Postoperative evaluation of the uterus after hysteroscopic versus Laparoscopic myomectomy of type 1 and type 2 submucous myomas

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Research Article

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Abstract

Background

Myomectomy of submucous fibroids is usually performed using hysteroscopic approach. The reproductive performance of women after removal of submucous myomas is much better in type 0 more than type 1 and 2. This conflict result might be due to harmful effect of hysteroscopy on the endometrium and inadequate healing. The objective of the cohort study was to evaluate the uterus after myomectomy using 2 surgical approaches. Both hysteroscopic and laparoscopic myomectomy were used.

Methods: A total of 74 patients with submucous fibroids were recruited and were randomly divided equally into 2 groups. Group (1) included those in whom laparoscopic myomectomy was done while in group (2) the hysteroscopic myomectomy was used. The hysteroscopic myomectomy was done using the standard techniques using the resectoscope with wire loop. The laparoscopic method was also done using the standard techniques.

Results: The duration of surgery was longer in group one and significant decrease in hemoglobin level in group one. Postoperative hysteroscopic evaluation of the uterus showed better endometrial thickness, interface and normal myometrium denoting normal uterine cavity in group (one) when compared with group (two). The complication rate was comparable in both groups.

Conclusion: Surgical treatment of type 1 and 2 submucous fibroid is feasible by both hysteroscopic and laparoscopic approaches. The laparoscopic approach had better postoperative endometrium and myometrium, fewer days of postoperative uterine bleeding and better functioning endometrium.

Introduction

Submucous myoma (SM) is one of the commonest indications of myomectomy in clinical practice. It can result in many symptoms and complications including pain, bleeding and infertility. [1]Types of SM myoma include type zero; one and two. [2]

Excision of the submucous myoma could be performed by hysteroscopic or laparoscopic approaches. The choice is usually guided by type of the submucous myoma and its size. Type zero SM myoma is usually removed by hysteroscopic approach while in type1,2 SM myomas hysteroscopic approach might not be the best option.[3]

Use of hysteroscopy for management is easy, minimally invasive and successful but might be associated with bleeding, fluid overload and incomplete removal. [4, 5]Moreover, reproductive function of the uterus after hysteroscopic myomectomy (HM) is questionable. [6, 7]

Aim of the work

The objective of the cohort study was to evaluate the uterus after management of submucous fibroid type one and type two using two different surgical approaches. In this study either laparoscopic (group one) or hysteroscopic (group two) myomectomy was used as surgical management for submucous myomas type I and II.

Setting: Endoscopy unit, El-Shatby Maternity University Hospital, Alexandria, Egypt, and Agial Specialized Endoscopy center, Roushdy, Alexandria.

Materials And Methods

Ethical approval

This study was approved by the Institutional Ethics Committee of Alexandria Maternity University hospital and written informed consent was obtained from all participants.

Patients with type II submucous myoma who were treated at Alexandria Maternity University hospital and Agial Specialized Center from October 2016 to December 2019 were assigned to complete history taking, clinical examination, and imaging study.

Transvaginal ultrasound was done and verification of the type of the submucous myoma using 3D transvaginal ultrasound and/or saline sonohysterography was done. Routine lab investigations were done for all cases included complete blood count, urine analysis, prothrombin activity, hepatitis viral markers, liver enzymes, and renal function. The patient allocation in either groups was done using an online randomizer (random.org) to select either laparoscopy or hysteroscopy approach. The inclusion criteria include any case with single submucous myoma type I or type II of any size although our maximum diameter of myoma in our study group did not exceed 6 cms in diameter. The distance between the edge of the myoma and the serosal surface (myometrium above the myoma) was >5mm. Informed consent was taken from every patient before recruitment and all cases of hysteroscopy group were counselled about the possible need for more than one session of hysteroscopy to complete the myomectomy. All our patients wished to maintain their fertility and therefore preservation of the uterus was decided. The exclusion criteria included severe heart, liver, or kidney dysfunction; multiple myomas; a cervical neoplasm, broad ligament myoma, severe uncorrected anemia less than 9 gm/dl.

