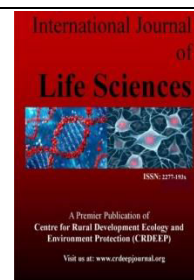


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Full Length Research Paper

Evaluation of Endometrial Cavity after Hysteroscopic Myomectomy

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ABSTRACT

Background Leiomyomas are the most common benign tumors among women and are found clinically in 25% of women. Symptomatic fibroids serve as the most common indication of hysterectomies (Chittawar et al., 2014). However, in reproductive-aged women who desire uterine conservation and fertility, myomectomy is the treatment of choice. Fibroids are estimated to be present in 5–10% of women with subfertility and may act as the primary cause of infertility in 2–3% of cases (Shaia et al., 2017). *Aim of the work:* is to evaluate the uterine cavity for occurrence of adhesions after Hysteroscopic myomectomy. *Patient and methods:* This was a prospective single center clinical study that was conducted in Obstetrics and Gynecology Department, Al-Azhar University Hospital (New Damietta) from May 2017 to May 2018. Thirty-five women were recruited for this study from outpatient clinic who attended for diagnostic hysteroscopy 2-3 months after Hysteroscopic myomectomy. A diagnostic hysteroscopy was performed to search postoperative intrauterine adhesions. *Results:* The present study included 35 women who underwent Hysteroscopic myomectomy; 2-3 months after Hysteroscopic myomectomy, 2nd look hysteroscopy was done and revealed that, 6 women (17.1%) had uterine adhesions (Synechia).

Introduction

Leiomyomas are the most common benign tumors among women and are found clinically in 25% of women. Symptomatic fibroids serve as the most common indication of hysterectomies (Chittawar et al., 2014). However, in reproductive-aged women who desire uterine conservation and fertility, myomectomy is the treatment of choice. Fibroids are estimated to be present in 5–10% of women with subfertility and may act as the primary cause of infertility in 2–3% of cases (Shaia et al., 2017).

The composition, size, location and number of fibroids may affect woman's fertility and pregnancy complications and this may be due to distortion of the endometrial cavity, which causes abnormal endometrial receptivity and hormonal milieu and altered endometrial development (Rackow and Taylor, 2010). Fibroids are classically described as submucosal fibroids (SM), intramural fibroids (IM) or subserosal fibroids (SS) according to location (Ezzati et al., 2009).

Location, size and distortion of the endometrial cavity are three factors that have been extensively reviewed with regard to fibroids and fertility. Intramural (IM) and submucosal (SM) fibroids affect fertility to varying degrees. SM fibroids correlate

negatively with both spontaneous pregnancy and assisted reproductive technology (ART) (Kroon et al., 2011). Minimally invasive myomectomy by hysteroscopy or laparoscopy, as opposed to hysterectomy, is the preferred surgical procedure for patients who wish to preserve fertility. The advantages of the laparoscopic approach against laparotomy are well established. Although the efficacy of myomectomy per se on restoring fertility has never been proven by a randomized clinical trial (Segars et al., 2014).

Aim of the work

The aim of this study is to evaluate the uterine cavity for occurrence of adhesions after Hysteroscopic myomectomy.

Patients and methods

This was a prospective single center clinical study that was conducted in Obstetrics and Gynecology Department, Al-Azhar University Hospital (New Damietta) from May 2017 to May 2018. Thirty-five women were recruited for this study from outpatient clinic who attended for diagnostic hysteroscopy 2-3 months after Hysteroscopic myomectomy. A diagnostic hysteroscopy was performed to search postoperative intrauterine adhesions.

Inclusion criteria:

- Women who had Hysteroscopic myomectomy from 2-3 months.
- Choice of the patient according to demographic data.
- Women included in the study should be in their postmenstrual phase.

Exclusion criteria:

- Pregnancy proven or suspected.
- Presence of any other uterine anomaly.
- History of previous uterine surgery other than myomectomy.
- The presence of intrauterine adhesions prior to myomectomy.
- IUCD should be excluded.
- Any uterine cavity manipulation after Hysteroscopic myomectomy as D&C, Hystersalpingogram.... etc.

