

Hysteroscopy in Uterine Anomalies: An Edge

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ABSTRACT

Hysteroscopy is the inspection of the uterine cavity by endoscopy with access through the cervix. It allows for the diagnosis of intrauterine pathology and serves as a method for surgical intervention at the same time. Congenital uterine anomalies result from abnormal formation, fusion, or resorption of the Müllerian ducts during fetal life. These anomalies have been associated with an increased rate of miscarriage, preterm delivery, and other adverse fetal outcomes. In the past whenever a patient presented with Müllerian fusion defect that was thought to be the cause of recurrent pregnancy loss, a laparotomy was performed. They required lengthy anesthesia. Also the postoperative complications were more besides the trauma of a laparotomy scar. With the use of endoscopy all these problems have vanished. The diagnosis and management for uterine anomalies has become much easier and less cumbersome with the use of hysteroscopy. We report a case series (six cases) of uterine anomalies and their hysteroscopic management. It includes one case of hypoplastic gonads, one of rudimentary horn, two of bicornuate uterus, one of complete septum, and one of complex anomaly. With this, the authors would like to emphasize on the revolutionary role of hysteroscopy in the diagnosis and management of uterine anomalies and would review the literature regarding the same.

Keywords: Hysteroscopy, Infertility, Müllerian duct, Uterine anomalies.

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INTRODUCTION

Hysteroscopy is the inspection of the uterine cavity by endoscopy with access through the cervix. It allows for the diagnosis of intrauterine pathology and serves as a method for surgical intervention at the same time. Congenital uterine anomalies result from abnormal formation, fusion, or resorption of the Müllerian ducts during fetal life.¹ These anomalies have been associated with an increased rate of miscarriage, preterm delivery,

and other adverse fetal outcomes.²⁻⁷ The prevalence rates of uterine anomalies have varied between 0.06 and 38%.⁸⁻¹⁵ This wide variation is likely to be linked to the assessment of different patient populations and the use of different diagnostic techniques with variable, and yet to be determined, test accuracy as well as reliance on nonstandardized classification systems. The endoscopic technique for the management of uterine septa was first proposed by Edstrom and Fernstrom in 1970. In the past whenever a patient presented with Müllerian fusion defect that was thought to be the cause of recurrent pregnancy loss, a Jones, Strassman, or Tompkins procedure would be performed by laparotomy. They required lengthy anesthesia and also the postoperative complications were more. With the use of endoscopy all these problems have vanished. The diagnosis and management for uterine anomalies has become much easier and less cumbersome with the use of hysteroscopy. This review has assessed the ease and accuracy of hysteroscopic diagnosis of uterine anomalies.

CASE REPORTS

The authors report a series of six cases of uterine anomalies.

1. This 18-year-old was suffering from primary amenorrhea. She came to us with chief complaints of not having started with menses and poorly developed breasts. There was no history to suggest any insidious/ongoing disease process/radiation exposure. Tuberculosis and thyroid illness were ruled out. Her ultrasound and magnetic resonance imaging (MRI) showed smaller ovaries and a hypoplastic uterus (33 mm) with the endometrium not being well defined. Her chromosomal analysis was normal and on examination breasts were a little less developed, but rest of the secondary sexual characters were within the range of development. Hormonal profile was within normal but on the lower side. She was taken up for a hysteroscopy and laparoscopy for further management. Hysteroscopy showed a very small cavity with endometrium being in proliferative phase and thin (Fig. 1A). On laparoscopy ovaries were a tad smaller and the uterus too appeared smaller. Hysteroscopic cutting of septum with bilateral lateral wall metroplasty was done (Fig. 1B). She was put on high doses of sequential estrogen and progesterone therapy and was asked to follow-up. She did very well and got her