Laparoscopy group: Laparoscopic myomectomy (LM) was done in the group (1). After inducing general anesthesia, a conventional puncture was performed to induce pneumoperitoneum with a carbon dioxide pressure of 12 to 14 mmHg. Four ports were established in the abdomen for placement of the surgical equipment. Injection of 10 ml of diluted epinephrine hydrochloride containing 20 mcg was done

in the capsule of the myoma. The capsule over the tumor was incised using monopolar hook, traction and countertraction was done using grasping forceps to separate the tumor from its bed. We used selective cauterization of the bleeding vessels in the myometrium or bed of the myoma. Figure [1]

The endometrium and muscle layer were then sutured using one or two layered separate intracorporeal sutures using vicryl 1/0 whenever indicated to confirm strict hemostasis and to ensure sound healing. Finally, all ports were sutured using subcuticular sutures.

Hysteroscopy group (2): Hysteroscopic myomectomy (HM) was done as follows: Under general anesthesia, the patient was placed in lithotomy position for exploration of the uterine cavity after dilatation of the cervical canal. The resectoscope was placed in the uterine cavity to observe the relationship among the position and size of the myoma and intima of the uterine cavity. A loop monopolar electrode was used to remove the myoma into ships and removed from the uterine cavity Figures [2, 3]. During this procedure, inflation and deflation of the uterus using the distension media (Glycine 1.5% solution) was done to encourage the remaining part of the myoma to bulge into the uterine cavity and remove it also in the same manner. The procedure was interrupted only if the deficit of glycine reached 1200ml. The patient was assigned for another session to remove the rest of the submucous myoma after 1-2 months. Intrauterine device was inserted in 12 cases out of 37 (32.4%) as the endometrium showed signs suggesting endometritis and the raw area was large to prevent intrauterine adhesions.

The postoperative observation of the hematocrit was ordered twice 6 hours postoperative and the second test was 6 days after the procedure to assess the blood loss during the surgery and early postoperative period. A follow up transvaginal ultrasound was done after 3 months to assess the endometrial thickness during late follicular phase and the thickness of the myometrium in the site of previous myoma. [8]

Results

Total, 74 patients with type I and II submucous myoma were included in this study. Type I submucous myoma were 42 cases of the study group (56.8%) and type II submucous myoma were 32 cases of the study group (43.2%).

Comparison between both groups as regards demographic data, number of myomas, volume of myomas and type of myomas. The number of sessions, duration of surgery, percent decrease in hematocrit level as well as delayed follow up included endometrial thickness. Both groups were matched in age, parity, BMI and mean diameter of myoma Table (1)

Comparison of the differences in the general data between the two groups showed no statistical significance (Table 1).

Group Statistics					
	Type of surgical approach	N	Mean	Std. Deviation	Std. Error Mean
age	laparoscopy	37	28.68	5.593	.919
	hysteroscopy	37	31.95	5.233	.860
parity	laparoscopy	37	.46	.767	.126
	hysteroscopy	37	.92	1.010	.166
BMI	laparoscopy	37	26.65	4.178	.687
	hysteroscopy	37	26.84	4.213	.693
Submuous myoma type	laparoscopy	37	1.4324	.50225	.08257
	hysteroscopy	37	1.4324	.50225	.08257
Mean myoma diameter (mm)	laparoscopy	37	38.22	6.033	.992
	hysteroscopy	37	38.95	5.735	.943
Hematocrit change after 6 hours	laparoscopy	37	5.08	.829	.136
	hysteroscopy	37	4.59	1.117	.184
Hematocrit change after 1 week	laparoscopy	37	1.0027	.51773	.08511
	hysteroscopy	37	1.9297	.73328	.12055
Duration (minutes)	laparoscopy	37	75.59	14.359	2.361
	hysteroscopy	37	36.92	4.693	.771
Number of sessions	laparoscopy	37	1.0000	.00000	.00000
	hysteroscopy	37	1.4324	.50225	.08257
Endometrium (mm)	laparoscopy	37	11.03	1.922	.316
	hysteroscopy	37	8.08	1.090	.179
Complications	laparoscopy	37	4.3243	1.27048	.20887
	hysteroscopy	37	5.0541	.46821	.07697

Table 1) General data between the two groups showed no statistical significance

The operative duration was shorter in the group two than group one ($P < 0.05$) although the second group needed more sessions to complete the hysteroscopic myomectomy.

