



Laparoscopic and Hysteroscopic Surgery for Infertility in Bangladesh: Current Practice and Future Perspectives

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ABSTRACT

Background: Infertility is a significant reproductive-health issue, and is believed to occur in approximately 1 in every 6 individuals of reproductive age worldwide. Contemporary recommendations have been to adopt an indication based approach instead of routine laparoscopy/hysteroscopy in all patients with infertility, selected pelvic and intrauterine anomalies can be corrected by minimally invasive reproductive surgery (World Health Organization, 2025; Motan et al., 2024; Motan et al., 2023; Malhotra et al., 2024).

Objective: To give an overview about the current status of laparoscopy and hysteroscopy in the field of infertility including indications, fertility outcomes, risks and strength of evidence and changing scenario of Bangladesh.

Methods: This narrative review was carried out using structured search in PubMed/MEDLINE, Embase, Scopus, Cochrane Library, Google Scholar and Bangladesh specific databases. The search covered January 2010 - December 2025 or older if relevant to current practice (landmark trials). Infertility/subfertility was searched for along with laparoscopy, hysteroscopy, endometriosis, tubal disease, hydrosalpinx, adhesions, fibroids, polyps, uterine septum, Asherman's syndrome, pregnancy, live birth, and Bangladesh. International guidelines, systematic reviews, randomized trials, observational studies and the appropriate institutional reports from Bangladesh were taken into consideration. When evidence was relevant to clinical application in the field of fertility surgery, evidence was selected and summarized narratively, but not pooled statistically.

Results: Laparoscopy is the gold standard direct procedure for the evaluation of the peritoneal/tubal pathology when there is clear indication, but not routinely performed in the work-up of unexplained infertility (Motan et al., 2023; ASRM, 2021). While hysteroscopy can be used to detect and treat intrauterine abnormalities, it has not been consistently shown to improve live birth rates (Motan et al., 2024; Yang et al., 2020) in women who had a normal evaluation by hysteroscopy before the first IVF cycle. Strong indications exist for selected structures (hydrosalpinx prior to IVF and intrauterine adhesions and cavity-perverting disease). Surgery can positively impact intrauterine pregnancy rates that had occurred spontaneously or were viable in selected women with endometriosis, and moderate effects on pain and live birth (Bafort et al., 2020; Marcoux et al., 1997). However, it has been noted that there is a significant burden of the presence of endometriosis among infertile women in Bangladesh as per institutional records of the last few years, with no outcome register available in the country (Ahmed et al., 2026; Ahmed et al., 2025/2026).

Conclusion: Laparoscopic and hysteroscopic surgery should be reserved for selected cases and be performed after careful evaluation of the age, duration of infertility, ovarian reserve, tubal factor, male factor, imaging, prior surgery and reproductive goals. Future studies are required in the country regarding standard reporting of



the parameters of spontaneous pregnancy, clinical pregnancy, ongoing pregnancy, live birth, complications, and patient-reported outcome in Bangladesh.

Keywords: Infertility; Laparoscopy; Hysteroscopy; Bangladesh; Endometriosis; Hydrosalpinx; Myomectomy; Intrauterine adhesions; Reproductive surgery

INTRODUCTION

Infertility occurs when a couple has not conceived after 12 months of regular unprotected sexual intercourse without contraceptive. Assisted reproductive technologies (ART) should be utilized as a progression in infertility treatment once a cause and prognosis are identified and patient preferences and resources are taken into account, according to the World Health Organization, which reports that approximately 16% of people are infertile during their reproductive years. (World Health Organization, 2025).

In certain patients, laparoscopy and hysteroscopy can be directly applied and, when needed, used at the same time as ways to treat the patient. However, neither procedure is considered necessary for every patient these days. The 2023 Canadian guidelines for minimally invasive surgery also suggest that laparoscopy is not routinely recommended as part of initial evaluation of unexplained infertility and the 2024 hysteroscopy guideline states that performing hysteroscopy surgery should only be considered when there is a reasonable expectation of benefit to fertility outcome. (Motan et al., 2023; Motan et al., 2024).

