

Research Article

Operative Hysteroscopy for Subfertile Women: An Observational Retrospective Study on the Structural Patterns of Intrauterine Pathology

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Abstract

Background: Infertility is a widespread condition, and intrauterine abnormalities are common contributors. Operative hysteroscopy is an important diagnostic and therapeutic tool in infertility management.

Objective: To describe the patterns of intrauterine pathology identified by operative hysteroscopy and confirmed by histopathology among infertile women.

Methods: This retrospective observational study was conducted at the International Medical Center on infertile women undergoing operative hysteroscopy between 2014 and 2018. Clinical and histopathological data were extracted from medical records. Statistical analysis was performed using SPSS version 26, with significance set at $p < 0.05$.

Results: Among 113 women, 59.3% were older than 35 years and 67.3% were overweight or obese. Hysteroscopic findings included endometrial polyps (46%), normal cavity (24.8%), and leiomyomas (18.6%). Histopathology confirmed polyps in 52.5%, leiomyomas in 12.4%, and normal findings in 32.7%. There was a significant correlation between hysteroscopic and histopathological diagnoses ($p < 0.05$).

Conclusion: Endometrial polyps and leiomyomas were the most common intrauterine abnormalities among infertile women undergoing hysteroscopy. The high diagnostic concordance highlights hysteroscopy's essential role in infertility workups.

Keywords: Infertility; Operative hysteroscopy; Endometrial polyp; Uterine leiomyoma; Subfertility

Introduction

Infertility affects up to 15% of couples worldwide, with uterine abnormalities accounting for 10–15% of female infertility cases. Hysteroscopy is considered the gold standard for evaluating the uterine cavity, offering the dual advantage of diagnosis and treatment in a single session. This study aims to describe the structural intrauterine pathologies detected via operative hysteroscopy among infertile women and to compare intraoperative findings with histopathological diagnoses.

Methods

This was an observational, retrospective study conducted on infertile females who visited an assisted reproductive techniques clinic in the International Medical Center from 2014–2018. Data were collected from patient files. Inclusion criteria were women who sought infertility treatment and underwent operative hysteroscopy. Patients lost to follow-up were excluded. The primary outcome was to determine the patterns of intrauterine abnormalities as diagnosed by operative hysteroscopy and confirmed by histopathology. Independent variables included age, height, weight, and BMI.

Data were statistically analyzed using SPSS version 26. To assess associations between variables, Fisher's Exact Test was applied. Qualitative data were expressed as frequencies and percentages, while quantitative data were presented as means and standard deviations (Mean $\pm$ SD). A p -value of < 0.05 was considered statistically significant.

Results

Among the 113 patients studied, 59.3% were over the age of 35 years with a mean age of 37.83 ± 7.07 years. Most patients (67.3%) were overweight (30.1%) or obese (37.2%), with a mean BMI of 29.15 ± 5.7 kg/m². Hysteroscopic findings (Figure 1) revealed polyps in 46%, normal uterine cavity in 24.8%, and leiomyomas in 18.6%. Histopathological analysis (Figure 2) confirmed polyps in 52.5%, normal tissue in 32.7%, and leiomyomas in 12.4% of patients.

No statistically significant association was found between patient age or BMI and histopathological findings (Tables 2 and 3). However, there was a significant correlation between the gross intrauterine findings and histopathological results (Table 4), with a p -value < 0.05 .

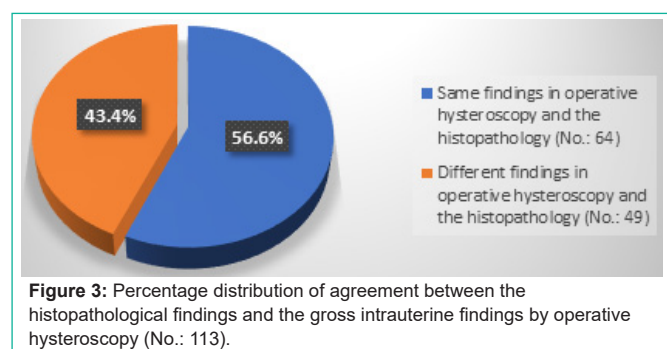
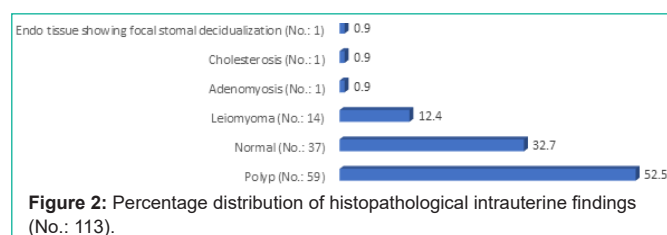
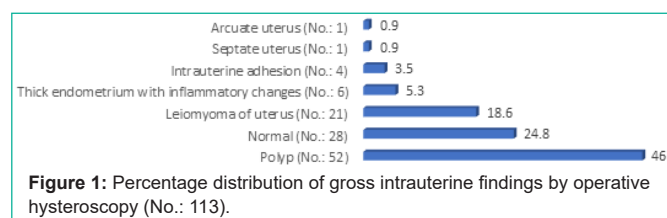


Table 1: Distribution of studied participants according to their demographic characteristics and body mass index (BMI) (No.: 113).

Variable	No. (%)
Age (years)	
≤35	46 (40.7)
>35	67 (59.3)
Age (years) (Mean ± SD)	37.83 ± 7.07
BMI categories	
Normal weight	25 (22.1)
Overweight	34 (30.1)
Obese	42 (37.2)
NA	12 (10.6)
BMI (kg/m ²) (Mean ± SD)	29.15 ± 5.7

Agreement between operative hysteroscopy and histopathology findings was found in 56.6% of patients (Figure 3).