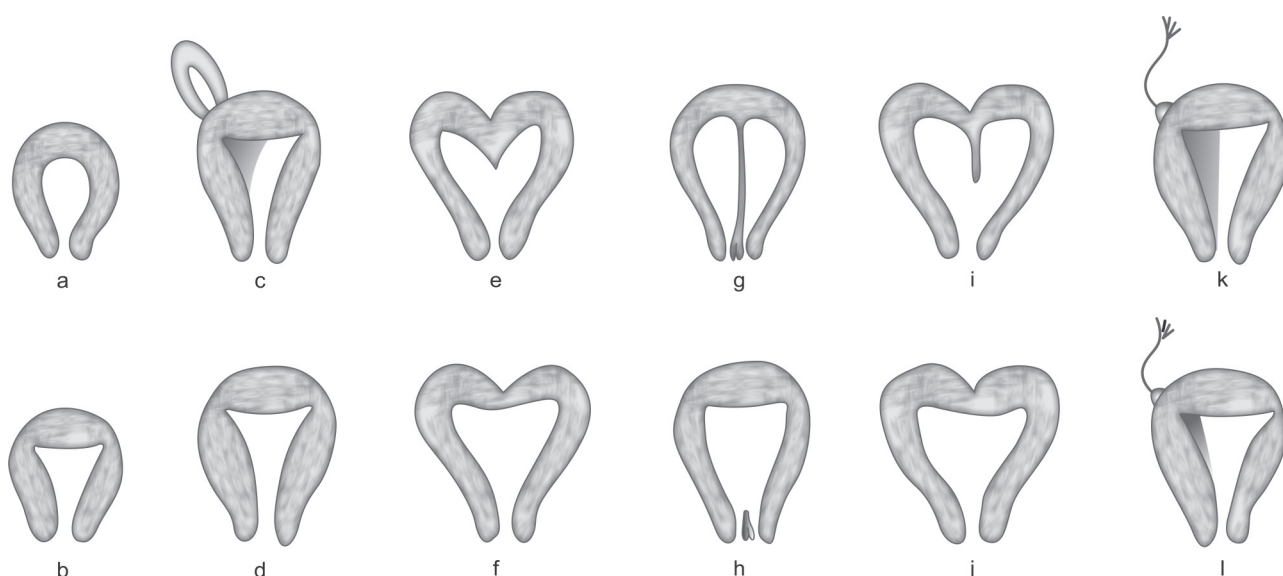
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first period after her surgery and has been regularly menstruating since then, much to her and her family's joy. Follow-up ultrasonography (USG) was done, which interestingly showed her ovaries' size to be larger and normal than before and a uterus of size 66×40×27 mm. Endometrium now was being well formed and typically triple layered.

2. A 40-year-old nulliparous lady complaining of chronic pelvic pain and severe dysmenorrhea for the past few years worsened over the past few months. She was also concerned about her future fertility options. Ultrasonography showed a unicornuate uterus with a left-sided uterine horn with an endometrial cavity; these findings were confirmed by MRI (Figs 1C and 2). The patient underwent diagnostic and operative hysteroscopy with lateral metroplasty, while diagnostic and operative laparoscopy with resection of the rudimentary horn and fulguration of endometriotic lesions. The findings on hysteroscopy were unicornuate small uterine cavity, with right-side ostia visualized. All four walls were normal; cervical canal also normal; on laparoscopy unicornuate uterus with left-sided noncommunicating rudimentary horn with an endometrial cavity was seen; B/L tubes normal; B/L ovaries: Endometriotic spots seen. Endometriotic spots were seen on the utero-sacral ligaments and bowel adherent to left pelvic wall. At the end, the cavity was much larger and adequate for conception (Fig. 1D).
3. A case of 25-year-old lady with history of one spontaneous abortion at 14 weeks, 2 years earlier. Now anxious to conceive. On hysteroscopy both cornua in the lower half were close together, simulating a septate or bicornuate uterus. In the upper part, they were further apart (Figs 1E and 3). A hysteroscopic metroplasty was done and both cavities were enlarged. Lower half of the uterine cavities were unified by cutting the adjoining myometrial tissues of both the horns using a traditional monopolar resectoscope. After the procedure the uterine horns on laparoscopy had come closer. An intrauterine device (after removing copper) was inserted and she was put on sequential hormones. Her 2nd look surgery gave a perfectly normal healed cavity (Fig. 1F).
4. A 33-year-old female came with a complaint of pain in lower abdomen, with history of secondary infertility and two miscarriages, diagnosed as complete uterine septum with two cervixes (bicollis) (Fig. 1G). A diagnostic and operative laparoscopy and hysteroscopy was advised. Hysteroscopic septal resection was performed with resectoscope by keeping both cervixes intact under general anesthesia in early proliferative phase (Fig. 1H). She conceived and delivered a term healthy baby girl by lower segment cesarean section. Intraoperatively, uterus was normal and no septum was seen.
5. A 26-year-old with history of (h/o) two miscarriages came as a case of secondary infertility. She had two spontaneous abortions at 8 and 9 weeks. Her hysterosalpingography (HSG) revealed partial uterine septum and B/L tubes patent with free spillage (Fig. 1I). Ultrasound showed bicornuate uterus. Thus a diagnostic and operative laparoscopy and hysteroscopy was advised. Hysteroscopic septoplasty was performed with scissors, and intrauterine device was inserted after removing copper coil (Figs 1J and 4). On laparoscopy, uterus was normal in size with broad fundus. Her relook hysteroscopy a month later



