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Laparoscopic myomectomy vs. conventional myomectomy

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ABSTRACT
Myomectomy is a surgical procedure to remove uterine fibroids. It is recommended in symptomatic fibroids or when many results in complications. Those complications may be pelvic pain, heavy menstrual bleeding, pressure symptoms or infertility.
Laparoscopic myomectomyis one of the procedures used in management of uterine fibroids. Many studies studied that there were many advantages of laparoscopic myomectomy when compared to conventional myomectomy for treatment of uterine fibroids.
However, lack of training in such advanced laparoscopic procedure limits the widespread use of laparoscopic myomectomy. So, the surgeon`s skills in precise enucleation of the myoma and suturing the myoma bed are major deciding factors to perform laparoscopic myomectomy.

Keywords: myoma, Laparoscopic, pelvic pain, fibroids

INTRODUCTION

Uterine fibroids which are also known as myomas are the most common benign tumors in women of childbearing age. (protocol). They can be found in 70-80% of women during their life time.[(1)]
Although uterine myomas are usually asymptomatic, they may impact the quality of life due to different issues like infertility, bleeding and even miscarriage.[(2)]
Treatment options for uterine fibroids depend on many factors including age of the patient,reproductive status and severity of the condition. Based on FIGO staging, management of myomas can start from just observation and follow up (if myomas are small and asymptomatic) up to surgical intervention like myomectomy or hysterectomy[(3)].
Although symptoms of uterine fibroid can be relieved by medical treatment, surgery still considered the gold standard for women of childbearing age. Myomectomy can be performed via conventional approach (abdominal myomectomy) or laparoscopic approach[(4)].
Historically, conventional myomectomy through laparotomy had been the preferred choice for symptomatic patients who wished to preserve their uterus for future pregnancy. In 1995, conventional myomectomy represented almost 95% of all myomectomy cases. By 2014, it represented only about 10% of uterine conservative procedures. Over the past years, there has been a significant shaft towards minimally invasive techniques, thus a significant rise in performing laparoscopic myomectomy was noted from less than 1% in a995 to about 31% in 2014[(5)].
In recent years, laparoscopic myomectomy has surpassed conventional myomectomy and becomes the procedure of choice for many surgeons and medical institutes worldwide. Compared with conventional myomectomy, laparoscopic myomectomy has many advantages including: lower morbidity, lower postoperative pain scores and shorter hospital stay[(6)].
In this study, we compared effectiveness and safety of the two approaches.

MATERIAL AND METHODS

The study is a prospective comparative study which involved 120 patients who underwent either laparoscopic or conventional myomectomy at Minia University hospital from August 2021 to July 2023. Patients underwent laparoscopic myomectomy were enrolled in group 1 (n=60), where those who underwent conventional myomectomy were placed in group 2 (n=60). The study documented several case data including age, body mass index, parity, surgical history, medical history, indications of myomectomy, number, size, site of myomas.Comparison was made between expected blood loss, duration of operation, visual analog scale (VAS) and duration of hospital stay. Hemoglobin levels were detected before operation and 24 hours after the

operation. Number, size and site of myomas were detected by imaging techniques prior to surgery. The anticipated amount of blood loss was calculated by subtracting the hemoglobin levels before and after the operation. The operative duration is the time between performing the initial umbilical incision and removal of the major trocar. The duration of hospital stay was calculated depending on the interval between the day of surgery and day of discharge. Antibiotics were given to all patients in the form of 1 gm cefazolin intravenously at time of induction of anaesthesia and six hours postoperative. Treatment was given daily till discharge of the patient. Foley catheter was removed 12 hours after the operation. All operations were performed by the same surgical team.

Inclusion criteria:

- Age: 20 - 40 years
- BMI: 18.5 - 29.9 (average weight or overweight).
- Number of myomas: 2 - 4 myomas.
- Size of myomas: 2 - 6 cm.
- Site of myomas: Intramural.

Exclusion criteria:

- Associated pathology such as adenomyosis (Diffuse or localized).
- Number: Solarity or more than 4 myomas.
- Size: If less than 2 cm or more than 6 cm.
- Liability to complications of general anaesthesia.
- Pregnancy.
- Bleeding tendency disorders.
- Recurrent myomas.