Discussion

This retrospective study evaluated the patterns of intrauterine abnormalities among subfertile women undergoing operative hysteroscopy and compared intraoperative findings with histopathological confirmation. The results demonstrated that endometrial polyps and leiomyomas were the most common abnormalities, with hysteroscopic impressions showing high diagnostic concordance with histopathology.

The predominance of endometrial polyps (46% hysteroscopic; 52.5% histopathological) is consistent with prior reports identifying polyps as the leading intrauterine lesion in infertile women [1,2]. Several studies have highlighted their role in impairing implantation through mechanical interference, altered endometrial receptivity, and local inflammatory changes [3]. The relatively high prevalence

Table 2: Relationship between and histopathological findings participants' age, BMI categories and gross intrauterine findings by operative hysteroscopy (No.: 113).

Variable	Histopathology findings						Fisher's Exact Test	p-value
	Adenomyosis No. (%)	Cholesterosis No. (%)	Endo tissue showing focal stromal decidualization No. (%)	Leiomyoma No. (%)	Normal No. (%)	Polyp No. (%)		
Age group								
≤35	0 (0.0)	1 (100)	0 (0.0)	3 (21.4)	16 (43.2)	26 (44.1)	5.1	0.357
>35	1 (100)	0 (0.0)	1 (100)	11 (78.6)	21 (56.8)	33 (55.9)		
BMI categories								
Normal weight	0 (0.0)	0 (0.0)	1 (100)	1 (8.3)	11 (32.4)	12 (23.1)	9.01	0.52
Overweight	0 (0.0)	0 (0.0)	0 (0.0)	6 (50)	9 (26.5)	19 (36.5)		
Obese	1 (100)	1 (100)	0 (0.0)	5 (41.7)	14 (41.2)	21 (40.4)		
Gross intrauterine findings								
Arcuate uterus	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (2.7)	0 (0.0)	13.67	<0.001
Intrauterine adhesion	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (8.1)	1 (1.7)		
Leiomyoma of uterus	0 (0.0)	0 (0.0)	0 (0.0)	12 (85.7)	4 (10.8)	5 (8.5)		
Normal	1 (100)	1 (100)	0 (0.0)	1 (7.1)	13 (35.1)	12 (20.3)		
Polyp	0 (0.0)	0 (0.0)	1 (100)	1 (7.1)	11 (29.7)	39 (66.1)		
Septate uterus	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.7)		
Thick endometrium with inflammatory changes	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	5 (13.5)	1 (1.7)		

observed in our cohort may also reflect the advanced reproductive age of the study population, with 59.3% of patients older than 35 years—a factor known to increase the risk of endometrial polyps [4].

Leiomyomas were the second most frequent pathology (18.6% hysteroscopy; 12.4% histopathology). Submucosal fibroids, particularly those distorting the cavity, have been strongly associated with reduced fertility and poorer outcomes of assisted reproductive technologies (ART) [5,6]. Although the prevalence of leiomyomas in our series was lower than polyps, their clinical significance remains considerable, as surgical correction may restore normal endometrial anatomy and improve pregnancy rates [7].

Interestingly, nearly one-third of women (32.7%) had no histopathological abnormalities despite suspected lesions at hysteroscopy. This highlights both the strengths and limitations of hysteroscopy as a diagnostic tool. While hysteroscopy is widely considered the gold standard for intrauterine evaluation [8], over-interpretation of benign findings such as irregular endometrium, or technical factors related to visualization, may explain discrepancies [9]. Nonetheless, the significant statistical correlation ($p < 0.05$) between hysteroscopic and histopathological diagnoses in our study reinforces the reliability of operative hysteroscopy in clinical decision-making.

Obesity was common in this cohort, with 67.3% of patients overweight or obese, reflecting global trends linking higher BMI to subfertility [10]. However, we did not observe a statistically significant association between BMI and the presence of intrauterine pathology. This finding suggests that while obesity is a well-recognized risk factor for infertility, its effect may be mediated through mechanisms beyond structural abnormalities, such as ovulatory dysfunction or metabolic derangements [11,12]. Similarly, age showed no significant association with histopathological outcomes, although it remains an established determinant of fertility potential [13].

Our findings support the dual diagnostic and therapeutic value of operative hysteroscopy. By allowing real-time identification and removal of intrauterine lesions, hysteroscopy reduces the need for multiple procedures and provides immediate tissue confirmation [14]. This is especially relevant in infertility management, where minimizing delays is crucial.

Strengths and Limitations

The strengths of this study include its relatively large sample size within a single center and the systematic comparison between hysteroscopic and histopathological findings. However, several limitations should be acknowledged. The retrospective design limited control over data completeness and potential confounders such as duration of infertility, type of infertility (primary vs. secondary), and prior ART outcomes. Furthermore, the study did not assess reproductive outcomes following hysteroscopic intervention, which

would provide valuable insight into the clinical significance of the detected abnormalities [15].

Clinical Implications and Future Research

Given the high prevalence of polyps and fibroids, routine consideration of hysteroscopy in infertility work-ups appears justified, particularly prior to ART cycles [16]. Future prospective studies with long-term follow-up are warranted to evaluate the impact of hysteroscopic treatment on conception and live birth rates. Additionally, stratifying outcomes by age, BMI, and type of infertility could further clarify the interplay between patient characteristics and intrauterine pathology.

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