Reproductive endoscopy has been introduced in the tertiary hospitals and fertility services in Bangladesh, however there is limited published data available nationally of the number of procedures performed and the reproductive outcomes available. Recent institutional studies provide local evidence, including laparoscopically diagnosed endometriosis (Ahmed et al., 2026; Ahmed et al., 2025/26). International evidence was thus amalgamated with literature from Bangladesh to find areas where there was greater national evidence and this was the approach of a narrative review.

REVIEW METHODOLOGY

Review design

The article is a narrative review and is not a systematic review or meta-analysis. The aim was to integrate the clinically relevant evidence on laparoscopy and hysteroscopy in the treatment of infertility and to contextualize this evidence in the current practice in Bangladesh.

Information sources and search period

PubMed/MEDLINE, Embase, Scopus, the Cochrane Library, Google Scholar, journal and institutional sources in Bangladesh were used to identify literature. The main search time was from January 2010 to December 2025. Earlier, significant randomized trials and systematic reviews were kept if they still applied directly to the current recommendations. Recommendations that underwent significant changes over time were given greater priority (World Health Organization, 2025; Motan et al., 2024; Motan et al., 2023; Malhotra et al., 2024).

Search terms

Searches were performed using controlled vocabulary and free-text terms such as: “infertility”, “subfertility”, “female infertility”, “laparoscopy”, “hysteroscopy”, “reproductive surgery”, “endometriosis”, “tubal factor”, “hydrosalpinx”, “salpingectomy”, “adhesiolysis”, “myomectomy”, “endometrial polyp”, “uterine septum”, “intrauterine adhesions”, “Asherman syndrome”, “pregnancy rate”, “clinical pregnancy”, “ongoing pregnancy”, “live birth”, “IVF”, “IUI”, and “Bangladesh”.

Selection criteria

The following items were prioritized: clinical practice guidelines, systematic reviews, randomized controlled



trials, or well-described cohort or institutional studies reporting fertility-related outcomes or clinically important surgical risks. Bangladeshi evidence was added if it included information relevant to the national, institutional, or local context of infertility, reproductive endoscopy, or endometriosis, or hysteroscopy. Case reports, technical reports (with no fertility information) and publications with insufficient clinical information were not used for major efficacy claims.

Evidence synthesis

Narrative synthesis of evidence was used. The outcomes were intentionally divided into: (1) symptom/pain relief; (2) anatomical correction; (3) spontaneous conception; (4) clinical/ongoing pregnancy; (5) IVF-related outcomes; and (6) live birth. The quality or certainty of evidence was stated where guidelines did so. This was not a systematic review; hence no pooled effect estimate or formal risk-of-bias meta-analysis was conducted.

BURDEN OF INFERTILITY AND BANGLADESH-SPECIFIC EVIDENCE

Overall population-based data on infertility are still not available in Bangladesh. The WHO global guideline offers the best available international context at the present time and stresses the importance of adapting evidence-based infertility pathways to the local health system in countries (World Health Organization, 2025). In Bangladesh, infertility is dealt with in public tertiary hospitals, private fertility services and specialized reproductive medicine centres, without a national infertility register to give reliable estimates of the outcomes of procedures. However, pelvic pathology among infertile women has been observed clinically in the context of institutional studies in Bangladesh.

In a cross-sectional study from BIRDEM General Hospital-2, 38.3% of 115 infertile women undergoing diagnostic laparoscopy were found to have endometriosis, with severe (stage IV) endometriosis being the most common stage in women with endometriosis (Ahmed et al., 2026). In a previous study conducted by BIRDEM, 18.9% of the 127 infertile women who were subjected to laparoscopy and dye test were found to have endometriosis (Ahmed et al., 2025/26). Any differences in these studies is likely to be a reflection of population differences or the period of the studies or referral patterns and should not be taken as a national prevalence estimate.

The evidence available in Bangladesh to support the clinical relevance of pelvic pathology is not yet sufficient to determine the national rates of spontaneous pregnancy, IVF success, live birth, or surgical complications. Therefore, statements regarding the national practice should be made in a careful manner, unless they are backed by data from a national registry or multicenter practice.

