



COMPARISON OF THE RISK, BENEFIT AND PREGNANCY RATE OF LAPAROSCOPIC MYOMECTOMY AND TRADITIONAL LAPAROTOMY IN UTERINE FIBROIDS PATIENTS

Ahmed Dabash Abdel Lateef^{1*}, Ahmad Ali Mohamed Ahmad², Osama Ahmed Mohamed Ali³

^{1*}Department of Obstetrics and Gynecology, Faculty of Medicine, Suez University

²Department of General Surgery, Faculty of Medicine, Suez University

³Department of Obstetrics and Gynecology, Faculty of Medicine, South Valley University.

Abstract

Background: Laparoscopic myomectomy has emerged as an efficacious and safe treatment option for management of uterine fibroids.

Purpose: The objective of this research was to compare both the safety and effectiveness of traditional laparotomy and laparoscopic myomectomy for women with uterine fibroids, as well as to find out their impact on the pregnancy rate following surgery.

Methods: This retrospective study was conducted at (Omomah center for endoscopic surgery and El Shefaa Hospital) and encompassed 80 patients with uterine fibroids in the period between January 2017 and January 2020. Cases who had laparoscopic myomectomy have been placed in group A (number=40), while those who underwent traditional laparotomy have been placed in group B (number=40).

Results: A statistically significant variance has been observed among both groups regarding time of surgery ($p=0.039$), and incidence of complications ($p=0.03$). There were highly statistically significant variances among both groups according to intra operative blood loss, post-operative hospitalization and VAS score ($p<0.001$). Laparoscopic myomectomy had a higher rate of pregnancy than traditional laparotomy at various time points (6, 12, 24, and 48 months) following surgery.

Conclusion: Laparoscopic myomectomy had positive effects over traditional laparotomy in terms of shorter surgery time, postoperative hospital stays, less intraoperative blood loss, VAS score, and lower incidence of complications, as well as a higher pregnancy rate.

Keywords: Fibroids, Laparoscopic myomectomy, Pregnancy, Traditional laparotomy

Introduction

A frequently occurring innocent monoclonal tumour that affects women of reproductive years is uterine fibroids (UFs), also called uterine leiomyoma (Stewart et al., 2017). Based on the position as well as the dimensions of the UFs, patients with UFs consistently exhibit a variety of signs. The signs caused by UFs, such as heavy menstrual flow, extended periods of menstruation, and in extreme cases, the possibility of a woman developing chronic anemia, are more serious the closer the uterine fibroids are to the endometrium (Laughlin-Tommaso and Stewart, 2018).

Additionally, UFs may trigger infertility in female patients as well as pain in the pelvis frequent urination, pressure, and dilation, along with pain in the abdomen (Donnez and Dolmans, 2016).

The best course of action for symptomatic patients who want to maintain fertility is removal through surgery, or myomectomy (Sohn et al., 2018). Because of its smaller incisions, better aesthetic results, and quicker recovery after surgery, single-port laparoscopic surgery has become more popular in gynecological practice (Fouda et al., 2016). Laparoscopic myomectomy (LM) as well as laparoscopic assisted myomectomy (LAM) are minimally invasive surgical techniques that use tiny abdominal incisions to remove fibroids from the uterus. Conventional laparoscopic myomectomy, myomectomy with morcellation, as well as myomectomy with enucleation are the three primary forms of LM surgery (Glaser et al., 2018).

Laparoscopic myomectomy (LM) had a number of benefits over traditional laparotomy. According to certain research, laparoscopic myomectomy decreased hospitalizations and morbidity when contrasted with traditional surgical techniques (Venturella et al., 2016). As a whole, a myomectomy may supply substantial comfort to those suffering from uterine fibroids, restoring their standard of life and, in several instances, conserving their fertility (Wallace et al., 2020).

Patients and methods:

This retrospective research was performed at (Omomah center for endoscopic surgery and El Shefaa Hospital) and encompassed 80 patients with uterine fibroids who experienced lower abdominal pain and heavy menstrual bleeding. The patients were admitted between January 2017 and January 2020. Cases who had laparoscopic myomectomy have been placed in group A (number=40), while those who had conventional laparotomy have been placed in group B (number=40).