Surgical technique:
The same surgical team performed all surgeries under general anaesthesia where patients were positioned in the dorsal lithotomy position. An orogastric tube was inserted into stomach of each patient and a Foley catheter was inserted to their bladders.

Conventional myomectomy:
Injection of diluted adrenaline or vasopressin was done first. Uterus was incised using monopolar cautery till reaching the capsule of the myoma. The myomawas enucleated with a tenaculum then the uterus was examined to detect other myomas. Myoma bed was closed via 1-0 vicryl or 1-0 polydioxanone interrupted or running sutures without leaving gaps. If the uterine cavity was opened during enucleation, closure was done by 3-0 vicryl sutures.

Laparoscopic myomectomy:
A 5 mm vertical incision was done, then the umbilicus was raised by Laundry clamps. A Veress needle was then inserted to establish a pneumoperitoneum (14 mmHg pressure) prior to inserting a 10 mm trocar. In patients whom suspected to have peri-umbilical adhesions, the main trocar was inserted in the Palmer's point. Ancillary 5 mm trocars were inserted about 3 cm medial to the right and left anterior superior iliac spines. An additional 5 mm trocar was inserted in the midline of the suprapubic area, about 6 cm above the symphysis pubis. The following instruments were included in the procedure: Atrumatic graspers, monopolar hooks, Semm needle holders, morcellator and suture forceps.Injection of diluted adrenaline or vasopressin around the myoma was done first. Uterine incisions were done via monopolar cautery till reaching the myoma capsule. The myoma was then enucleated by a tenaculum then it was cut and removed by morcellator. The uterus was then examined for additional myomas. Myoma bed was closed via 1-0 vicryl or 1-0 polydioxanone interrupted or running sutures without leaving gaps. If the uterine cavity was opened uring enucleation, closure was done by 3-0 vicryl.

Informed consent:
Each patient gave her signed, informed consent prior to surgery.

Ethics approval:
This study was approved by the ethics committee of the Minia University hospital of obstetrics and gynecology.

Statistical analysis:
We collected data manually and inserted to a computer to beanalyzed by SPSS software version 22.
Quantitative data were presented as (Mean ±SD).

Qualitative data were presented as event and percentage. Inferential statistics was done by independent t test and chi-square test for quantitative and qualitative data respectively. Mann Whiteny test was used for not normally distributed quantitative data. Level of

Significance wasmeasured according to P value:

- If P value was > 0.05, it was considered not significant.
- If P value was < 0.05, it was considered significant.

		Laparoscopy (N=60)		Laparotomy (N=60)		
		Mean\Median\N	**SD\IQR\%**	**Mean\Median N**	**SD\IQR\%**	**P value**
age(years)		30.6 (21-39)	4.8	30.2(21-39)	4.8	**0.690**
BMI(kg/ m2)	**Average**	45	75%	43	71.7%	**0.680**
	Overweight	15	25%	17	21.3%	
parity		2	0-2	1	0-2	**0.219**
Mode of delivery	**None**	21	33.9%	24	40.0%	**0.202**
	Normal	27	45.0%	18	30.0%	
	Prev. CS	12	20.3%	18	30.0%	
complaint	**bleeding**	27	45%	19	31.7%	**0.114**
	infertility	18	30.0%	31	51.7%	
	pain	10	16.7%	6	10.0%	
	recurrent abortion	5	8.3%	4	6.7%	
No. of myomas		2.3 (2-4)	0.5	2.4 (2-4)	0.6	**0.094**
site of myomas	**ant. + fundal**	2	3.3%	4	6.7%	**0.018***
	ant. + post.	13	21.7%	9	15.0%	
	ant. + post. + fundal	2	3.3%	13	21.7%	
	anterior wall	11	18.3%	7	11.7%	
	fundal	16	26.7%	12	20.0%	
	post. + fundal	2	3.3%	7	11.7%	
	posterior wall	14	23.3%	8	13.3%	