UNDERSTANDING LAPAROSCOPY AND HYSTEROSCOPY

Laparoscopy

Laparoscopy is a minimally invasive procedure in the abdomen, allowing the direct view and treatment of the pelvis at the same time if necessary. It can evaluate the tubes, the ovaries, the uterus, the peritoneum, endometriosis and adhesions. It is most useful when combined with clinical history, examination, imaging or tubal testing for the diagnosis of pelvic disease. For women with otherwise unexplained infertility (OET), routine diagnostic laparoscopy is not indicated for all women (Motan et al., 2023; American Society for Reproductive Medicine, 2021).

Hysteroscopy

Hysteroscopy allows direct visualization of the uterine cavity and allows for specific treatment of specific lesions. It can be helpful if an ultrasound examination or saline infusion sonography indicates that the uterus contains a polyp, submucosal fibroid, intrauterine adhesion, septum, retained tissue, or other cavity defect. The 2024 Canadian guideline states that hysteroscopic surgery should not be performed without a plausible and clinically relevant benefit for fertility (Motan et al., 2024).

INDICATIONS FOR MINIMALLY INVASIVE FERTILITY SURGERY

Note that the following indications are based on current evidence and do not necessarily indicate a need for surgery:

- Documented or suspected endometriosis, significant symptoms, endometrioma, advanced disease or planned operative intervention.
- In women with history suggestive of pelvic or adnexal adhesions, abnormal imaging or tubal testing, or planned surgery, consider a surgical procedure.
- In women who are undergoing IVF, hydrosalpinx can be considered for salpingectomy or proximal tubal occlusion depending on the anatomy and ovarian reserve.
- Selected tubal disease with good outcome in younger women with reasonably good chance of tubal reconstruction when IVF is an option.
- Larger intramural fibroids, or those in the cavity that are distorting, and which are anticipated to improve reproductive outcome following treatment.
- Endometrial polyps clinically (causing symptoms) or when detected during an evaluation of female infertility, especially with IUI, and where removal is clinically indicated.
- Symptomatic or clinically significant intrauterine adhesions (Asherman syndrome).
- Consulted with individual patients about uterine fibromyoma and the reasonability of their removal, as there is little evidence for routine removal of a septum in all infertile women.

STRUCTURED EVIDENCE TABLE

Table 1 summarizes the principal fertility-surgery indications and distinguishes the main outcome domains from the strength of evidence. Evidence strength is qualitative and reflects the cited guideline/review evidence rather than a new formal GRADE assessment.

Procedure / indication	Typical population	Main fertility outcome	Key evidence	Important risks / limitations	Evidence strength
Laparoscopy for unexplained infertility	Women with otherwise unexplained infertility and no specific pelvic indication	Pregnancy / live birth	Routine initial laparoscopy is not recommended; may be considered selectively after failed treatment or when pelvic pathology is suspected (Motan et al., 2023; American Society for Reproductive Medicine, 2021).	Operative complications, adhesions, cost; may delay ART	High against routine use
Laparoscopic surgery for minimal/mild endometriosis	Infertile women with laparoscopically confirmed minimal/mild disease	Spontaneous/viable intrauterine pregnancy; live birth uncertain	Cochrane review found probable increase in viable intrauterine pregnancy but no live-birth data; pain benefit uncertain (Bafort et al., 2020).	Ovarian reserve concerns with ovarian surgery; incomplete evidence on pain and live birth	Moderate for pregnancy; low/uncertain for pain/live birth
Hydrosalpinx surgery before IVF	Women with hydrosalpinx proceeding to IVF/ICSI	Clinical/ongoing pregnancy; live birth evidence variable	Salpingectomy probably increases clinical pregnancy	Surgical morbidity; possible effect on ovarian blood supply/reserve;	Moderate



