

# Hysteroscopic Management of Intrauterine Pathologies: A Case Series of 296 Patients

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## ABSTRACT

**Aim:** To discuss the incidence of various hysteroscopic findings in patients of infertility, abnormal uterine bleeding (AUB), and postmenopausal bleeding and to compare the prevalence of various uterine pathologies in patients of primary and secondary infertility.

**Materials and methods:** This is a retrospective observational study, which evaluated 296 patients who underwent diagnostic hysteroscopy for evaluation of primary or secondary infertility, AUB, and postmenopausal bleeding over a period of 18 months in a Gynae-endoscopy Unit. Detailed hysteroscopic evaluation of the endocervical canal and uterine cavity in all recruited cases was done by the same surgeon and the data were collected by reviewing the case records.

**Results:** Among the 296 cases analyzed, 157 cases were of primary infertility, 81 cases were of secondary infertility, 45 cases were of AUB, and 13 cases presented with postmenopausal bleeding. Among the primary infertility patients, 58.6% had abnormal findings on hysteroscopy, while among the secondary infertility patients, hysteroscopy revealed abnormalities in as high as 72.5% cases. In the present study, uterine synechiae was the most common abnormality detected among the infertile patients. Endometrial polyps were the most common pathology detected among patients with AUB and postmenopausal bleeding.

**Conclusion:** Hysteroscopy is a minimally invasive and highly safe technique to directly visualize the endocervical canal, uterine cavity, and tubal ostia. It has an added advantage of treating the pathology in the same sitting, thus improving the clinical outcomes. Based on our findings, we conclude that uterine pathologies are a major contributor in causing infertility and menstrual irregularities, which are missed on blind modalities like hysterosalpingography and dilatation and curettage.

**Clinical significance:** This article stresses on the use of hysteroscopy as a primary diagnostic modality in evaluating patients of infertility, AUB, and postmenopausal bleeding in order to increase the detection rates of uterine pathologies.

**Keywords:** Abnormal uterine bleeding, Asherman's syndrome, Diagnostic hysteroscopy, Infertility, Intrauterine pathologies.

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## INTRODUCTION

Hysteroscopy is a minimal invasive technique to directly visualize the endocervical canal, uterine cavity, and tubal ostia using a telescope. Since the early 1980s, hysteroscopy has opened up new diagnostic horizons for the evaluation of patients with infertility and abnormal uterine bleeding (AUB) by overcoming the inherent limitations of blind procedures like dilatation and curettage. In recent years, newer techniques and thinner telescopes have evolved that allow office hysteroscopy to be performed in outpatient settings without the use of any kind of anesthesia or prior cervical dilatation. The technical innovations have now revolutionized the field of hysteroscopy, making it possible to perform a comprehensive endoscopic examination of the uterine cavity and do a vast majority of surgical procedures with better results than those achieved by traditional technique.

The major uterine pathologies encountered during workup for infertility are endocervical polyps, endometrial polyps, uterine anomalies, submucous fibroids, and uterine synechiae. Transvaginal scan is a noninvasive diagnostic modality, but has poor sensitivity in detecting endometrial polyps, submucous fibroids, and intrauterine adhesions. Hysterosalpingography (HSG) is a traditional technique used to evaluate the uterine cavity and fallopian tubes in infertile patients. Filling defects because of endometrial polyps, fibroids, or uterine synechiae and partial failure of fusion of Müllerian ducts can be suspected but not always proven by HSG. In about one-third cases with normal findings on HSG, uterine or cervical abnormalities can still be detected by hysteroscopy, which might be responsible for poor reproductive outcomes.<sup>1</sup> The main advantage of hysteroscopy over HSG is its capability to directly visualize the cavity and hence,

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accurately diagnose synechia, polyps, and submucous fibroids which are frequently missed by HSG.

The World Health Organization recommends the use of hysteroscopy only when clinical or complementary examinations like ultrasound and HSG suggest intrauterine abnormality or after *in vitro* fertilization (IVF) failure.<sup>2,3</sup> Nowadays, many developed countries have adopted hysteroscopy as a first-line diagnostic modality in the workup of infertile patients as it is associated with high sensitivity and specificity, and simultaneous intervention can be performed in the same sitting. In cases of postmenopausal bleeding, hysteroscopy and directed biopsy of the suspicious lesion instead of blind curettage has become the norm of gynecological practice. The aim of this study is to discuss the hysteroscopic findings in 296 patients comprising of infertility, AUB, and postmenopausal bleeding and also to compare the different uterine abnormalities based on age and type of infertility (primary or secondary). This article adds to the existing literature supporting the use of hysteroscopy in the above-mentioned settings with minimal complications and high success rates.

