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Incidence of intrauterine synechiae by second-look hysteroscopy following hysteroscopic myomectomy

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Abstract
Background: Intrauterine adhesions (IUA), also known as Asherman's syndrome, represent a significant complication following hysteroscopic myomectomy with potential implications for reproductive outcomes. This prospective observational study aimed to determine the incidence of intrauterine synechiae using second-look hysteroscopy and evaluate the efficacy of early adhesiolysis.
Methods: A total of 50 patients undergoing hysteroscopic myomectomy for submucosal fibroids at the Department of Obstetrics and Gynaecology, Mahatma Gandhi Medical College and Hospital, Jaipur, were enrolled from January 2021 to June 2022. All patients underwent second-look hysteroscopy at 6-8 weeks post-surgery. Adhesions were graded according to the American Society for Reproductive Medicine (ASRM) classification, and adhesiolysis was performed in the same sitting when present.
Results: Of the 50 patients studied, 10% (5/50) developed intrauterine adhesions following hysteroscopic myomectomy. All identified adhesions were ASRM Stage 1 (mild grade). Three cases (6%) showed adhesions involving less than 1/3rd of the uterine cavity, while 2 cases (4%) demonstrated adhesions involving 1/3rd to 2/3rd of the cavity. All adhesions were filmy in nature with no dense adhesions observed. Following adhesiolysis, 100% of patients maintained normal menstrual patterns with no cases of hypomenorrhea or amenorrhea.
Conclusion: Early second-look hysteroscopy following hysteroscopic myomectomy is an effective diagnostic and therapeutic procedure for detecting and treating newly formed post-operative intrauterine adhesions. This approach prevents progression to severe adhesions and reduces the risk of menstrual abnormalities and reproductive complications.

Keywords: Hysteroscopic myomectomy, intrauterine adhesions, second-look hysteroscopy, asherman's syndrome, adhesiolysis

Introduction
Intrauterine adhesion (IUA) is an inflammatory reaction characterized by the adherence of opposed uterine walls to each other as a result of trauma to the basalis layer of endometrium [1]. The resulting obliteration of the uterine cavity can be partial or total, a condition known as Asherman's syndrome [1]. Intrauterine adhesions most commonly occur following traumas to the basalis layer of the endometrium, particularly after endometrial curettage, post-partum hemorrhage, abdominal or laparoscopic myomectomy, and hysteroscopic resections of myoma, polyp, or uterine septum [2]. Secondary formation may also occur following infection such as genital tuberculosis, endometritis, or schistosomiasis.
The incidence of IUA following single myoma resection is 31.3%, increasing to 45.5% in cases of multiple myoma resection [3]. The mechanism of IUA formation is multifactorial, with trauma to the basalis layer of the endometrium being the commonly identified inciting event [3].
Intrauterine adhesions can manifest with diverse clinical presentations. Patients may experience menstrual abnormalities or develop obstetric consequences including miscarriages, premature rupture of membranes (PROM), premature delivery, and abnormal placentation (placenta accreta, percreta, or increata) [4]. Furthermore, IUA represents one of the main causes of secondary infertility, with an incidence of 1.7-7% observed during hysteroscopic evaluation of infertile women [5].
Hysteroscopic myomectomy (HM) is clearly associated with IUA formation, with multiple opposing fibroids presenting a higher risk for adhesion development [7]. Multiple treatment options for submucosal myomas exist, including medical management, radiofrequency ablation,

uterine artery embolization, myomectomy, and hysterectomy. Myomectomy remains the fertility-sparing intervention of choice in patients desiring future pregnancy. The selection of myomectomy approach depends on fibroid location, number, size, and physician skill level [8]. Regardless of the surgical approach, myomectomy carries inherent reproductive risks.

Diagnostic hysteroscopy is recommended 6 weeks following hysteroscopic submucosal myomectomy to evaluate intrauterine adhesion formation and permit simultaneous adhesiolysis. Contemporary miniature hysteroscopes with operative sheaths reduced to 3.5 mm diameter enable successful navigation and complete adhesiolysis even in complicated cases of cervical stenosis and adhesions.