			compared with no surgery, but live-birth data remain limited in some comparisons (Melo et al., 2020; Zhang et al., 2024).	anatomy-dependent choice	
Hysteroscopic polypectomy	Infertile women with an endometrial polyp	Pregnancy/IUI outcomes; live birth less certain	Removal is reasonable when a polyp is clinically relevant, but the 2024 guideline stresses that benefit should be demonstrated in meaningful fertility outcomes (Motan et al., 2024; Malhotra et al., 2024).	Perforation, bleeding, infection, adhesions; recurrence	Low–moderate
Hysteroscopic myomectomy	Women with cavity-distorting submucosal fibroids (FIGO 0–2)	Anatomical correction and pregnancy outcomes	Guidelines support treatment of selected cavity-distorting lesions; evidence is stronger for structural correction than for universal live-birth benefit (Motan et al., 2024; Malhotra et al., 2024).	Perforation, bleeding, fluid overload, adhesions	Moderate
Hysteroscopic adhesiolysis	Women with symptomatic/clinically significant intrauterine adhesions	Restoration of cavity; conception/pregnancy	Systematic review of 54 studies reported pooled pregnancy rate ~50.7%, but evidence was largely observational and obstetric risks remain (Guo et al., 2019).	Recurrence, perforation; abnormal placentation and other pregnancy complications	Low–moderate
Septum resection	Selected women with uterine septum and infertility/recurrent pregnancy loss	Pregnancy/live birth; miscarriage	Current guidance favors individualized selection rather than routine resection of every septum (Motan et al., 2024).	Perforation, adhesions, fluid overload; uncertain fertility benefit in some groups	Low / conditional
Combined laparoscopy + hysteroscopy	Women with both suspected pelvic and intrauterine pathology	Diagnosis plus treatment in one setting	May be efficient when both indications are independently present; not	Longer anesthesia/surgical exposure; cost; cumulative complications	Low–moderate



			justified solely for routine screening (Motan et al., 2024; Motan et al., 2023).		
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DIAGNOSTIC ROLE OF LAPAROSCOPY

The term 'the universal gold standard' for the evaluation of infertility should no longer be used for laparoscopy. It is still the gold standard direct examination for the evaluation of adnexal and peritoneal disease, but should not be routinely performed in cases of unexplained infertility (Motan et al., 2023; American Society for Reproductive Medicine, 2021). Factors that should be taken into account when making the decision include age, duration of infertility, symptoms, previous pelvic infection, previous pelvic surgery, suspected endometriosis, tubal testing, ovarian reserve, male factor, previous treatment, and the couple's preferred approach.

Endometriosis

Laparoscopy for the diagnosis and treatment of endometriosis offers benefits, however, whether the reproductive benefit is present depends on the disease phenotype and on patient selection. Randomized data have been obtained in women with minimal or mild endometriosis showing that some trials have led to increased fecundity after treatment, whereas other trials have demonstrated more variable results (Marcoux et al., 1997; Bosteels et al., 2010). Bafort et al. (2020) conducted a Cochrane review on laparoscopic treatment versus diagnostic laparoscopy alone and concluded that the former was likely to increase viable intrauterine pregnancy, but there was no evidence on live birth and the impact on pain was unclear. So, pregnancy versus live birth should be separated and pain outcome should be separated. Ovarian endometrioma surgical treatment should be performed with extreme care, since the removal of the cysts may decrease ovarian reserve. The minimally invasive surgery guideline from 2023 highlights the need to weigh potential fertility benefit versus risk of ovarian damage and states that laparoscopy is not always the first modality of choice for treating all endometriosis-associated infertility (Motan et al., 2023).

Pelvic adhesions and tubal disease

Pelvic adhesions and tubal disease are important causes of infertility. In some patients re-approximating the pelvic anatomy with adhesiolysis may be beneficial, but anatomical improvement is not necessarily linked to live birth improvement. Tubal surgery for reconstruction may be suggested in certain younger women who have good tubal anatomy and no significant other cause of infertility. When there is already hydrosalpinx prior to IVF, there is evidence that the surgical or occlusive treatment is beneficial in improving the outcomes of IVF (Melo et al., 2020; Zhang et al., 2024), but the optimal technique may vary based on the anatomy and ovarian reserve.

THERAPEUTIC LAPAROSCOPIC PROCEDURES

Laparoscopic myomectomy

The surgeon should perform a myomectomy on a case-by-case basis based on the size, location, distortion of the cavity, symptoms, age, length of time to infertility, and the future fertility treatment. The evidence is more compelling for treating submucosal or cavity-distorting fibroids than for removing all intramural and subserosal fibroids. Surgical approach to myomectomy should be based on surgical feasibility and fertility aspirations (Motan et al., 2023; Malhotra et al., 2024).