## MATERIALS AND METHODS

This is a retrospective observational study of 296 patients who underwent diagnostic or operative hysteroscopy for workup of infertility, AUB, and postmenopausal bleeding at the Gynae-endoscopic Unit of a multispecialty teaching hospital over a period of 18 months. The findings were noted from the available clinical records.

All the women underwent a detailed clinical evaluation followed by a written and informed consent prior to the procedure. Diagnostic hysteroscopy was performed using a 2.9 mm BETTOCHI hysteroscope under general anesthesia by the same surgeon (RM). Distension of the uterine cavity was achieved using normal saline with the help of pressure bag or hysteromat. Endocervical canal was evaluated followed by careful observation of the endometrium, uterine cavity, all four uterine walls, and tubal ostia. Operative procedures like removal of polyps, submucous fibroids, adhesiolysis, tubal cannulation, metroplasty, and septoplasty were performed using appropriate techniques in the same sitting. All the procedures were video recorded for future reference. The findings were recorded using the clinical records

of the patients and statistical analysis was done using Fisher's exact test and a p-value <0.05 was considered significant.

## RESULTS

Hysteroscopy was performed in 296 patients, among whom 157 (53.04%) women had primary infertility, 81 (27.36%) women had secondary infertility, 45 (15.20%) women had AUB, and 13 (4.39%) women presented with postmenopausal bleeding. Operative procedures during hysteroscopy were performed whenever indicated to improve reproductive outcome in infertility patients along with diagnostic laparoscopy in all the cases.

Among 157 primary infertility patients with an age range of 20 to 49 years, 104 (66.24%) women were aged ≤30 years, while 53 (33.75%) were above 30 years. The age range was similar in the secondary infertility group, i.e., 24 to 50 years wherein 29 out of 81 (35.80%) women were aged ≤30 years and rest of the 52 (64.19%) women were >30 years.

In the primary infertility women at ≤30 years of age, hysteroscopy was found to be abnormal in 59/104 cases (56.7%), while in >30 years group, hysteroscopy was abnormal in 33/53 (62.24%) patients, and this difference is not significant, with a p-value of 0.10 (Table 1).

In the secondary infertility group, 20/29 (68.96%) women aged ≤30 years had abnormal findings on hysteroscopy, while 38/52 (73.07%) women aged >30 years were found to have single or multiple abnormal findings on hysteroscopy, although this age-wise difference was not significant (Table 2).

Primary and secondary infertility groups were compared, and it was found that 92/157 (58.59%) women with primary infertility had one or multiple intrauterine pathologies as against 58/81 (71.60%) women with secondary infertility. This difference among the above two groups is found to be significant, with a p-value of 0.0163 (Table 3).

Among 92 women of primary infertility who had abnormal findings on hysteroscopy, 17 (18.47%) had multiple pathologies, while 12 out of 58 women (20.68%) of secondary infertility had multiple abnormal findings on hysteroscopy. The various abnormal findings on hysteroscopy among all infertility patients, including

**Table 1:** Incidence of abnormal hysteroscopic findings in primary infertility patients at ≤30 years and >30 years

Hysteroscopic findings	Age ≤ 30 years (n = 104)	Age > 30 years (n = 53)	p-value <sup>a</sup>
Normal	45 (43.26%)	20 (37.73%)	0.109
Abnormal	59 (56.73%)	33 (62.24%)	

<sup>a</sup>Fisher's exact test

**Table 2:** Incidence of abnormal hysteroscopic findings in secondary infertility patients at ≤30 years and >30 years

Hysteroscopic findings	Age ≤ 30 years	Age >30 years	p-value <sup>a</sup>
Normal	9 (31.03%)	14 (26.92%)	0.185
Abnormal	20 (68.96%)	38 (73.07%)	

<sup>a</sup>Fisher's exact test

**Table 3:** Incidence of abnormal hysteroscopic findings in primary and secondary infertility patients

Hysteroscopic findings	Primary infertility, n = 157	Secondary infertility, n = 81	p-value <sup>a</sup>
Normal	65 (41.04%)	23 (28.39%)	0.0163
Abnormal	92 (58.59%)	58 (71.60%)	

<sup>a</sup>Fisher's exact test

primary and secondary infertility patients, are discussed in Table 4.