The purpose of the present study is to analyze the prevalence of IUA development in women undergoing hysteroscopic resection for submucosal myomas and to evaluate the efficacy of second-look hysteroscopy in diagnosing and treating post-surgical adhesions, thereby restoring uterine cavity shape and volume to normal and facilitating communication between the uterine cavity, cervical canal, and fallopian tubes.

Aims and Objectives

- To determine the incidence of intrauterine synechiae by second-look hysteroscopy following hysteroscopic myomectomy
- To treat the intrauterine adhesions during second-look hysteroscopy

Materials and Methods

Study Design and Setting

This was a prospective observational study conducted at the Department of Obstetrics and Gynaecology, Mahatma Gandhi Medical College and Hospital, Sitapura, Jaipur, Rajasthan, India, between January 2021 and June 2022.

Study Period and Sample

The study was conducted over an 18-month period. All patients admitted for hysteroscopic myomectomy during this period at the Department of Obstetrics and Gynaecology who fulfilled the inclusion criteria were enrolled in the study after informed consent.

Inclusion and Exclusion Criteria

Inclusion Criteria

All patients who had undergone hysteroscopic myomectomy at the Department of Obstetrics and Gynaecology, MGMCH

Exclusion Criteria

- History of previous intrauterine surgery other than hysteroscopic myomectomy
- Women who refused to provide consent
- Patients who underwent hysteroscopic myomectomy outside MGMCH

Ethical Considerations

The study protocol was submitted to and approved by the institutional ethical committee (IEC) of Mahatma Gandhi Medical College and Hospital, Jaipur. Subjects were informed about the objective of the study, and both verbal and written consent was obtained prior to enrollment.

Methodology

All patients underwent routine pre-operative evaluation including investigations for pre-anaesthesia fitness. Antibiotic prophylaxis (1 gram intravenous cefotaxime following sensitivity testing) was administered 30 minutes prior to the procedure.

Following appropriate written and informed consent, patients underwent second-look hysteroscopy with a 2.9 mm rigid telescope in Bittochi sheath using normal saline (0.9%) as the distension media. Intraoperative findings were documented, and the presence or absence of intrauterine adhesions was noted. Grading of post-operative intrauterine adhesions was performed using the ASRM scoring system. Adhesiolysis was conducted using 5 Fr hysteroscopic scissors in the same sitting when adhesions were identified.

Statistical Analysis

Data were coded and entered into Microsoft Excel spreadsheet. Statistical analysis was performed using SPSS version 20 (IBM SPSS Statistics Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means, and standard deviations. Data normality was assessed using the Kolmogorov-Simonov test prior to statistical analysis. The chi-square test was employed for qualitative data comparison of clinical indicators. The level of significance was set at $P \leq 0.05$.

Results

The study included 50 patients undergoing hysteroscopic myomectomy, with a mean age of 30.78 ± 3.96 years (range 22-38). Most patients (52%) were aged 30-35 years, followed by 24% in 20-25 years, 12% in 25-30 years, and 12% older than 35. [Table no. 1] Clinical presentations varied, with menorrhagia being most common (92%), followed by dysmenorrhea (26%), infertility (22%), intermenstrual bleeding (20%), and recurrent pregnancy loss (6%). [Image no. 1] Most patients (92%) were without comorbidities; the remainder had diabetes mellitus type 2 (2%), hypertension (4%), or hypothyroidism (2%).

Fibroid sizes were predominantly less than 2 cm (56%), with 30% measuring 2-3 cm and 14% at 3-4 cm (mean size 2.85 ± 0.15 cm). Regarding myoma classification, 58% had FIGO Grade 1, 24% Grade 0, and 18% Grade 2 myomas, with no Grade 3 myomas. [Table no. 2]

The mean interval between hysteroscopic myomectomy and second-look hysteroscopy was 6.72 ± 0.9 weeks. The timing of second-look hysteroscopy was mainly at 6 weeks (58%), with others at 7 weeks (12%) and 8 weeks (30%).