The six hours postoperative hematocrit level was less in the first group denoting significantly more blood loss in the first group ($P < 0.05$). The hematocrit that was done one week after the surgery was significantly less in the second group than first group denoting significantly more blood loss in the second group in the early postoperative period ($P < 0.05$). The endometrium measured in the first group had significant more thickness than in the second group. Table (2)

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	Laparoscopy group	Hysteroscopy group	t	df	Sig. (2-tailed)
Duration (min)	75.5±14.3	36.9±4.6	15.573	43.603	.000
Hematocrit change after 6 hours	5.1±0.28	4.5±1.1	2.127	72	.037
Hematocrit change after 1 week	1±0.51	1.9±0.73	-6.282	72	.000
Endometrium (mm)	11±1.9	8.1±1.1	8.111	72	.000

Table (2) comparison between both groups for operative parameter

The complication took place in 9 cases out of 37 in group one (24.3 %) while in the second group complications comprised 4 cases out of 37 (10.8 %). Table (3)

Complications in the study group were 14 cases in 74 cases and there are tabulated in table (3)

complications

	Frequency	Percent	Valid Percent	Cumulative Percent
emphysema	2	2.7	2.7	2.7
sepsis	3	4.1	4.1	6.8
fever	4	5.4	5.4	12.2
OHIA	2	2.7	2.7	14.9
none	60	81.1	81.1	95.9
bleeding	2	2.7	2.7	98.6
cervical tear	1	1.4	1.4	100.0
Total	74	100.0	100.0	

Statistical methods SPSS 22.0 statistical software (IBM Corp., Armonk, NY, USA) was used for the statistical analysis. Measurement data are expressed as mean_standard deviation. An independent-samples t-test was used for intergroup comparisons, and a paired t-test was used for intragroup

comparisons. Enumeration data are presented as rates. The X2 test was employed for intergroup comparisons. A P value of <0.05 indicated that the difference was statistically significant. OHIA: hysteroscopy intravascular absorption (OHIA) syndrome

Discussion

The main target in this study was to assess the laparoscopic management of the SM type I and II in comparison to the standard hysteroscopic approach. Many pros and cons were found in each approach. [9] There is no simple answer to the question wondering which is better? Although data from this study suggested the advantage of laparoscopic approach in the women wishing to preserve fertility.

The endometrium thickness was larger in group one than in group two and this finding was expected as the laparoscopic myomectomy preserve the endometrium while in hysteroscopic myomectomy removed part of the endometrium is proportionate to the size of the myoma. [10]

The blood loss in the first group was higher intraoperative and minimal postoperative while in group two intraoperative blood loss was small but it continued for longer period postoperatively that resulted in comparable hemoglobin level in both groups after one week of the surgery. These data are in accord with other trials to evaluate the blood loss during hysteroscopic myomectomy. [11, 12]

Operative hysteroscopy still the standard surgical approach of choice and the accepted treatment for submucous myomas. Many studies reported the impact of submucous myoma and subfertility and high pregnancy wastage rate. The improvement in both indications after myomectomy is also addressed. However, the role of the myomectomy of submucous myoma and its secondary outcome remain controversial. [9, 13]

Although many studies addressed the possibility of laparoscopic myomectomy of large submucous fibroid but no clear conclusion about fertility and pregnancy outcome after hysteroscopic and laparoscopic approaches could be found. [14, 15]

Unfortunately, we were not able to do office hysteroscopy for most but not all patients postoperatively. Evaluation of the myometrium and the endometrium using transvaginal ultrasound after 2-3 months was done. This study is the first to evaluate between postoperative uterine cavity evaluation using 2 approaches of endoscopic myomectomy.

Conclusion

Both laparoscopy and hysteroscopy are effective methods to do successful myomectomy for type I and II. Use of laparoscopy has advantage of single session surgery and better endometrium for future

reproductive performance. Hysteroscopic myomectomy is less invasive, less blood loss but may indicate another session to completely remove the myoma.

Recommendation

We recommend long follow up of both groups (I and II) to validate their fertility and their reproductive performance and pregnancy rate and surgery related pregnancy complications.

Abbreviations

SM: Submucous

HM: Hysteroscopic myomectomy

LM: Laparoscopic myomectomy

BMI: Body mass index

OHIA: hysteroscopy intravascular absorption (OHIA) syndrome

Declarations

Consent for Publication: I confirm that all authors accept the manuscript for submission.

Availability of data and material: Available.

Conflicts of interest / Competing interests: nothing to be disclosed.

Consent for publication and participation: Informed consent was signed from every patient before participation in this study. **Ethical committee approval** from Alexandria University and patient's approval for publishing these data were obtained.

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Figures

Figure 1

Shows incision of the capsule and dissection of myoma.

Figure 2

loop excision of the myoma

Figure 3

final view after myomectomy