- Cervicoisthmic abnormalities: These included cervical adhesions and cervical polyps; cervical adhesions were found in 4/238 (1.68%) and endocervical polyps were seen in 11/238 (4.62%) women with infertility, and these were more common in primary infertility patients (10/11). One case of primary infertility had an endocervical growth, which was later on proved to be cervical adenocarcinoma on histopathology.
- Uterine cavity abnormalities:
  - Uterine synechiae/Asherman's syndrome was found in as high as 73/238 (30.67%) cases and was the most frequent finding in the present study. The severity of uterine synechiae varied with grade I Asherman's syndrome (mostly singular or fundal adhesions) comprising most of the cases in both primary and secondary infertility group. Two women with secondary infertility with uterine synechiae had old embedded bony spicules in their uterine cavity.
  - Septate uterus was the second most common abnormality detected in this study affecting 25/238 (10.50%) cases. Among these 25 cases, 13 patients had partial septum, while the remaining 12 cases were of complete septum. Again the primary and secondary infertility patients had comparable number of septate uterus (14 and 11 respectively). Among the other Müllerian anomalies, bicornuate uterus was found in 3/238 (1.26%) cases and unicornuate uterus was found in 2/238 (0.84%) women, both of them were secondary infertility cases.
  - Endometrial polyp was the third common finding affecting 19/238 (7.98%), 7 women had multiple endometrial polyps in their uterine cavity and 5 women had associated endocervical polyp as well. Endometrial polyps were more common among the primary infertility patients as against secondary infertility group (13 and 6 respectively).
  - Submucosal fibroids were noted in 13/238 (5.46%) cases, among them type II fibroids were more common and were more frequently seen in cases of primary infertility as against secondary (11 and 2 respectively).

**Table 4:** Various hysteroscopic findings in primary and secondary infertility patients

Hysteroscopic findings	Primary infertility, n = 157	Secondary infertility, n = 81	p-value
Cervical adhesions	2 (1.27%)	2 (2.46%)	0.304
Endocervical polyp	11 (7%)	1 (1.23%)	0.038
Uterine synechiae	41 (26.11%)	32 (39.50%)	0.033
Septate uterus	14 (8.91%)	11 (13.58%)	0.093
Endometrial polyps	13 (8.28%)	6 (7.40%)	0.196
Submucous fibroids	11 (7%)	2 (2.46%)	0.089
Bicornuate uterus	1 (0.63%)	2 (2.46%)	0.229
Unicornuate uterus	0	2 (2.46%)	0.114
Tubular cavity	1 (0.63%)	2 (2.46%)	0.229
Endometrial inflammation	4 (2.54%)	3 (3.70%)	0.264
Acute anteversion	3 (1.91%)	1 (1.23%)	0.393
Ostial abnormality	8 (5.09%)	6 (7.40%)	0.175

- Tubular or hypoplastic cavity was noted in 3/238 (1.26%) cases and 2 of them were secondary to severe uterine fibrosis in secondary infertility patients.
- Endometrial inflammation was seen in 7/238 (2.94%) cases.
- Acutely anteverted uterus was seen in 4/238 (1.68%) cases, which could also be one of the factors leading to difficulty in conception as in all of these women rest of the endocervical canal, uterine cavity, and tubal ostia were found to be normal on hysteroscopy.
- Ostial abnormalities: Periostial adhesions leading to partial or complete blockage was found in 14/238 (5.8%) cases. Eight patients had partial ostial block, while six had complete ostial block, among which two patients had bilateral blockage.
 

Among the 45 cases of AUB, hysteroscopy was found to be normal in 19 women (42.22%), while the most common abnormal finding was endometrial polyps found in 16 (35.55%), 4 cases (8.88%) had endometrial hyperplasia, 4 (8.88%) women had submucous fibroid, 1 (2.22%) woman had adenomyosis-like picture of the endometrium, and 1 (2.22%) woman had old retained products of conception. Endometrial biopsy was taken in all the cases of AUB for histopathological evaluation, besides removal of the pathology like submucous fibroids and polyps.