Intrauterine adhesions (IUAs) were detected in 10% of patients (5/50) during second-look hysteroscopy. Adhesion occurrence correlated with FIGO grade: 4% of patients with Grade 1 and 6% with Grade 2 myomas developed adhesions, while none with Grade 0 did. Adhesions involved less than one-third of the uterine cavity in 6% of patients and between one-third and two-thirds in 4%; no adhesions involved more than two-thirds. All adhesions were filmy; there were no dense adhesions observed. [Table no. 3]

All patients who underwent adhesiolysis reported normal menstrual flow during the first post-operative menstruation; none reported hypomenorrhea or amenorrhea, despite 10% having adhesiolysis. According to the ASRM classification, all adhesions were Stage 1 (mild), with scores of 3-4. A statistically significant association (P=0.001) was found between second-look hysteroscopic findings and menstrual patterns: all patients with adhesions maintained normal menstrual flow post-operatively. [Table no. 4]

Less than 1/3rd cavity involved filmy adhesion showed 2 cases in Regular menstrual flow. 1/3rd - 2/3rd cavity involved filmy adhesion seen in 2 cases in Hypomenorrhea. Comparison of

Second look Hysteroscopic Finding and Menstrual pattern after hysteroscopic myomectomy was showed statistically significant results. Non of case ,who were having intra uterine adhesions after minimum of 6 weeks of hysteroscopic myomectomy had complaints of any menstrual abnormality.

Table 1: Age-wise Distribution of Study Population

Age Group (Years)	Frequency (n)	Percentage (%)
20-25	12	24.0
25-30	6	12.0
30-35	26	52.0
>35	6	12.0
Total	50	100.0

Table 2: Type of Mayoma wise distribution of the study

	Frequency	Percent	% of patients having synechiae after hysteroscopic myomectomy
G-0	12	24.0	0
G-1	29	58.0	4
G-2	9	18.0	6
G-3	0	0	0
Total	50	100.0	10

Table 3: Second look hysteroscopic finding wise distribution of the study

	Frequency	Percent
<1/3rd of Uterine cavity involved, filmy adhesion	3	6.0
1/3rd - 2/3rd of Uterine cavity involved filmy adhesion	2	4.0
>2/3rd of Uterine cavity involved filmy adhesion	0	0
No adhesion	45	90.0
Total	50	100.0

Table 4: Comparison of Second look Hysteroscopic Finding and Menstrual pattern after hysteroscopic myomectomy

		Menstrual pattern after hysteroscopic myomectomy		Total
		Hypomenorrhea	Regular menstrual flow	
Second look Hysteroscopic Finding	<1/3rd cavity involved, filmy adhesion	**0**	**3**	**3**
	1/3rd - 2/3rd cavity involved filmy adhesion	0	2	2
	>2/3rd cavity involved filmy adhesion	0	0	0
	No adhesion	0	45	45
Total		0	50	50

P value=0.001 (S)

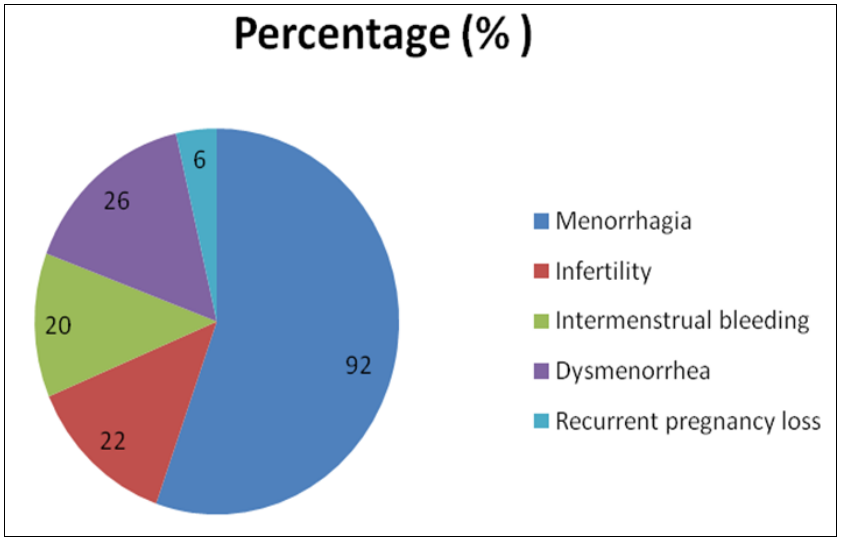

Image 1: Menstrual Complaint wise distribution of the patients who had undergone Hysteroscopic myomectomy

Discussion

Intrauterine adhesion represents an inflammatory reaction characterized by adherence of opposed uterine walls resulting from endometrial trauma. The resulting partial or total obliteration of the uterine cavity constitutes Asherman's syndrome. IUA most commonly follows trauma to the endometrial basalis layer.

