselator devices would provide a secure and fast removal of the tissue, increased experience of surgeon's suture technique would enable a rapid control of bleeding. Dissection of the myoma's capsule done with a bipolar cautery before the increased intensity of the bleeding is an appropriate approach.

Retrospective design of the study limited the number of variables and control. Therefore, postoperative pain scores and return period of the bowel function was not recorded. The sample size of the study is limited as well. Despite these limitations our study is in accordance with the studies in the literature except the calculated blood loss and decrease in Hb levels.

We believe that laparoscopic-assisted myomectomy is a method that could be used if there is a lack of endoscopic instrumentation or when there is a difficulty of laparoscopic suturation or controlling the bleeding.

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