Endometriosis surgery

Surgery may be indicated in the following situations: pain, endometrioma, advanced disease, and when anatomy will be restored to improve fertility. It should not be touted as being better than IVF or medical

management in general. Patients should be informed that symptom relief, spontaneous pregnancy, IVF results, and live birth are distinct outcomes and may not achieve the same level of improvement (Motan et al., 2023; Bafort et al., 2020). In the context of IVF, salpingectomy has moderate quality of evidence for increased clinical pregnancy compared to no surgery, but the evidence is not as complete or strong for long-term fertility and live-birth (Melo et al., 2020). Proximal tubal occlusion has been compared to salpingectomy in recent studies, showing promising results in certain patients for IVF pregnancies, thus aiding in individualized surgical planning (Zhang et al., 2024).

DIAGNOSTIC AND THERAPEUTIC ROLE OF HYSTEROSCOPY

The most direct way to assess the uterine cavity is hysteroscopy but it should be preceded by an appropriate qualification: It is the gold standard for the direct visualization of intracavitary disease and not a standard evaluation of infertility in every patient. The 2024 Canadian guideline was based on evidence from PubMed/MEDLINE, Embase, ScienceDirect, Scopus, and the Cochrane Library and applied the GRADE methodology, and is focussed on the fact that hysteroscopic surgery may not always result in improvement of fertility outcomes and should be offered when there is a meaningful benefit to be achieved (Motan et al., 2024).

Endometrial polyps

Polypectomy resolves a physical cavity defect and, in some women, can enhance the chances for pregnancy, especially when undergoing IUI. The evidence, however, is not homogeneous and the manuscript should not suggest that all polyp removal leads to an increase in live births. In each study/recommendation, the appropriate endpoint should be explicitly stated (Motan et al., 2024; Malhotra et al., 2024).

Hysteroscopic myomectomy

For selected fibroids (e.g. FIGO types 0–2) that are distorting the cavity, hysteroscopy could be considered for resection. The advantages involve anatomical correction and alleviation of bleeding; the fertility advantage is most likely when the lesion is causing impaired implantation or miscarriage (Motan et al., 2024; Malhotra et al., 2024).

Uterine septum

A uterine septum can cause reproductive loss but the benefit of routine resection of a septum in all women who are not pregnant is not known. It is therefore recommended to provide personalized counselling instead of the current advice to see septoplasty as a universal fertility-enhancing procedure (Motan et al., 2024).

Intrauterine adhesions

Hysteroscopic adhesiolysis is the most popular direct surgical option for intrauterine adhesion. Guo et al. (2019) conducted a systematic review of 54 studies, including a total of 4,640 women, and reported a pregnancy rate of about 50.7% following treatment; however, there was significant heterogeneity among the underlying studies and most of these were non-randomized. Other risks of pregnancy following treatment are miscarriage, placenta accreta spectrum and pre-term complications, so restoration of the cavity does not imply a live birth.

FERTILITY OUTCOMES: WHAT SHOULD BE REPORTED?

A major methodological improvement in fertility-surgery literature is to separate outcomes that are often incorrectly treated as interchangeable. The following endpoints should be reported separately:

- Pain relief or symptom improvement: relevant particularly to endometriosis, but not a direct measure of fertility.



- Anatomical correction: restoration of tubal patency or uterine-cavity architecture; this is an intermediate outcome.
- Spontaneous conception: pregnancy achieved without ART after surgery.
- Clinical or ongoing pregnancy: pregnancy confirmed by ultrasound or continuing beyond a defined gestational point.
- IVF outcomes: implantation, clinical pregnancy, ongoing pregnancy, and cumulative outcomes per initiated cycle or patient.
- Live birth: the most clinically meaningful fertility endpoint and the preferred primary outcome when assessing whether a fertility intervention improves reproductive success.

Accordingly, statements such as “surgery improves fertility” should be replaced by more precise wording, for example, “surgery improves spontaneous pregnancy in selected women,” or “salpingectomy improves clinical pregnancy before IVF,” unless live-birth data are actually available.

