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Finis coronat opus? What comes after hysteroscopic metroplasty

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ABSTRACT

Hysteroscopic metroplasty is widely regarded as the endpoint of septate uterus care, yet its impact on fertility remains uncertain and the postoperative cavity is seldom reassessed. Evidence on second-look hysteroscopy is equally scarce: mostly retrospective, rarely randomised, and not designed to isolate its reproductive effect. Re-inspection should arguably be reframed as an integral, fertility-oriented step rather than optional surveillance. Routine use in all patients is unjustified and not cost-effective, yet systematic omission may also overlook clinically relevant abnormalities. A selective, risk-stratified strategy is preferable, reserving it for the highest-risk women and triaging the rest with three-dimensional sonohysterography. Prospective, second-look-controlled trials are needed.

Keywords: Hysteroscopy, septate uterus, intrauterine adhesions, infertility, female, pregnancy outcome, live birth

Introduction

The septate uterus remains the most common congenital uterine anomaly, resulting from incomplete resorption of the Müllerian ducts during embryogenesis.[1] Over the past decades, the advent of operative hysteroscopy has profoundly changed the surgical approach to uterine septum, making hysteroscopic metroplasty the most commonly adopted technique in clinical practice.[2-4] However, despite its widespread use, the benefit of hysteroscopic septum resection on reproductive outcomes remains a matter of debate.[5-7] This uncertainty has led several authors to question an anatomy-driven approach to septum management and to advocate instead for a more selective, outcome-oriented strategy focused on reproductive benefit rather than technical completeness alone.[8-10] Nevertheless, with reproductive outcome as the ultimate goal, the surgical act of septum resection has been extensively debated, whereas far less attention has been paid to what follows the procedure.[11] Hysteroscopic metroplasty should be viewed as a critical milestone rather than the endpoint of care.[12] Healing of the uterine cavity, completeness of resection, and the risk of postoperative intrauterine adhesions all represent variables that may significantly influence subsequent fertility, yet they often remain unverified.[13]

In this context, second-look hysteroscopy emerges as a potentially decisive but still underappreciated tool.[4] Its rationale is straightforward: to confirm adequate anatomical correction, identify residual septal tissue, and detect or treat early intrauterine adhesions before

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they become clinically relevant.[11] However, despite its intuitive appeal and increasing adoption in some centres, its role remains controversial, with marked heterogeneity in clinical practice and no shared international recommendations regarding its routine use, timing, or patient selection.[11,14] This lack of consensus mirrors the broader debate surrounding septum surgery itself, reinforcing the concept that postoperative hysteroscopy should not be regarded as a mandatory extension of surgery, but rather as a selectively applied tool within a personalized care pathway.[15]

Why Look Again: The Rationale for Second-Look Hysteroscopy

The rationale for re-inspecting the cavity rests on two findings that metroplasty may leave behind: a residual septum and newly formed intrauterine adhesions. Both are clinically silent and each can compromise implantation and pregnancy.[11,14]

The most comprehensive synthesis to date pooled 15 studies involving more than 1,400 women undergoing hysteroscopic metroplasty and subsequent second-look hysteroscopy, and its central message is that the postoperative cavity is far less predictable than the surgical literature implies. Clinically significant residual septa greater than 1 cm were identified in a small but non-negligible proportion of patients (2.6%), while intrauterine adhesions were reported with a strikingly variable incidence, ranging from minimal to substantial (1-35%), falling below 10% in series using anti-adhesion barriers.[11]

Such heterogeneity is unlikely to be coincidental. Rather, it probably reflects differences in surgical technique, operator experience, extent of septum resection, use of postoperative anti-adhesion strategies, and follow-up protocols adopted across centres.[11,14] Taken together, these findings point to a crucial but often underappreciated issue: hysteroscopic metroplasty should not be regarded as a single, standardised intervention, nor should its postoperative course be assumed to be uniform.[7] Within this broader variability, the surgical technique itself represents a key determinant.[16] In particular, a useful conceptual distinction has been drawn between septum section and septum resection. Septum section refers to the division of the septum along the midline with preservation of the surrounding myometrium, whereas septum resection involves actual tissue removal, potentially increasing endometrial trauma and the subsequent inflammatory response.[17] In this context, it would be of particular interest to explore whether and to what extent second-look hysteroscopic findings differ according to the surgical technique adopted, as this could further clarify the relationship between intraoperative tissue handling, postoperative healing patterns, and the need for follow-up intervention.[11] Furthermore, in some cases, small residual septa may represent intentional surgical conservatism aimed at avoiding uterine perforation or excessive myometrial damage, particularly in complete septa or anatomically complex uteri.[18] In others, they may reflect incomplete resection or suboptimal healing.[14]