Figs 1A to L: Diagrammatic representation of anomalies before and after surgery

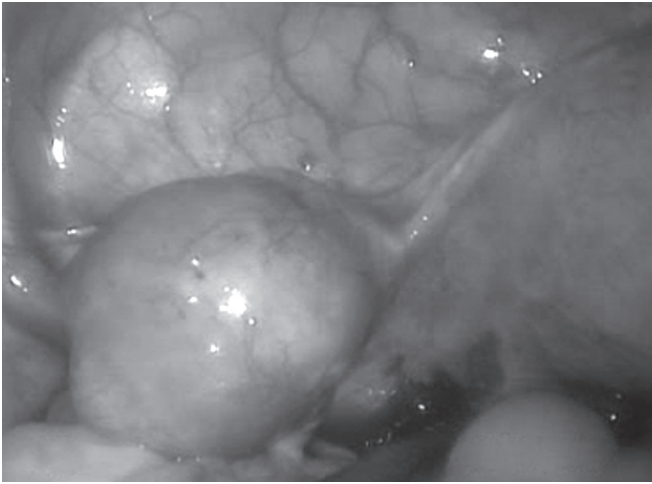


Fig. 2: Uterine horn

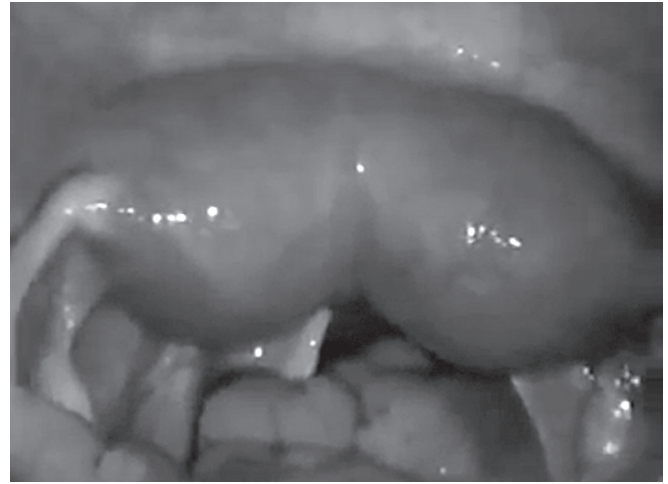


Fig. 3: Bicornuate uterus

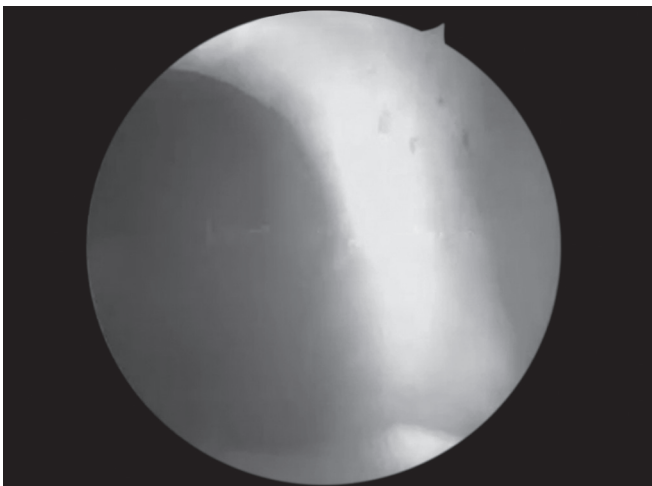


Fig. 4: Uterine septum

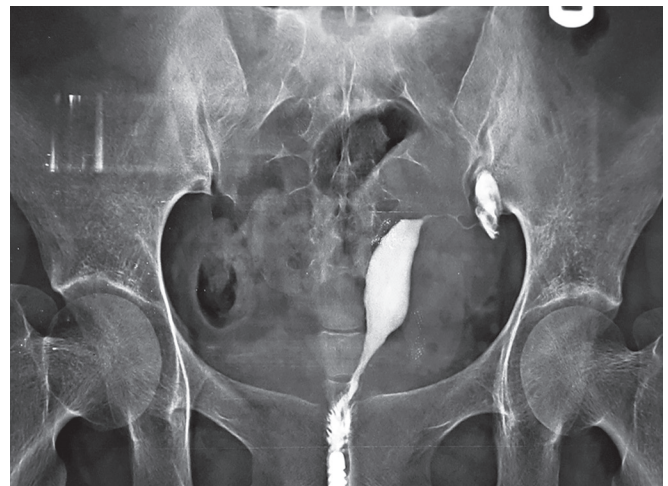


Fig. 5: Hysterosalpingograph

revealed few adhesions for which adhesiolysis was done and the cavity was normalized. She was advised for normal trial of conception. Her intrauterine pregnancy was confirmed at 6 weeks and 4 days after 6 months of surgery.