COMBINED LAPAROSCOPY AND HYSTEROSCOPY

Performing both procedures during the same anesthetic may be reasonable when there are independent indications for both pelvic and intrauterine assessment. Potential advantages include a single anesthetic and coordinated treatment. However, combined surgery should not be used as a default screening strategy for unexplained infertility with normal imaging, because routine invasive evaluation has not been shown to consistently improve live birth (Motan et al., 2024; Motan et al., 2023).

CURRENT PRACTICE AND EVIDENCE GAPS IN BANGLADESH

In Bangladesh, minimally invasive reproductive surgery is becoming more common, especially in the tertiary hospitals, and specialized fertility clinics. The RCOG IRC Bangladesh guideline on hysteroscopy for 2025 focuses on diagnostic hysteroscopy, office hysteroscopy, indications, safety issues, documentation and adaptation of international guidelines for local practice (Orlando et al., 2021). This is an institutional / professional resource, not a national government guideline and should be used accordingly.

There are published Bangladeshi studies that confirm a local experience of laparoscopically diagnosing endometriosis in infertile women (Ahmed et al., 2026; Ahmed et al., 2025/26). There is no national registry of reproductive endoscopic procedures with standardized follow-up on live birth, complications, patient-reported pain, or cost, however, at present. So if a country claims to have reached a national level of adoption or improvements in outcomes without multicenter or registry data, it should be rejected.

In Bangladesh, multicenter prospective studies, standardizing surgical definitions, reporting of live birth and complications, transparent patient selection documentation and development of a national infertility registry would become priority areas. Measures would enable the comparison of surgery and IUI/IVF pathways and would enable identification of the value of the surgery pathway in the local health-system context.

CHALLENGES IN BANGLADESH

- Unequal access to reproductive endoscopy between major cities and peripheral areas.
- Limited numbers of surgeons with advanced reproductive-endoscopy training.
- High out-of-pocket expenditure and variable access to ART.
- Limited national data on infertility diagnoses, procedures, complications, pregnancy, and live birth.
- Need for standardized counseling so that patients understand when surgery is indicated and when IVF may be more appropriate.
- Need for structured training, audit, and referral pathways.



FUTURE DIRECTIONS

- Develop nationally coordinated infertility guidance integrating WHO recommendations with Bangladesh- specific feasibility and cost considerations.(World Health Organization, 2025)
- Expand structured reproductive-endoscopy training and competency-based assessment.
- Develop multicenter infertility and surgical-outcome registries.
- Use standardized fertility endpoints, with live birth and cumulative live birth prioritized over anatomical or biochemical surrogate outcomes.
- Integrate minimally invasive surgery with ART rather than treating surgery and IVF as competing approaches.
- Generate Bangladesh-specific evidence on cost, complications, patient-reported outcomes, and long-term reproductive outcomes.

CONCLUSION

Laparoscopic and hysteroscopic surgery are still relevant as part of the treatment for infertility: its effectiveness depends on the correct choice of patients. Laparoscopy should not be considered a routine gold-standard diagnostic test for all cases of infertility; it is best indicated when there are indications of pelvic disease and when a therapeutic procedure is to be performed (Motan et al., 2023; American Society for Reproductive Medicine, 2021). Hysteroscopy is the definitive direct method of intracavitary assessment and treatment, but routine hysteroscopy is not a consistently effective intervention to improve live birth (Motan et al., 2024; Yang et al., 2020).

There is good evidence to support indication-based treatment for specific conditions such as hydrosalpinx prior to IVF and clinically significant intrauterine pathology. The evidence supporting surgery for endometriosis is more complex and requires differentiation between pain, spontaneous pregnancy, IVF and live birth outcomes (Bafort et al., 2020; Melo et al., 2020). Available institutional evidence confirms in Bangladesh there is a significant burden of pelvic pathology in women who are infertile, but there is a lack of national outcome evidence (Ahmed et al., 2026; Ahmed et al., 2025/26). Future studies should thus shift from reporting on procedure availability to standardized and patient-centered outcomes in reproduction, including live birth, complications, cost and quality of life.

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