Similarly, the wide range in reported adhesion rates (1-35%) across studies underscores how postoperative healing can differ substantially depending on tissue handling, energy source, and preventive measures.[11,19] Indeed, the use of adhesion-prevention strategies, particularly barrier methods, may reduce the incidence of clinically relevant pathology and, in selected cases, obviate the need for routine second-look hysteroscopy.[19,20]

When Looking Becomes Treating

Beyond diagnosis, the real value of second-look hysteroscopy lies in its therapeutic potential. Unlike imaging-based follow-up, hysteroscopy allows immediate intervention.[21] The opportunity to resect a residual septum or lyse early-stage adhesions during the same procedure may prevent progressive distortion of the uterine cavity and reduce the risk of long-term reproductive impairment.[12,14] This aspect is particularly relevant for women with a history of infertility, recurrent pregnancy loss, or those planning assisted reproductive treatments, for whom even subtle intrauterine abnormalities may have disproportionate clinical consequences.[11,12]

A complete septate uterus is the clearest example, and the profile most likely to benefit from second-look hysteroscopy (Figure 1). Indeed, such cases involve a longer septum, a more demanding resection and, especially when barrier methods are not used, a higher risk of postoperative sequelae. At second-look hysteroscopy two findings typically emerge: dense fibrous adhesions, or a residual septum, either of which may remain asymptomatic yet compromise reproductive outcomes if left uncorrected. The decisive advantage is that re-inspection allows them to be treated in the same sitting: looking again becomes, in practice, the act of treating (Figure 2).[11]

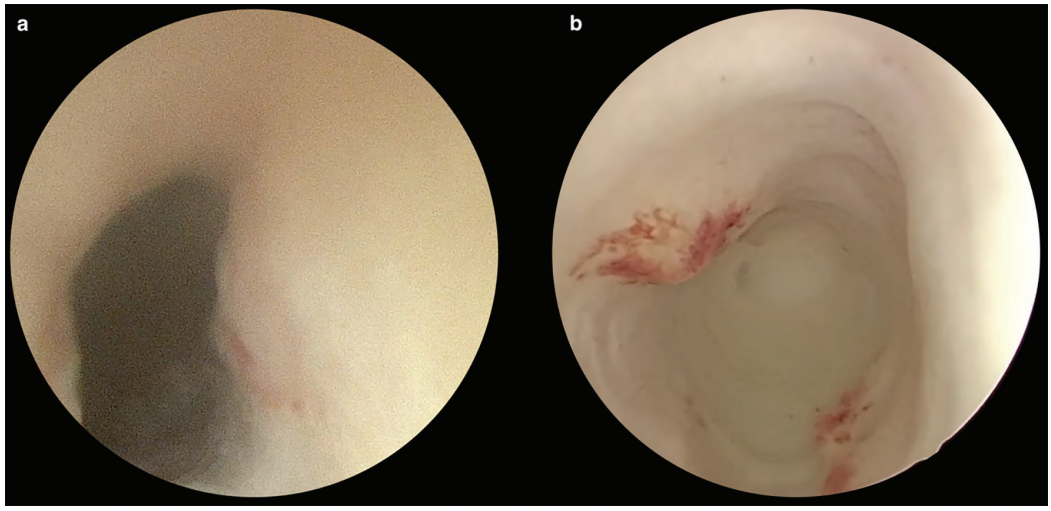

Figure 1. Diagnostic hysteroscopy in a 35-year-old woman with infertility and recurrent pregnancy loss, in whom a complete septate uterus is confirmed (U2bC1V0, according to the ESHRE–ESGE Classification System). (a) Hysteroscopic navigation of the right hemicervix. (b) Hysteroscopic navigation of the right uterine hemicavity showing the right tubal ostium.