The work has been carried out in line with the Declaration of Helsinki, which serves as the World Medical Association's code of ethics for human subjects research. Each case gave written informed consent.

Inclusion criteria were cases diagnosed with uterine fibroids with symptoms of fibroid include lower abdominal pain, infertility, heavy menstrual bleeding, and recurrent abortion and following a gynecological evaluation. Age ranged between (25-50) years old. Patients were excluded if they were less than 25 or more than 50 years old, if they had 1ry tubal infertility or ovarian insufficiency, those with a past history of hemorrhagic sicknesses and conditions that prevent laparoscopy include severe obesity, large ventral hernias, abdominal infection, or poor cardiac function.

The selected patients underwent the subsequent steps: Clinical examinations for every system or local gynecological examinations, standard laboratory testing (liver function test, renal function test, complete blood count, bleeding profile), ultrasound scans (TVS and pelviabdominal), as well as calculation of blood loss based on López-Picado's formula.

Personal and family history, focusing on medical conditions, problems with pregnancy, the use of drugs, and habits related to lifestyle were gathered. Blood loss (ml) = $[\text{EBV} \times (\text{Hcti} - \text{Hctf}) + \text{transfused RBC volume}] / \text{Hct mean}$ (Jaramillo et al., 2020). Initial haematocrit (Hcti), final haematocrit (Hctf), and projected blood volume (EBV).

Patients with similar illnesses were compared for pain severity through the Visual Analogue Scale (VAS) (Heller et al., 2016).

Forty patients in group A underwent laparoscopic myomectomy. Abdominal endoscopy was done with a 10mm endoscope, camera, along with high-resolution monitor (Storz-France). Laparoscopic myomectomy had been carried out in all cases using non-invasive infertility surgery principles, including enlargement, cautious haemostasis, as well as saline irrigation. Before the operation, the case has been obligated to vacant the bladder, subsequently receive general anaesthesia, choose the bladder lithotomy position, and insert the indwelling catheter. To create a carbon dioxide pneumoperitoneum with a pressure of twelve to fourteen mmHg, a one centimeters incision has been created in the skin of the umbilicus margin. A pneumoperitoneum needle was then introduced. Next, a laparoscopy instrument had been introduced. Laparoscopy may stop myometrial fragmentation following interstitial myomectomy and reduce the likelihood of large area (above one square centimeter) adhesion by suturing a fine-closed uterine incision. The uterus has been divided

into 1 or 2 layers based on the extent of the incision, with either a 3-0 Vicryl (Polyglactine 910, 20 mm needle; Ethicon) or 4-0 PDS (Polydioxanon, twenty millimeters needle; Ethicon) suture. A single tooth retractor was used to enlarge the incision (20 mm) and eliminate the myoma by means of suprapubic puncture location. With laparoscopic supervision, a needle hub was used for closing the uterine incision through the suprapubic incision. Following surgery, the peritoneal cavity has always been drained with saline solution.

The forty patients in group B received traditional laparotomy treatment. Following anaesthesia, the patient was positioned supine, and a longitudinal incision was performed in the centre of the lower abdomen. Following slowly injecting twenty millilitres of normal saline and + 6 U of pituitrin into the myometrium, a blunt dissection was carried out along the surface of the myoma capsule until it reached an area with more basal blood vessels. Following clamping, the myoma has been eliminated and the myometrium and serosa were sutured.

Statistical analysis

Recorded information have been examined utilizing the statistical package for social sciences, version 23.0 (SPSS Inc., Chicago, Illinois, USA). The quantitative information has been represented as mean $\pm$ standard deviation and ranges when their distribution was parametric (normal) whereas non-normally distributed parameters (non-parametric information) have been expressed as median with inter-quartile range (IQR). Additionally, qualitative parameters have been represented as percentages and number. Information has been explored for normality utilizing Shapiro-Wilk Test and Kolmogorov-Smirnov.