RESULTS

Our unit performed a total of 120 myomectomy surgeries from August 2021 to July 2023. 60 patients (50%) underwent laparoscopic myomectomy, while the other 60 patients (50%) underwent open myomectomy. Table 1 shows items like age, parity and myomas number and location. The two groups show similarities regarding age, parity, mode of previous deliveries, number and site of myomas. A significantly higher number of laparoscopic procedures were performed in patients where myomas were located in anterior uterine wall or posterior uterine wall or fundus or both anterior and posterior uterine walls (p=0.018). Conventional myomectomy was preferred when myomas were located in both fundus and anterior or posterior uterine walls and cases where myomas were distributed in fundus, anterior and posterior uterine walls (p=0.018). Surgery results are shown in table 2. There was less hemoglobin loss in the laparoscopic myomectomy group 0.8±0.2 and 1.2±0.2 gm/dl, (p<0.001) compared to conventional myomectomy group. Number of patients who required blood transfusion was significantly different between laparoscopic myomectomy group (no patients) and the conventional myomectomy group (8 patients), with a p-value of 0.014. There was a significant difference in the mean of VAS scores between laparoscopic myomectomy and conventional myomectomy 24 hours postoperative. It was 4.05±0.79and 5.92±0.81 respectively. Also, according to number of analgesic ampules needed postoperative were lower in the laparoscopic group than the open group, thus the mean was 1.83±0.69 and 3.35±0.66 respectively with a statically significant difference (p<0.001).There was a significant difference between the laparoscopic myomectomy and conventional myomectomy regarding the mean duration of hospital stay being 1.08±0.27 and 2.2±0.4 days respectively, with shorter hospital stay in laparoscopic myomectomy group (p<0.001).The average operative duration was significantly longer in laparoscopic myomectomy group

compared to conventional myomectomy group 81.6±10.6 and 47.4±9 min. respectively; (p<0.001). There was only one laparoscopic case converted to laparotomy and mostly this was due to proper selection of cases.

		Laparoscopy (N=60)		Laparotomy (N=60)		
		Mean\ N	**SD \%**	**Mean\N**	**SD \%**	**P value**
duration/min		81.5	62-100	47.3	30-65	**<0.001***
Hb (pre) gm/dl		11.8	1.1	11.8	1.1	**0.947**
Hb (post) gm/dl		11	1.1	10.6	1.1	**0.069**
Hb (loss) gm/dl		0.8	0.2	1.2	0.2	**<0.001***
units of blood transfusion	**No**	60	100%	52	86.7%	**0.014***
	One	0%	0%	7	11.7%	
	Two	0%	0%	1	1.7%	
hospital stay/day		1.08	0.27	2.2	0.4	**<0.001***
postoperative pain / VAS		4.05	0.79	5.92	0.81	**<0.001***
analgesia ampules needed		1.83	0.69	3.35	0.66	**<0.001***
Conversion to laparotomy		1	1.7%	0	0%	**0.315**

DISCUSSION

The study compared the outcomes of conventional myomectomy and laparoscopic myomectomy approaches. The laparoscopic myomectomy approach resulted in less blood loss and less blood transfusion. There was also a significant disparity in laparoscopic myomectomy regarding postoperative pain scores based on VAS. Furthermore there was also shorter duration of hospitalization in the laparoscopic myomectomy group. However, the laparoscopic myomectomy technique is associated with longer operative duration, but the duration could be shortened with increased experience and when performed by skilled well-trained surgeons[(7)].

A 2021 meta-analysis and prospective randomized trial compared conventional myomectomy and laparoscopic myomectomy. These studies found that although operative time was longer for laparoscopic myomectomy approach, there was less blood loss compared to conventional myomectomy.(maktoob fil kashkol)[(8)]

Laparoscopic myomectomy became more feasible and easier due to development of laparoscopy instruments and improvement in surgical materials. Many studies have found that laparoscopic myomectomy has lower morbidity than conventional approach[(9)].

There is a faster recovery after laparoscopic approach when compared to conventional myomectomy owing to maintenance of macrophage activity at a high level and also due to reduced inflammatory cytokines[(10)].

There was less discomfort and less postoperative pain scores in women who underwent laparoscopic myomectomy than those who underwent conventional myomectomy. The study recognized that the Visual Analog Scale (VAS) scores were significantly lowered in the laparoscopic myomectomy group 24 hours after the operation[(11)].