Postmenopausal bleeding was the indication for hysteroscopy in 13 cases, the most common finding was endometrial polyp seen in 5 (38.46%) women, 4 (30.76%) patients had atrophic endometrium, 2 (15.38%) women had endometrial hyperplasia, 1 (7.69%) patient had a necrotic, friable growth that on histopathology proved to be endometrial carcinoma, and 1 (7.69%) patient had a distorted endometrial cavity because of an intramural fibroid.



## DISCUSSION

Hysteroscopy is now increasingly being adopted as the first line of diagnostic modality in the workup of patients with infertility, AUB, and postmenopausal bleeding. It has an obvious advantage of direct visualization of the pathology and thus increased detection rates as compared with transvaginal ultrasound (TVS) and HSG. The only advantage of HSG over hysteroscopy is the evaluation of tubal course, caliber, and patency, but this is usually overcome by combining a diagnostic laparoscopy along with hysteroscopy. Both hysteroscopy and laparoscopy are minimally invasive methods associated with great safety margin and high accuracy.

Several studies have proven that hysteroscopy is a much more accurate method than other diagnostic modalities in the workup of infertility.<sup>1,4</sup> Among the 296 patients who underwent hysteroscopy in this study, the most common indication was primary infertility (53.04%), secondary infertility was present in 27.36% cases, AUB was the indication in 15.20% cases, while the remaining 4.39% women presented with postmenopausal bleeding. Abnormal findings on hysteroscopy included cervical adhesions, endocervical polyps, endometrial polyps, uterine synechiae, submucous fibroids, endometrial inflammation, uterine anomalies, ostial abnormalities, endometrial hyperplasia, retained products of conception, and deformed cavity in various groups of patients. This was a retrospective observational study with no control group and an inhomogeneous preoperative workup; hence, the comparison of various diagnostic modalities for intrauterine pathologies could not be compared by our data. Based on the understanding that hysteroscopy is the best approach for evaluating the uterine cavity, all our patients underwent the procedure based on their symptomatic indication.

Abnormal hysteroscopic findings were noted in 58.59% patients of primary infertility and 71.60% cases of secondary infertility, and this difference was significant ( $p = 0.0163$ ), suggesting that uterine pathologies are a more common contributing factor in the secondary infertility group (Table 3). This finding is against the findings of Sahu et al,<sup>5</sup> who reported a comparable incidence of 33 and 39% in the primary and secondary infertility group respectively. Previous studies have reported an incidence range of 7.2 to 64%<sup>6-11</sup> for abnormal hysteroscopic findings in patients of infertility, which could be explained by observer's variability, demographic differences, type of infertility, and considering preoperative findings on TVS and HSG, which might have influenced patient selection. When the risk of uterine pathologies was compared between age  $\leq 30$  years and  $> 30$  years, no significant difference was found in both primary and secondary

infertility groups (Tables 1 and 2), while Koskas et al<sup>11</sup> in their series of 557 cases of infertility found that the proportion of abnormal findings on hysteroscopy increased with age, ranging from 30% at 30 years to more than 60% after 42 years. Also Magos et al<sup>12</sup> compared hysteroscopic abnormalities before and after 38 years of age and found no significant difference between the two groups.

In this study, uterine synechiae/Asherman's syndrome was the most common finding affecting 30.67% of infertile patients, and the incidence was comparable between the primary and secondary infertility group (Table 4) as against the common theory, which associates formation of uterine synechiae with uterine curettage in postabortal or postpartum period. Other studies have reported an incidence ranging from 0.83 to 20%.<sup>5,13,14</sup> Grade I Asherman's syndrome with either fundal synechiae or singular fibrous bands was more frequent affecting 32/238 women while grade IV Asherman's causing complete uterine cavity obliteration was seen in 9 women, 7 of them suffered from secondary infertility and had prior history of uterine curettage. Oliveira et al<sup>15</sup> also found intrauterine adhesions in 10% of patients with repeated IVF failure of whom none had undergone previous uterine manipulation, thus obviating the need to define other factors for this pathology. Depending on the severity, treatment of Asherman's syndrome was done in single or multiple sittings using scissors and postoperatively, these patients received high dose estrogen and progesterone supplementation along with insertion of intrauterine device in order to prevent reformation of adhesions. Yu et al<sup>16</sup> hysteroscopically operated 85 females with Asherman's syndrome and found excellent therapeutic results.