Results:

The results of the current study are displayed in the following tables and figures:

Table (1) showed that the mean age of cases in group A was (38.58 ± 4.84) years and (39.10 ± 3.91) years in group B. The mean BMI in group A was (25.5 ± 2.08) and (25.14 ± 1.92) kg/m² in group B. A statistically insignificant variance has been observed among both groups regarding age and BMI (p equal 0.595 and 0.635, correspondingly). Also, were none statistically significant differences between both groups regarding smoking, HTN, DM and previous caesarean section (CS) (p=1.00, 0.751, 0.478, and 0.072 respectively).

The mean number of fibroids in group A was (1.29 ± 0.24) and (1.26 ± 0.22) in group B. The mean size of fibroids in group A was (6.28 ± 9.40) and (6.76 ± 9.57) cm in group B with none statistically significant variances among both groups (p equal 0.900 and 0.286).

Table (1): Baseline characteristics of the study groups

	Group A (number=40)	Group B (number =40)	P- value
Age (years)	38.58 ± 4.84	39.10 ± 3.91	0.595
Body mass index (BMI) (kg/m ²)	25.5 ± 2.08	25.14 ± 1.92	0.635
Smoking	1 (2.5%)	1 (2.5%)	1.000
History of hypertension (HTN)	17 (42.5%)	19 (47.4%)	0.751
History of diabetes (DM)	15 (37.5%)	12 (30.0%)	0.478
No. of fibroids	1.29 ± 0.24	1.26 ± 0.22	0.900
Size of fibroids (cm)	6.28 ± 9.40	6.76 ± 9.57	0.286
Previous CS	16 (40.0%)	17 (42.5%)	0.072

Table (2) showed that the mean time of operation in group A was (70.15 ± 28.32) and (77.28 ± 104.71) minutes in group B with statistically significant variances among both groups (p=0.039). There were highly statistically significant variances among both groups according to intra operative blood loss, post-operative hospitalization and VAS score (p below 0.001)

Table (2): Comparison of the surgical indicators between the study groups

	Group A (number =40)	Group B (number =40)	P- value
Time of surgery(minutes)	70.15 ± 28.32	77.28 ± 104.71	0.039
Intra operative blood loss(ml)	31.92 ± 16.75	51.64 ± 23.61	<0.001
Post-operative hospital stay (days)	8.45± 1.44	17.90 ± 1.42	<0.001
VAS score	2.05± 0.71	3.1± 0.79	<0.001

Table (3) showed statistically significant differences among both groups as regards the incidence of complications (p equal 0.03).

Table (3): Comparison of complications among the study groups

	Group A (number =40)	Group B (number =40)	P- value
Incidence	7 (17.5%)	27 (67.5%)	0.03
Urinary tract infection	2 (5.0%)	7 (17.5%)	
Incision pain	2 (5.0%)	13 (32.5%)	
Pelvic adhesion	3 (7.5%)	7 (17.5%)	

Table (4) illustrated statistically significant variances among both groups according to the pregnancy rate after surgery. In group A, 8 cases were pregnant at six months following operation, with a pregnancy rate of 20.0%; 19 at twelve months following operation, with a pregnancy rate of 47.5%; 29 at 24 months following operation, with a pregnancy rate of 72.5% and 37 were pregnant at 48 months following operation, with a pregnancy rate of 92.5%. In group B, two cases were pregnant at six months following operation, with a pregnancy rate of 5.0%; ten at twelve months following operation, with a pregnancy rate of 25.0%; 17 at 24 months following operation, with a pregnancy rate of 42.5% and 24 were pregnant at 48 months following operation, with a pregnancy rate of 60.0%. Group A had a significantly higher pregnancy rate than group B during the four time points examined (p below 0.05).