- Careful Historytaking to check for inclusion and exclusion criteria according to standardized research protocol.
- Menstrual History was taken to ask about any menstrual irregularities, post menstrual spotting, dysmenorrhea.
- Obstetric history was taken carefully especially a history of previous cesarean delivery, number of cesarean deliveries, its indication and any operative and post-operative complication.
- Past history including medical diseases (DM, Hypertension, Coagulopathies, cardiac and pulmonary diseases....), previous operations, previous preterm labor, previous dilatation and curettage, previous abortion or others.
- Report of previous Hysteroscopic myomectomy as regard to nature of Hysteroscopic surgery and any complications.
- Report of previous ultrasound as regard to type, size of myoma, grading of myoma according to Fig classification of submucousmyoma (2011):

For each woman asked to join the study, the nature of the procedure (diagnostic office hysteroscopy) was explained carefully, a written consent and scientific committee agreement was taken and the following was done.

Submucousmyoma	0	Pedunculated intracavitary
	1	<50% intramural
	2	>50% intramural

- Speculum visualization of vagina, cervix, and bimanual vaginal palpation for the exclusion uterine infection.

Diagnostic office hysteroscopy was performed 2-3 months after previous Hysteroscopic myomectomy. Hysteroscopy was done by using a 30° forward oblique telescope without anesthesia in the early proliferative phase, light was provided by a light source, the patient was asked to empty her bladder and the patient was positioned in lithotomy position. The thighs should be at a 90° angle to the pelvis in order to create enough space to manipulate the hysteroscopy. Cleaning the vulva and vagina by antiseptic solution was performed. The patient perineum should be just past the edge of the table. Normal saline was used for uterine distention connected to the inflow channel on the sheath with intravenous tubing. A vaginal wash with saline solution was performed without placing speculum. Before the hysteroscopy and sheath insertion into the external Os, the sheath was flushed to remove the air and the tip of the hysteroscope was positioned in the introitus. The labia being slightly separated with fingers

the vagina was distended with saline and the scope was driven to the posterior fornix to readily visualize the portio and slowly backwards to identify the external cervical Os. When this become visible, scope was carefully moved forward to the internal Os and then the uterine cavity with least possible trauma. The uterine cavity was systemically explored by rotating the fore-oblique scope in order to discover any abnormalities in the uterus and/or the right and left tubal ostia. At this stage, it is crucial to avoid lateral movement to reduce patient discomfort. After that, the scope was removed; the patient was kept in the supine position for a few minutes to avoid vaso-vagal attack. The duration of the procedure and fluid defect was calculated in each procedure .Any complications were documented .Findings of hysteroscopy especially presence of any adhesions were noted and graded as mild, moderate, and severe based on extend and type of adhesions found on hysteroscopy and according to following:

Table (1). Findings of hysteroscopy

Classification	Condition
Mild	Filmy adhesion occupying < 1 quarter of uterine cavity. ostial areas and upper fundus minimally involved or clear.
Moderate	One forth to three fourths of cavity involved. ostial areas and upper fundus partially involved. No agglutination of uterine walls.
Severe	More than three fourths of cavity involved. ostial areas and upper fundus partially occluded. Agglutination of uterine walls.

(Yu et al., 2008).

The occurrence rate and severity of intrauterine adhesions and its relationship with type, size, and number of submucousmyoma (grade 0,1,2) and the condition of endometrium such as endometritis, distortion of uterine cavity were investigated.

Statistical analysis of data

The collected data were organized, tabulated and statistically analyzed using statistical package for social sciences (SPSS) version 21 (SPSS Inc, Chicago, USA), running on IBM compatible computer. For qualitative data, frequency and percent distributions were calculated. For quantitative data, mean,

standard deviation (SD), minimum and maximum were calculated. For all tests p value <0.05 were considered significant.

Results

Table (2): Demographic data of the studied cases:

Parameters	Studied cases (35)
Age (Mean ± SD)	26.67 ± 4.82
BMI (Mean ± SD)	27.03 ± 3.71
Parity	31.43 % (11 Cases)
Abortion	28.57 % (10 Cases)
Infertility	40 % (14 cases)

The mean age and BMI in the present study was 26,67 ± 4.82 and 27.03 ± 3.71 respectively. There was 28.57% had abortion and 40 % of cases were infertile.