6. A 26-year-old female presented with secondary infertility. She had h/o one spontaneous abortion at 6 weeks, 3 years prior to presentation. Her HSG revealed single left cornu with free spillage (Fig. 5). The right-side cornu was not visualized. Ultrasonography showed normal study. A diagnostic and operative hysteroscopy and laparoscopy was advised. Her hysteroscopy revealed unicornuate uterus with normal proliferative endometrium. On laparoscopy, astonishing findings of uterus normal in size and shape with noncanalized right half of the uterus were seen; it also showed a noncanalized right-sided fallopian tube (Figs 1K and 6). B/L ovaries were found to be normal. Hysteroscopically, lateral metroplasty with cavity enhancement was done for her (Fig. 1L). She is posted for a relook surgery after a month.

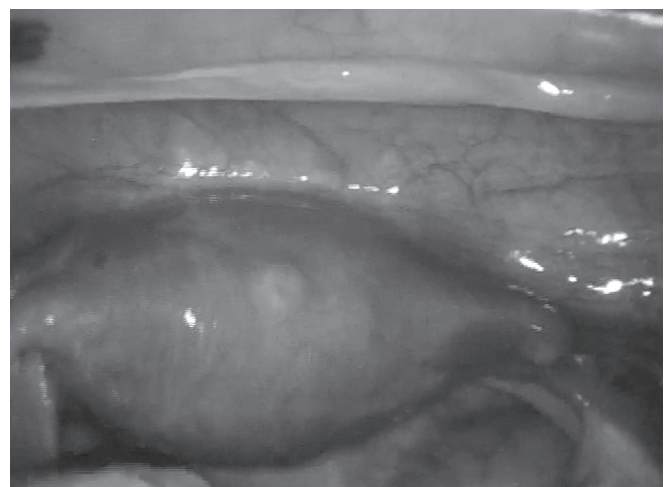


Fig. 6: Complex anomaly

DISCUSSION

Hysteroscopy has revolutionized the uterine morbidity management globally. Its advantages over traditional abdominal approach include less morbidity, less postprocedure pain, and reduced hospital stay, thereby making it

a cost-effective procedure. Given its minimally invasive approach, there is no scar formation or postoperative adhesion, which allows the maintenance of integrity of uterine wall. The recovery time before conception is shortened. Also, the probability of profuse bleeding and trauma is decreased when compared to abdominal approach. All these advantages make hysteroscopy a better option. There are different methods of performing operative hysteroscopy. It may be performed using monopolar, bipolar electrocautery, argon laser, or scissors, none of the particular modality being superior to other.^{16,17}

Gomel et al¹⁸ considered the combination of hysteroscopy and laparoscopy to be the gold standard in evaluating congenital uterine anomalies in woman with infertility. Hysteroscopy with laparoscopy offers the added advantage of concurrent treatment, as in the case of a uterine septum resection and often in complex anomalies also.

Maneschi et al¹⁹ performed diagnostic hysteroscopy in women with abnormal uterine bleeding and detected a 10% prevalence of uterine anomalies, which were associated with a significantly higher incidence of spontaneous abortion and lower cumulative live birth rates.

Hamilton et al²⁰ also suggested hysteroscopy to be the gold standard for the diagnosis of uterine anomalies.

Letterie²¹ suggested that hysteroscopy allows direct visualization of the intrauterine cavity and ostia. It is therefore very accurate in identifying congenital uterine anomalies and is often used to establish a definitive diagnosis after an abnormal HSG finding.

Soares et al²² studied 65 infertile women and concluded that hysteroscopy is very accurate in identifying congenital uterine anomalies and is often used to establish a definitive diagnosis after an abnormal HSG finding. They also found hysteroscopy to be the gold standard for diagnosis.

Homer et al¹³ did a review of septate uterus management. They also highlighted that reliable diagnosis of the septate uterus depends on accurate assessment of the uterine fundal contour. At present, the combined use of laparoscopy and hysteroscopy is the gold standard for diagnosis, although recent reports of two-dimensional (2D), transvaginal, contrast ultrasound, and of the three-dimensional (3D) ultrasound appear promising. The prevalence of the septate uterus is increased in women with repeated pregnancy loss. A meta-analysis of published retrospective data comparing pregnancy outcome before and after hysteroscopic septoplasty indicated a marked improvement after surgery. They also concluded that the hysteroscopic approach to treatment, with its simplicity, minimal postoperative sequelae, and improved reproductive outcome, has enabled a more liberalized approach to treatment, i.e., now being extended to

include not only patients with recurrent pregnancy loss and premature labor but also patients with infertility, especially if IVF is being contemplated.