In the present study, 50 patients underwent hysteroscopic myomectomy of submucosal myomas at our institution, with second-look hysteroscopy performed at minimum 6 weeks post-operatively. The study population consisted of 12 patients with FIGO type 0 myomas, 29 with FIGO type 1 myomas, and 9 with

FIGO type 2 myomas. All procedures utilized saline bipolar cautery. Among the 29 type 1 myoma cases, 2 developed grade 1 adhesions involving less than 1/3rd of the cavity with filmy characteristics. Among the 9 type 2 myoma cases, 3 developed grade 1 adhesions; in 1 case adhesions involved less than 1/3rd of the cavity, and in 2 cases adhesions involved 1/3rd to 2/3rds of the cavity, all with filmy characteristics.

The incidence of intrauterine adhesion following hysteroscopic myomectomy in our study was 10%, diagnosed by second-look hysteroscopy and treated in the same setting. This finding aligns with comparable literature. Dieme MEF and colleagues [6] reported 2 cases of synechiae among 17 patients undergoing hysteroscopic resection of submucosal myomas (11.8%).

The maximum percentage of patients in this study belonged to the 30-35 year age group (52%), with a mean age of 30.78 years. This differs slightly from the study by Sebbag L and colleagues [7], which reported a median age of 36.6 years.

In the present study, 10% of patients demonstrated ASRM stage I adhesions. According to Shokeir and colleagues [8], intrauterine adhesions formed immediately post-operatively are histologically distinct from those appearing longer after surgery. IUAs are predominantly composed of grade I versus grade II/III lesions. Early office hysteroscopy facilitates lysis of newly formed, thin and filmy adhesions, whereas delayed adhesions tend to be thick and fibrous, requiring more extensive surgical lysis.

The cornerstone of patient-centered surgical practice rests upon informed patient choice based on comprehensive knowledge of risks and benefits of all treatment options. Intrauterine adhesions represent a well-known complication of myomectomy with potentially devastating effects on future reproductive potential. Unfortunately, physicians' ability to counsel patients on IUA risk following different myomectomy modalities is limited by the absence of comparative studies. A randomized trial assessing IUA risk after different myomectomy approaches may have limited current clinical utility given the existing evidence supporting the use of the least invasive modality that is surgically feasible (personalized care approach).

In the present study, FIGO Grade 1 myomas represented the maximum percentage of cases (58%). The fibroid size distribution demonstrated 56% of cases with fibroids measuring less than 2 cm and 30% with fibroids ranging 2-3 cm, while 14% had fibroids measuring 3-4 cm. Bhandari and colleagues [9] reported 2% mild post-operative intrauterine adhesions following treatment of fibroids less than 5 cm in size.

The optimal interval for second-look hysteroscopy is 6-8 weeks post-operatively. Early dissection during second-look hysteroscopy is believed to provide positive outcomes regarding ultimate risk of developing new synechiae. Some authors recommend very early hysteroscopy [10]; however, solid evidence for such claims remains limited. A limitation of this study involves the various intervals between operative and office hysteroscopy, though most procedures were performed early post-operatively as second-look procedures.

Yang and colleagues [11] reported data on 153 women undergoing hysteroscopic myomectomy for single or multiple myomas, stratified into 4 groups receiving different IUA prevention strategies. Diagnostic office hysteroscopy performed 1-3 months post-operatively revealed that post-operative adhesions are common in women with apposing myomas (despite IUD placement) but were absent in all 7 women (100%) undergoing office hysteroscopic early lysis. In the present study, all patients were undergoing single myoma treatment.

Conclusion

With our experience in this prospective study, we can affirm that early second-look hysteroscopy represents an effective procedure for diagnosis and removal of newly formed post-operative intrauterine adhesions following hysteroscopic myomectomy.

This approach facilitates prevention of adhesion progression to severe grades, thereby reducing the risk of menstrual abnormalities stemming from consequent dense synechiae formation. Early lysis of intrauterine adhesions improves menstrual patterns and reproductive outcomes in our patient population.

Conflict of Interest

Not available.

Financial Support

Not available.

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