Laparoscopic myomectomy may face different technical challenges regarding size, site and number of myomas.[(12)]

It is decided that conventional myomectomy is preferred to laparoscopic approach when number of myomas is four or more or when myomas are larger than 10 cm[(13)].

The patient's safety in laparoscopic myomectomy depends on many factors including case selection, equipment reliability and surgeon's skills and experience. Recent studies have demonstrated that certain training and exercise can improve experts' skills than the traditional apprentice- student method[(14)].

CONCLUSION

Laparoscopic myomectomy was associated with less blood loss, lower postoperative pain scores and shorter hospital stay in selected cases when compared to conventional myomectomy.

REFERENCES

1. Statnykh, N. V., Padrul, M. M., Olina, A. A., Sadykova, G. K., Chugaeva, T. N., &Shirinkina, E. V. (2021). Uterine Myoma Guidelines.
2. Vilos, G. A., Allaire, C., Laberge, P. Y., Leyland, N., Vilos, A. G., Murji, A., & Chen, I. (2015). The management of uterine leiomyomas. Journal of Obstetrics and Gynaecology Canada, 37(2), 157-178.
3. Ahmad, A., Kumar, M., Bhoi, N. R., Badruddeen, Akhtar, J., Khan, M. I., ... & Ahmad, M. (2023). Diagnosis and management of uterine fibroids: current trends and future strategies. Journal of basic and clinical physiology and pharmacology, 34(3), 291-310.

4. Donnez, J., & Dolmans, M. M. (2016). Uterine fibroid management: from the present to the future. Human reproduction update, 22(6), 665-686.
5. Rossi, M., Solfrini, S., Tarsitano, F., Rosati, F., Facchini, C., &Antonazzo, P. (2022). Risk of minimal access surgery in uterine leiomyosarcomas: a narrative review. Gynecology and Pelvic Medicine, 5.
6. Paredes, J. S., Lee, C. L., & Chua, P. T. (2024). Myomectomy: Choosing the Surgical Approach–A Systematic Review. Gynecology and Minimally Invasive Therapy, 13(3), 146-153.
7. Wu, P. C., Sheu, B. C., Huang, K. J., Huang, S. C., & Chang, W. C. (2022). Laparoendoscopic two-site myomectomy (LETS-M) using conventional laparoscopic instruments and the glove-port technique. Journal of the Formosan Medical Association, 121(11), 2248-2256.
8. Sheng, Y., Hong, Z., Wang, J., Mao, B., Wu, Z., Gou, Y., ... & Liu, Q. (2023). Efficacy and safety of robot-assisted laparoscopic myomectomy versus laparoscopic myomectomy: a systematic evaluation and meta-analysis. World Journal of Surgical Oncology, 21(1), 230.
9. Kan, X., Shen, X., Feng, L., Hu, Y., Yu, J., & Yang, X. (2021). Comparison of safety and efficacy between laparoscopic myomectomy and traditional laparotomy for patients with uterine fibroids and their effect on pregnancy rate after surgery. Experimental and Therapeutic Medicine, 22(3), 1-7.
10. 10.Jia, M., Wang, J., Lin, C., Zhang, Q., Xue, Y., Huang, X., ... & Xu, Y. (2024). Hydrogel Strategies for Female Reproduction Dysfunction. ACS nano, 18(44), 30132-30152.
11. Wu, Y. C., Hong, M. K., & Ding, D. C. (2024). Comparison of postoperative pain in robotic and laparoscopic myomectomy: a retrospective cohort study. Journal of Robotic Surgery, 18(1), 345.
12. Paredes, J. S., Lee, C. L., & Chua, P. T. (2024). Myomectomy: Choosing the Surgical Approach–A Systematic Review. Gynecology and Minimally Invasive Therapy, 13(3), 146-153.
13. Paredes, J. S., Lee, C. L., & Chua, P. T. (2024). Myomectomy: Choosing the Surgical Approach–A Systematic Review. Gynecology and Minimally Invasive Therapy, 13(3), 146-153.
14. Campo, R., Wattiez, A., Tanos, V., Di SpiezioSardo, A., Grimbizis, G., Wallwiener, D., ... & De Wilde, R. L. (2016). Gynaecological endoscopic surgical education and assessment. A diploma programme in gynaecological endoscopic surgery. Gynecological Surgery, 13, 133-137.