Consequently, for the correct differentiation between bicornuate and septate uteri, further investigation is required, most commonly a diagnostic laparoscopy. So, we also suggest that a hysterolaparo approach in such cases is very informative. In our cases also we have used this approach for better and correct diagnosis.

Grimbizis et al⁶ considered the combination of hysteroscopy and laparoscopy to be the gold standard in evaluating congenital uterine anomalies. Hysteroscopy with laparoscopy offers the added advantage of concurrent treatment, as in the case of a uterine septum resection. Hysteroscopic treatment seems to restore an almost normal prognosis for the outcome of their pregnancies with term delivery rates of approximately 75% and live birth rates of approximately 85%. It seems, therefore, that hysteroscopic septum resection can be applied as a therapeutic procedure in cases of symptomatic patients but also as a prophylactic procedure in asymptomatic patients in order to improve their chances for a successful delivery.

Woelfer et al,²³ however, concluded that the diagnosis is mainly based on the subjective impression of the clinician performing them, and this is thought to be a limitation in the objective estimation of the anomaly.

Complications are similar to HSG, although rarely air emboli or uterine perforation may also occur. This statement is confirmed by the study of Kupesic et al.²⁴

Philbois et al²⁵ in his study has said that combined application of these endoscopic techniques is thought to be the gold standard in the investigation of women with congenital malformations and especially the uterine ones.

Zlopasa et al²⁶ conducted operative hysteroscopy on 105 infertile women with uterine anomalies. Compared with their previous pregnancies, the abortion rates were lower and delivery rates were higher in women who conceived following hysteroscopic metroplasty. Resectoscope metroplasty significantly improved pregnancy outcome in women with uterine anomalies.

Bettocchi et al²⁷ recently proposed a new method for differentiating between a septate and bicornuate uterus with the use of office hysteroscopy alone, in a procedure that may also be performed without the use of anesthesia or analgesia. Three criteria were used while assessing 260 patients with a double uterine cavity: The presence of vascularized tissue, sensitivity of the tissue based on its innervations, and its appearance at incision (if suspected to be a septum). In this series, 93.1% of the patients went on to successfully undergo an office hysteroscopic metroplasty during this procedure. In 15 of 18 (83%) patients who underwent laparoscopy,

the diagnosis of a suspected bicornuate uterus was confirmed. Ultimately, the main disadvantage of hysteroscopy is the invasiveness of the procedure which in the past was usually performed under general anesthetic. Nowadays, hysteroscopy is often performed under local anesthetic.

Saravelos et al²⁸ reviewed the specificity and sensitivity of different methods in the investigation of patients with uterine malformations. Based on their diagnostic accuracy, the diagnostic methods were categorized into four categories:

1. Class Ia: Those that are capable of identifying congenital uterine anomalies and classifying them into appropriate subtypes with an accuracy of >90%. Hysteroscopy plus laparoscopy, HSG, and 3D US belong to this class.
2. Class Ib: Those that are capable of identifying congenital uterine anomalies with an accuracy of >90% without being able to classify them into appropriate subtypes. Hysteroscopy alone belongs to this class.
3. Class II: Those that are capable of identifying congenital uterine anomalies with an accuracy of <90%. According to the available data, HSG and 2D US belong to this class.
4. Class III: This includes the investigations whose diagnostic accuracy in identifying congenital uterine anomalies are still not exactly known; MRI belongs to this class.

They also concluded based on the data derived from class Ia and b studies that the prevalence of congenital uterine anomalies is approximately 6.7% [confidence interval (CI) 95%, 6.0–7.4] in the general/fertile population and 7.3% (CI 95%, 6.7–7.9) in the infertile population. The prevalence in the infertile population is similar to that of the general/fertile population. However, there seems to be a higher prevalence of septate uteri in the infertile population, suggesting an association.²⁸

CONCLUSION

Hysteroscopy has revolutionized the uterine morbidity management globally. Its advantages over traditional abdominal approach include less morbidity, less postprocedure pain, reduced hospital stay, thereby making it a cost-effective procedure. Given its minimally invasive approach, there is no scar formation or postoperative adhesion, which allows the maintenance of integrity of uterine wall. The recovery time before conception is shortened. Direct visualization of the cavity leads to the diagnosis of many uterine anomalies which otherwise go unnoticed. These anomalies can not only be diagnosed but also can be managed at the same time.

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