The incidence of uterine malformation among infertile patients is reported to be ranging from 1 to 26%, with a mean incidence of 3.4%.<sup>4</sup> Uterine septum was the most common uterine malformation noted in the present study with an incidence of 10.50%, which was suspected in almost all the patients during preoperative investigations like TVS and HSG, but both of these modalities are not confirmatory and cannot differentiate between bicornuate uterus and septate uterus. Even during hysteroscopy, one has to perform a diagnostic laparoscopy along, which is also important while correcting the pathology. In the present study, all the septa (irrespective of primary or secondary infertility) were treated successfully with the use of scissors or electrosurgery without any major complications, as the reproductive outcomes improve dramatically after surgical correction. Septal resection is now recommended even in the absence of prior history of recurrent abortions.<sup>17</sup>

Endocervical polyps were detected in 4.62% infertile patients and endometrial polyps were diagnosed in both primary and secondary infertility groups with a combined

incidence of around 8% (Table 4). The probable role and incidence of endometrial polyps in infertile patients is not clear as most of them remain clinically asymptomatic, but Shokeir et al<sup>18</sup> reported endometrial polyps in 16% of their infertility cases and found such lesions to be more common in the unexplained infertility group. They also reported a 50% pregnancy rate after hysteroscopic polypectomy, confirming the adverse role of endometrial polyps in causing infertility. In our study also, all the polyps irrespective of size, type, and indication were excised hysteroscopically. In AUB, endometrial polyps were seen in quite a high number of patients, i.e., around 35%, in a large series of 5,103 patients with AUB, Fuentes<sup>19</sup> reported a 12% incidence of endometrial polyps.

In the present study, the incidence of submucous fibroids was found to be 5.46% (ranging from size 2 to 6 cm) in the infertility group and 2.22% in the AUB group. Submucous myomas have a reported incidence of 1 to 2.4% in infertile patients and are known to distort the uterine cavity, cause alteration of uterine contractility, and lead to adverse inflammatory and vascular changes, which impair the implantation site receptivity, thus mandating their removal prior to treatment of these women.

The reported incidence of complications during hysteroscopy is 1 to 3%, which include cervical lacerations, formation of false tracts, uterine perforation, bleeding, sepsis, fluid overload, and air embolism. In the present case series, the complication rate was extremely low with just one case of uterine perforation in a case of postmenopausal bleeding. These data prove that with required training and expertise, hysteroscopy is an extremely safe surgery.

Hysteroscopy, in present day and age, has earned its place as the first-line management modality in cases of infertility and AUB. Various studies including the present article report a 100% success in using hysteroscopy as a diagnostic and therapeutic measure in patients of infertility.<sup>20,21</sup> In AUB patients, hysteroscopy is an essential preliminary surgery that can efficiently diagnose and treat intrauterine pathologies; targeted biopsies can be taken to rule out malignancies in such cases and those with postmenopausal bleeding with increased accuracy. The modern-day equipments have made it a relatively easy and safe procedure with minimal hospital stay, lesser morbidity, and prompt recovery. Hysteroscopy detects intrauterine pathologies in as high as 30% cases with normal HSG, especially pathologies like uterine synechiae, endometrial or endocervical polyps, submucous fibroids, and endometrial inflammation.<sup>22</sup>

## CONCLUSION

This article shows that there is a high incidence of intrauterine pathologies affecting reproductive outcomes in infertility patients and causing menstrual irregularities.

Endometrial polyps, ostial abnormalities, and uterine septum are common findings in infertility cases, but in the present study, Asherman's syndrome had an exceptionally high incidence. Similarly, the incidence of endometrial polyps in AUB cases was also very high as compared with previous studies in the literature. This rise can be explained by the fact that hysteroscopy was performed in every case irrespective of their normal TVS or HSG, which is usually not done in routine clinical practice. To conclude, authors would like to state that hysteroscopy has now reached exceptional levels of reliability as it permits better evaluation of uterine cavity as compared with HSG or ultrasound; thus, it should now become a routine office procedure with wider acceptance among the gynecological community, although an integrated approach combining hysteroscopy, HSG, hysterosonography, or microlaparoscopy must be done if needed whenever evaluation of tubal integrity is important.

## CLINICAL SIGNIFICANCE

This article adds to the existing literature that supports the role of hysteroscopy in evaluating patients for intrauterine abnormality as they have a much higher prevalence than ever reported, and diagnosing them with an open mind would surely improve the clinical outcomes.

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