Table (3): History of Menstrual disorders of the studies cases before hysteroscopic myomectomy:

Disorders	Studied cases (35)
No Menstrual Disorders	57.14% (20 cases)
Menstrual Irregularity	28.57% (10 cases)
Post menstrual spotting	2.85 % (1 Cases)
Dysmenorrhea	11,42 % (4 Cases)

In the present study, there were 57.14% of cases presented with regular menstrual cycle, 28.57% with menstrual irregularity, 2.85% with post menstrual spotting and 11.42% with dysmenorrhea.

Table (4): Medical history of the studied cases:

Parameters	Studied cases (35)
No medical history	27 (77.1%)
Diabetes mellitus (DM)	3 (8.6%)
Hypertension (HTN)	1 (2.9%)
DM & HTN	2 (5.7%)
Other disorders	2 (5.7%)

In the present study, there were 8.6% of cases with history of DM, 2.9% with HTN, 5.7% with combined disorder and 5.7% with history of other disorder (thyroid disease and asthma).

Table (5): Characteristics of myoma as regard to size, site, grade and number before hysteroscopic myomectomy :

Site	Fundal	Anterior	Posterior	Lateral
	12(34.3%)	11(31.4%)	9(25.7%)	3(8.6%)
Grade	Grade 0	Grade 1	Grade 2	
	15(42.85 %)	12(34.28)	8(22.85 %)	
Size	Ranging from 1 to 3 cm			
Number	Only one submucous myoma			

Table (6): Incidence of post-hysteroscopic myomectomy adhesions in studied women:

	Number	Percentage (%)
With adhesion	6	17.1
No adhesion	29	82.9
Total	35	100.0

The present study included 35 women who underwent Hysteroscopic myomectomy; 2-3 months after Hysteroscopic myomectomy, 2nd look hysteroscopy was done and revealed that, 6 women (17.1%) had uterine adhesions (Synechiae).

Table (7): Correlation between intrauterine adhesions and clinical presentation of studied females before Hysteroscopic myomectomy:

Complaint		With Synechiae		No Synechiae		Total	
		N	%	N	%	N	%
Infertility		2	33.33 %	12	41.38 %	14	40 %
	AUB	3	50 %	8	27.59 %	11	31.43%
	RPL	1	16.67 %	9	31.03 %	10	28.57 %

AUB: abnormal uterine bleeding; RPL: recurrent pregnancy loss.

As regard to main clinical presentation (indication for myomectomy), it was infertility in 40% of studied females,

abnormal uterine bleeding (AUB) in 31.43%, and recurrent pregnancy loss in 28.57%.

Table (8): Correlation between intrauterine adhesions and myoma grade:

		With Synechiae		No Synechiae		Total	
		N	%	N	%	N	%
Myoma Grade	Grade 0	1	16.67%	14	48.28 %	15	42.85 %
	Grade 1	2	33.33 %	10	34.49 %	12	34.28 %
	Grade 2	3	50 %	5	17.24 %	8	22.85 %

Regarding myoma grade in studied populations, 42.85% were grade 0, 34.28% were grade 1 and 22.85% were grade 2; and there no difference between both groups (the grades were 0, 1

and 2 in 16.67%, 33.33% and 50% respectively in group with adhesion, compared to 48.28%, 34.49% and 17.24% in group without adhesion respectively).