Table (4): Comparison of pregnancy rate among the study groups

	Group A (number =40)	Group B (number =40)	P- value
Six months post-operative	8 (20.0%)	2 (5.0%)	0.03
Twelve months post-operative	19 (47.5%)	10 (25.0%)	0.02
Twenty four months post-operative	29 (72.5%)	17 (42.5%)	0.01
Forty eight months post-operative	37 (92.5%)	24 (60.0%)	0.001

Discussion:

Laparoscopic myomectomy is an efficient management for fibroids, particularly for those who want to preserve their fertility (Andou et al., 2020). The purpose of this research was to compare laparoscopic myomectomy to conventional laparotomy techniques for managing uterine fibroids. Our research showed highly statistically significant variances among the study groups concerning intra operative blood loss, post-operative hospitalization and VAS score (p<0.001). According to earlier research, the laparoscopic myomectomy technique considerably decreased blood loss when compared to laparotomy (Ji et al., 2018; Choi et al., 2019). Additionally, patients who undergo laparoscopic myomectomy recover more quickly and effectively than those who undergo laparoscopy. Additionally, patients who underwent laparoscopic myomectomy possessed less lengthy hospital stays (Chen et al., 2014; D'Silva et al., 2018). In comparison to laparotomy, laparoscopic myomectomy may decrease pain following operation by successfully lowering the oxidative stress reaction of postoperative uterine fibroids (Tomasik et al., 2014). Laparoscopic myomectomy has been shown to be less painful than traditional laparotomy by Bhav Chittawar et al., (2014).

The present study results revealed lower incidence of complications in laparoscopic myomectomy group compared to traditional laparotomy group ($p=0.03$). Our findings are consistent with Sheyn et al., (2019) they reported that laparoscopic myomectomy had a lesser frequency rate of complications than traditional abdominal myomectomy.

The pregnancy rate for cases had uterine fibroids is typically extremely low (Sunkara et al., 2010), and that condition is limited to resolve by means of surgery. Following contrasting the pregnancy rates of the 2 groups at various time points (6, 12, 24, and 48 months) following operation, we observed that laparoscopic myomectomy had a higher rate of pregnancy than traditional laparotomy. These results were supported by Shen et al., (2015) who demonstrated that a laparoscopic myomectomy increased the pregnancy rate.

Considering the limitations of our research, due to the small sample size, identifying minor differences among open and laparoscopic myomectomy groups could have been challenging. The study's single-center design may limit its applicability to other communities or medical facilities.

Conclusion:

Laparoscopic myomectomy had positive effects over traditional laparotomy in terms of shorter surgery time, postoperative hospital stay, less intraoperative blood loss, VAS score, and lower incidence of complications, as well as a higher pregnancy rate.

REFERENCES

1. Andou, M., Yanai, S., Shirane, A., & Kanno, K. (2020). Laparoscopic Myomectomy. *Surgery journal* (New York, N.Y.), 6(Suppl 1), S35–S43.
2. Bhawe Chittawar, P., Franik, S., Pouwer, A. W., & Farquhar, C. (2014). Minimally invasive surgical techniques versus open myomectomy for uterine fibroids. *The Cochrane database of systematic reviews*, 2014(10), CD004638.
3. Chen, I., Lisonkova, S., Joseph, K. S., Williams, C., Yong, P., & Allaire, C. (2014). Laparoscopic versus abdominal myomectomy: practice patterns and health care use in British Columbia. *Journal of obstetrics and gynaecology Canada: JOGC = Journal d'obstetrique et gynecologie du Canada: JOGC*, 36(9), 817–821.
4. Choi, S. H., Hong, S., Kim, M., Bae, H. S., Kim, M. K., Kim, M. L., Jung, Y. W., Yun, B. S., & Seong, S. J. (2019). Robotic-assisted laparoscopic myomectomy: the feasibility in single-site system. *Obstetrics & gynecology science*, 62(1), 56–64.
5. Donnez J., Dolmans M. M. (2016). Uterine fibroid management: from the present to the future. *Hum. Reprod. Update*. 22(6):665–686.
6. D'Silva, E. C., Muda, A. M., Safiee, A. I., & Ghazali, W. A. H. W. (2018). Five-Year Lapsed: Review of Laparoscopic Myomectomy versus Open Myomectomy in Putrajaya Hospital. *Gynecology and minimally invasive therapy*, 7(4), 161–166.
7. Fouda, U. M., Elsetohy, K. A., & Elshaer, H. S. (2016). Barbed Versus Conventional Suture: A Randomized Trial for Suturing the Endometrioma Bed After Laparoscopic Excision of Ovarian Endometrioma. *Journal of minimally invasive gynecology*, 23(6), 962–968.
8. Glaser, L. M., Friedman, J., Tsai, S., Chaudhari, A., & Milad, M. (2018). Laparoscopic myomectomy and morcellation: A review of techniques, outcomes, and practice guidelines. *Best practice & research. Clinical obstetrics & gynaecology*, 46, 99–112.
9. Heller, G. Z., Manuguerra, M., & Chow, R. (2016). How to analyze the Visual Analogue Scale: Myths, truths and clinical relevance. *Scand. J. Pain*, 13(1), 67-75.
10. Jaramillo, S., Montane-Muntane, M., Gambus, P.L., Capitan, D., Navarro-Ripoll, R., Blasi, A. (2020). Perioperative blood loss: estimation of blood volume loss or haemoglobin mass loss? *J. Blood Transfus*, 18(1), 20.
11. Ji, L., Jin, L., & Hu, M. (2018). Laparoscopic Myomectomy with Temporary Bilateral Uterine Artery Occlusion Compared with Traditional Surgery for Uterine Myomas: Blood Loss and