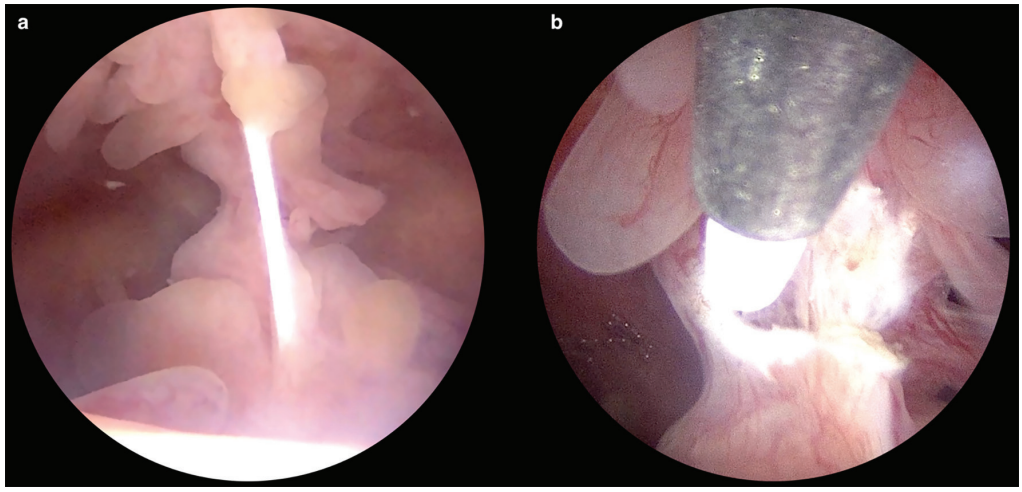

Figure 2. Second-look outpatient hysteroscopy performed 8 weeks after metroplasty (the same patient as in Figure 1). (a) Dense fibrous adhesions bridging the anterior and posterior uterine walls. (b) Careful adhesiolysis under direct vision with a 5-Fr bipolar electrode.

Should it Be Routine? The Case for Selective, Risk-Stratified Use

The question then arises: should second-look hysteroscopy become routine after hysteroscopic septum resection? On the basis of the current evidence, no unequivocal conclusion can be drawn.[11,12,21] Instead, it could be useful a selective and individualised approach, tailored to patient characteristics and intraoperative findings.[22] In our view the clinical challenge lies not only in establishing whether second-look hysteroscopy has value, but in identifying which patients are at high risk and most likely to derive meaningful benefit, and when.[12] Patients with complete septa, technically challenging resections, absence of anti-adhesion measures, or a poor reproductive history appear to be those most likely to benefit from systematic postoperative evaluation.[14] In these cases, outpatient hysteroscopy represents a low-risk, well-tolerated procedure that combines diagnostic precision with immediate therapeutic capability.[11]

In this context, adjunctive strategies may further refine patient selection and reduce unnecessary invasive procedures.[23] Among these, non-invasive imaging modalities, particularly three-dimensional sonohysterography (3D-SIS), have demonstrated high diagnostic concordance with hysteroscopy in the postoperative assessment of the uterine cavity.[16,24] In the studies by Saygili-Yilmaz et al.[25] and Casadio et al.,[16] second-look hysteroscopy was not routinely performed in all patients but was instead reserved for selected cases based on abnormal findings at hysterosalpingography or

3D-SIS, respectively. Notably, 3D-SIS has shown diagnostic accuracy, sensitivity, and specificity comparable to hysteroscopy, while being less invasive, better tolerated, and more cost-effective.[16,25] From this perspective, imaging-based triage may represent a pragmatic strategy to identify among "low-risk" patients, who could benefit from a second-look hysteroscopy (while sparing low-risk women who are unlikely to benefit from an unnecessary procedure) improving cost-effectiveness and patient comfort without compromising diagnostic reliability.[26] Overall, these findings highlight the need for a validated diagnostic pathway aimed at tailoring second-look hysteroscopy to individual patient risk profiles.[16,25]