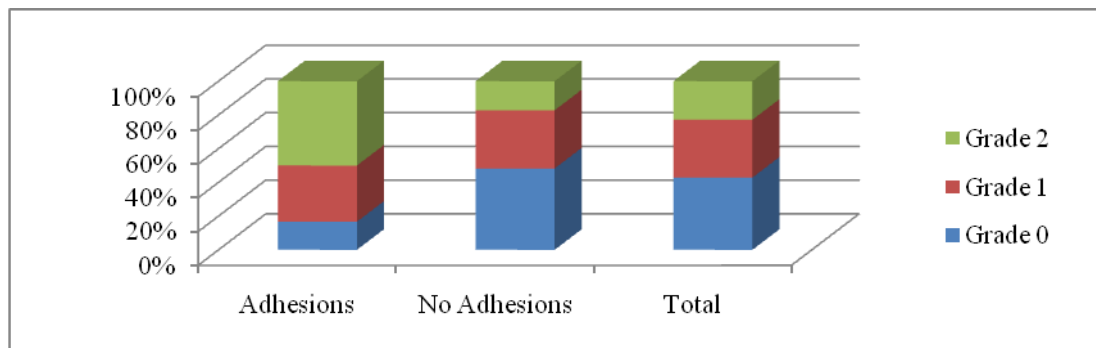


Fig 1: Myoma grade in studied females.

As regard complications of the procedure there were no complications reported such as uterine perforation, infection, and volume overload or air embolism.

Table (9): Correlation between intrauterine adhesions and myoma site:

Position		With Synechiae		No Synechiae		Total	
		N	%	N	%	N	%
Anterior	Anterior	1	16.7 %	10	34.5 %	11	31.4 %
	Posterior	4	66.6 %	5	17.3 %	9	25.7 %
	Fundal	1	16.7%	11	37.9 %	12	34.3 %
	Lateral	0	0%	3	10.3 %	3	8.6 %

As regard position of uterine myoma, it was anterior in 31.4%, posterior in 25.7%, fundal in 34.3%, lateral in 8.6%; and there was statistically significant increase of post-myomectomy

adhesions in posterior position (66.6% of cases presented with synechiae were posterior compared to 17.3% in females without synechiae).

Table (10): Grade of adhesion in studied females:

Adhesion Grade	Mild	Moderate	Total	
			N	%
			4	66.67 %
			2	33.33 %
			6	100 %

Regarding the grade of adhesion, it was mild in 4 patients out of 6 females, representing 66.67%; and moderate in 33.3% and no severe adhesion was reported.

Table (11): Characteristics of patient with intrauterine adhesions:

Case	Age		infertility	Abortion	Grade of submucous fibroid			Site				
	18-26	27-35			0	1	2	Fundal	Ant.	Post.	Lat.	
1	√					√				√		
2	√				√				√			

3		√	√			√		√
4		√		√		√		√
5	√				√		√	
6		√	√			√		√

Discussion

The mean age and BMI in the present study was 26.67 ± 4.82 and 27.03 ± 3.71 respectively. These results similar to Singh et al. (2016) who reported that Leiomyomas are the commonest benign pelvic tumors in women and occur in 20-30% of women in the reproductive age group. In this study infertility, represent 40% of the studied female.

Kim and Sefton (2012) and Khan et al. (2014) noticed that the risk of developing fibroids occurred when the menarche occurred at an early age. Islam et al. (2013) reported that obesity play an important role in the development of fibroid. As regard to myoma site, in this study all submucous fibroids were corporeal, they maybe fundal in 34.3%, lateral in 8.6%, anterior in 31.4% and posterior in 25.7%.

Most submucous fibroids occur at the corporeal sites of the uterine cavity (Medikare et al., 2011). Some are fundal, others are anteriorly, posteriorly or laterally situated. Small fibroids may also arise from the cornual regions, thus interfering with the utero-tubal junction lumen. A few are located at the cervical canal (Valle and Buggish, 2007). As regard to myoma size, there is relation between size of fibroid, degree of myometrial invasion and incidence of post-operative adhesion. Asgari et al. (2015) reported that there is a significant association between the size of fibroid and incidence of postoperative intrauterine adhesions. The size of fibroid may be related to the degree of myometrial defect and consequent scar formation.

Conforti et al. (2014) not found a significant association between size and number of fibroid with adhesion formation. Asgari et al. (2015) found a positive correlation between number of fibroids and intrauterine adhesions in their studies. As regard to main clinical presentation (indication for myomectomy), it was infertility in 40% of studied females, abnormal uterine bleeding (AUB) in 31.43%, pelvic pain in 0%, and recurrent pregnancy loss in 28.57% and there was significant difference between both groups.