- Recurrence. *Journal of minimally invasive gynecology*, 25(3), 434–439.
12. Laughlin-Tommaso S. K., Stewart E. A. (2018). Moving toward individualized medicine for uterine leiomyomas. *Obstet. Gynecol.* 132(4):961–971.
 13. Shen, Q., Chen, M., Wang, Y., Zhou, Q., Tao, X., Zhang, W., & Zhu, X. (2015). Effects of laparoscopic versus minilaparotomic myomectomy on uterine leiomyoma: a meta-analysis. *Journal of minimally invasive gynecology*, 22(2), 177–184.
 14. Sheyn, D., Bretschneider, C. E., Mahajan, S. T., El-Nashar, S., Billow, M., & Ninivaggio, C. S. (2019). Comparison of 30-day Complication Rates between Laparoscopic Myomectomy and Total Laparoscopic Hysterectomy for the Treatment of Uterine Leiomyoma in Women Older Than Age 40. *Journal of minimally invasive gynecology*, 26(6), 1076–1082.
 15. Sohn, G. S., Cho, S., Kim, Y. M., Cho, C. H., Kim, M. R., Lee, S. R., & Working Group of Society of Uterine Leiomyoma (2018). Current medical treatment of uterine fibroids. *Obstetrics & gynecology science*, 61(2), 192–201.
 16. Stewart E. A., Cookson C. L., Gandolfo R. A., Schulze-Rath R. (2017). Epidemiology of uterine fibroids: a systematic review. *Bjog.* 124(10):1501–1512.
 17. Sunkara, S. K., Khairy, M., El-Toukhy, T., Khalaf, Y., & Coomarasamy, A. (2010). The effect of intramural fibroids without uterine cavity involvement on the outcome of IVF treatment: a systematic review and meta-analysis. *Human reproduction (Oxford, England)*, 25(2), 418–429.
 18. Tomasik, P., Bomba-Opon, D., Krupniewski, L., Palczewski, P., & Wielgos, M. (2014). Evaluation of uterine myomas during pregnancy using magnetic resonance imaging. *Neuro endocrinology letters*, 35(4), 262–264.
 19. Venturella, R., Rocca, M. L., Lico, D., La Ferrera, N., Cirillo, R., Gizzo, S., Morelli, M., Zupi, E., & Zullo, F. (2016). In-bag manual versus uncontained power morcellation for laparoscopic myomectomy: randomized controlled trial. *Fertility and sterility*, 105(5), 1369–1376.
 20. Wallace K., Zhang S., Thomas L., Stewart E.A., Nicholson W.K., Wegienka G.R., Wise L.A., Laughlin-Tommaso S.K., Diamond M.P., Marsh E.E., et al. Comparative effectiveness of hysterectomy versus myomectomy on one-year health-related quality of life in women with uterine fibroids. *Fertil. Steril.* 2020; 113:618–626.