Once the right candidates have been identified, one objection still remains: cost. Indeed, a further objection often raised against routine second-look hysteroscopy is its cost-effectiveness. This concern, however, has become less compelling now that the examination can be carried out in an outpatient setting without anaesthesia. In this form it requires no operating-theatre time and no further hospital admission, so the additional cost to the patient and to the health system is small.[27] The issue, therefore, is not whether the procedure is affordable, but for whom it is worth performing: if it is offered to every woman regardless of risk, the cumulative cost rises without a corresponding clinical gain, whereas if it is reserved for those in whom an abnormality is likely to be found, the same procedure becomes both clinically useful and economically reasonable.[27]

The Timing of the Second-Look Hysteroscopy

Timing remains another unresolved and clinically relevant issue, as it directly influences both the detection and management of postoperative intrauterine adhesions and the identification of residual septal tissue.[11,12,28] Most published series adopt an interval from 4 to 20 weeks.[11,12] Early second-look hysteroscopy may facilitate the management of filmy, newly formed adhesions that are easier to treat and less likely to recur. Proponents of this approach argue that early intervention may interrupt the cascade leading to more fibrotic and clinically significant adhesions.[12] On the other hand, later evaluations may better capture mature abnormalities with clearer anatomical and clinical implications, potentially avoiding overtreatment of transient or clinically insignificant findings.[11,21] At present, no single time point can be universally recommended, reinforcing the importance of individualised decision-making.[11]

Both extremes therefore prove unsatisfactory and since the literature defines no optimal interval, the balance of these opposing risks makes an intermediate window advisable. On this basis, assessment at around 6 to 8 weeks appears the most reasonable compromise, late enough for transient findings to resolve, yet early enough to lyse adhesions while they remain filmy and amenable.[3]

A Fertility-oriented Perspective

To our mind, the most important insight concerns the potential relevance of second-look hysteroscopy from a reproductive medicine perspective.[11] Infertility represents the clinical context in which hysteroscopy has progressively assumed a pivotal role, owing to its unique ability to directly assess and treat intrauterine factors that may impair implantation.[29,30] While the impact of hysteroscopic metroplasty on fertility outcomes has been extensively investigated over the years with conflicting and often controversial results,[5-7] virtually no studies have specifically addressed the contribution of second-look hysteroscopy to reproductive outcomes after septum resection.[11]

Crucially, most studies of fertility outcomes after metroplasty never reassessed the postoperative cavity, so residual septa or early adhesions may have persisted uncorrected in an unknown proportion of women; part of the conflicting fertility results may thus reflect this undocumented variability in the surgical result, not only patient selection and technique. Conversely, the few studies addressing the second look directly are largely retrospective, rarely randomised, and not designed to isolate its reproductive impact, so any benefit is inferred rather than demonstrated. This constitutes a source of bias, not merely a missing endpoint, resolvable only by prospective studies designed to test the reproductive role of the second look directly.[11,19]

In this regard, the systematic review by Vitale provides the first comprehensive overview of reproductive outcomes in women undergoing postoperative hysteroscopic assessment. Among the 637 women actively attempting to conceive, a pregnancy rate of 66.2% was reported, with a live birth rate of 56.2% and a pregnancy loss rate of 9.6%.[11] These figures are uncontrolled and cannot establish causation, but they point to a plausible, testable hypothesis: that detecting and correcting residual septa or early adhesions (which would otherwise pass unnoticed) may contribute to better reproductive outcomes.[11,12]

Conclusion

Second-look hysteroscopy should be neither routine nor abandoned, but targeted. We reserve it for the women who stand to gain most (those with a complete septum, a technically demanding or incomplete resection, no anti-adhesion prophylaxis, or an adverse reproductive history) and triage the rest with 3D-SIS, proceeding to hysteroscopy only when imaging is abnormal. We schedule it at around 6 to 8 weeks, early enough to lyse filmy adhesions yet late enough to avoid chasing findings that would resolve on their own, and perform it in the outpatient setting so that any residual septum or adhesion is corrected in the same sitting.

In the absence of well-designed prospective trials capable of clearly defining indications, optimal timing, and the true impact of second-look hysteroscopy on reproductive outcomes, clinical practice remains guided more by experience than by evidence. Until such data become available, the challenge is not merely deciding whether to perform a second-look hysteroscopy, but determining how to generate the evidence needed to guide clinicians toward a shared and reproducible direction in patient care.

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