The effects of hysteroscopic myomectomy on the reproductive outcome in infertile women have been investigated by Somigliana et al. (2007), but unfortunately the evidence thus far is not of the highest quality. Reported post-surgical pregnancy rate varies from 16.7 to 76.9 percentage with a mean of 45%. This large variation may be mainly related to difficulty in controlling for multiple infertility factors, to sample size and follow-up discrepancies and to differences in patients' (i.e. age, primary or secondary infertility) and fibroid characteristics (i.e. number, size, intramural portion and presence of concomitant intramural fibroids) (Cheong and Ledger, 2007; Somigliana et al., 2007).

Bosteels et al. (2013) found an increased pregnancy rates after the hysteroscopic polypectomy, removal of submucous fibroids, uterine septum or intrauterine adhesions, which can be found in 10% to 15% of women seeking fertility. In a prospective study by Taskin et al. (2000) a second-look diagnostic hysteroscopy

showed mild intrauterine adhesions in the 37.5% of patients after monopolar resection of a single fibroid and in the 45% after resection of multiple fibroids. Gambadauro et al. (2012) noticed that the rate of intrauterine adhesions is variable from 1.07% to 78% depending on the use of electrocautry and adhesion preventive strategies. Gupta et al. (2013) found a 30% incidence of intrauterine adhesions in cases of abdominal myomectomy where the uterine cavity was breached. However, the cases where intrauterine adhesions were diagnosed were historical controls that had undergone myomectomy in past and wherein uterine cavity was opened.

The present study included 35 women who underwent Hysteroscopic myomectomy; 2 months after myomectomy, Second look diagnostic hysteroscopy was done and revealed that, 6 women (17.1%) had uterine adhesions (mild, representing 66.67%; moderate in 33.3% and no sever adhesion was reported . Synechiae of the uterine cavity, the most common postoperative complication after resectoscopic myomectomy (Taskin et al., 2000), are related to the healing that follows the removal of myomas or possibly to perforation of the uterine wall. Despite the frequency of the latter episode, there are few examples available in literature that describes its prevalence: (Shokeir et al., 2008; Touboul et al., 2009).

Mazzon et al. (2014) reported that, in 29 patients (4.23%), synechiae of the uterine cavity after resectoscope surgery was found. This value is much lower than the present work, and it may be attributed to different inclusion criteria, where they included all myomas regardless of its size and included all females regardless of their age group.

Taskin et al. (2000), in a prospective randomized study, reported a 31.3% rate of synechiae after resectoscopic myomectomy of a single myoma, reaching a rate of 45.5% in cases of multiple myomas. In 2008, Yang et al. (2008) reported a rate of 1.5% after resection of a single myoma and 78% in cases of myomas located one in front of the other. Multiplicity of myomas was considered the most important risk factor for development of postoperative adhesion.

As regard to complications there were no complications reported in our study such as uterine perforation, infection, volume overload or air embolism. Jayakrishnan et al. (2013) done their work on 37 patients with submucosal myomas who treated by hysteroscopic resection and reported that the complication rate was 5.4% (two patients). One patient had intraoperative hemorrhage, which was controlled with intrauterine Foleys for 8 h and one pint of blood transfusion. Other patient had a uterine perforation, which was managed laparoscopically. In a series of 255 Hysteroscopic morcellation procedures reported by Arnold et al. (2016), no intraoperative complications were noted. Haber et al. (2015) also reported an overall low complication rate of <0.1% when reviewed over a 9 year period, which is nearly a ten-fold reduction in the complication rate of 0.95% reported in a meta-analysis of 2515 patients undergoing Hysteroscopic resection (Jansen et al., 2000).

Conclusion

Submucous fibroid may be a cause of abnormal uterine bleeding, infertility and recurrent pregnancy loss; Hysteroscopic myomectomy is the gold standard technique for treatment of such cases. Intrauterine adhesions after Hysteroscopic myomectomy is related to therefore, in all cases desiring fertility second look hysteroscopy is highly recommended to diagnose this adhesions early.

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