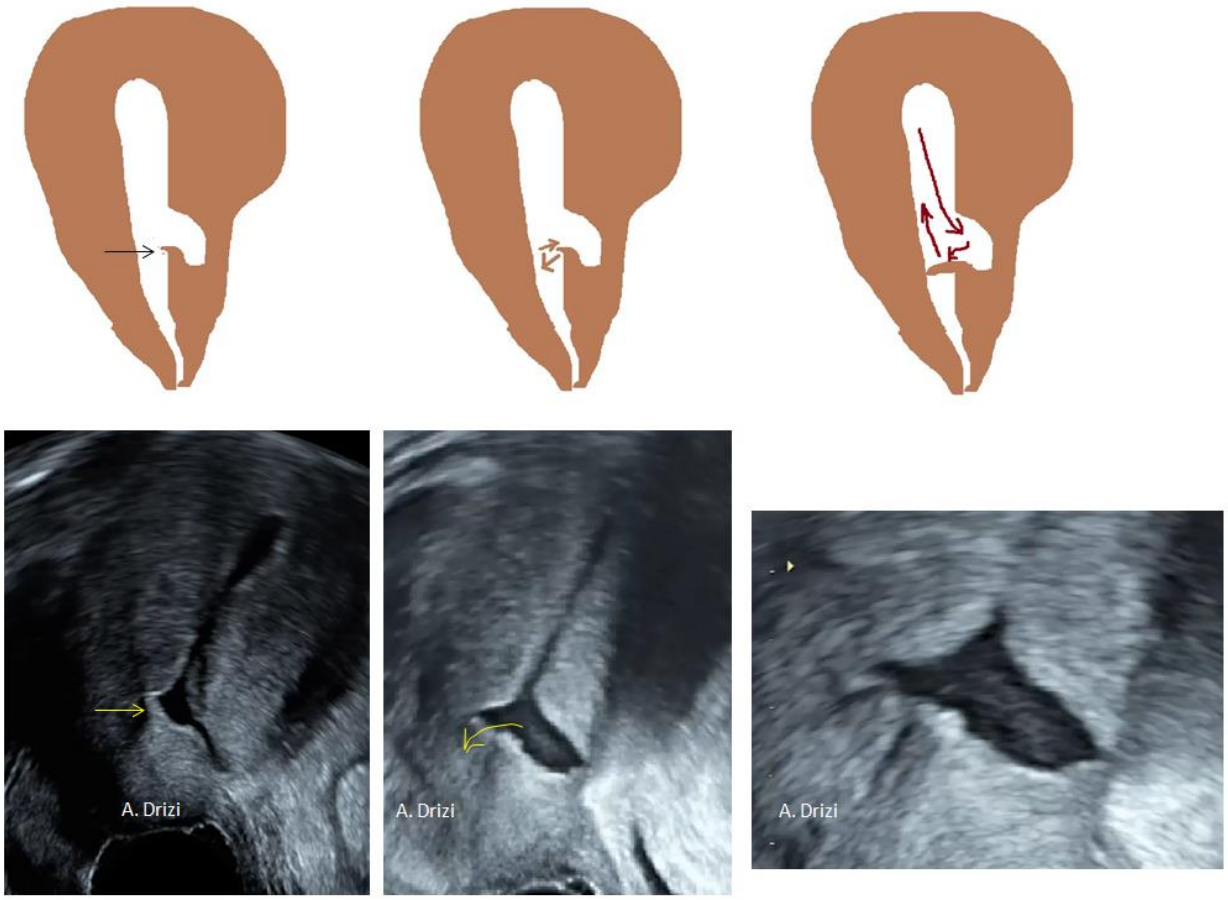

Figure 5. Demonstration of the valve mechanism by the distal edge and correlation with ultrasound at increasing magnification (black and yellow arrows). The flow of the blood closes the valve resulting in decreased evacuation of menses and causing more distention. Images by A. Drizi.

Isthmocele: rather a complex multifactorial entity.

Given the lack of standard consensus regarding classification and management of isthmocele, it is of utmost importance to remain careful to the various mechanisms in order to identify this or those involved in each patient, so as to thoughtfully target them whenever possible. Moreover, reporting the diagnostic details of the operated cases is the only warrant of more pertinent studies leading to a better understanding of the condition in its diverse facets as well as to more optimized treatment strategies depending on the variety's type. Consequently, a constant attention to details during diagnostic hysteroscopy is of high importance, as it can reveal additional anomalies which are difficult to judge at ultrasound such as angulations and twisted path of the cervico-isthmic canal (Fig 6).

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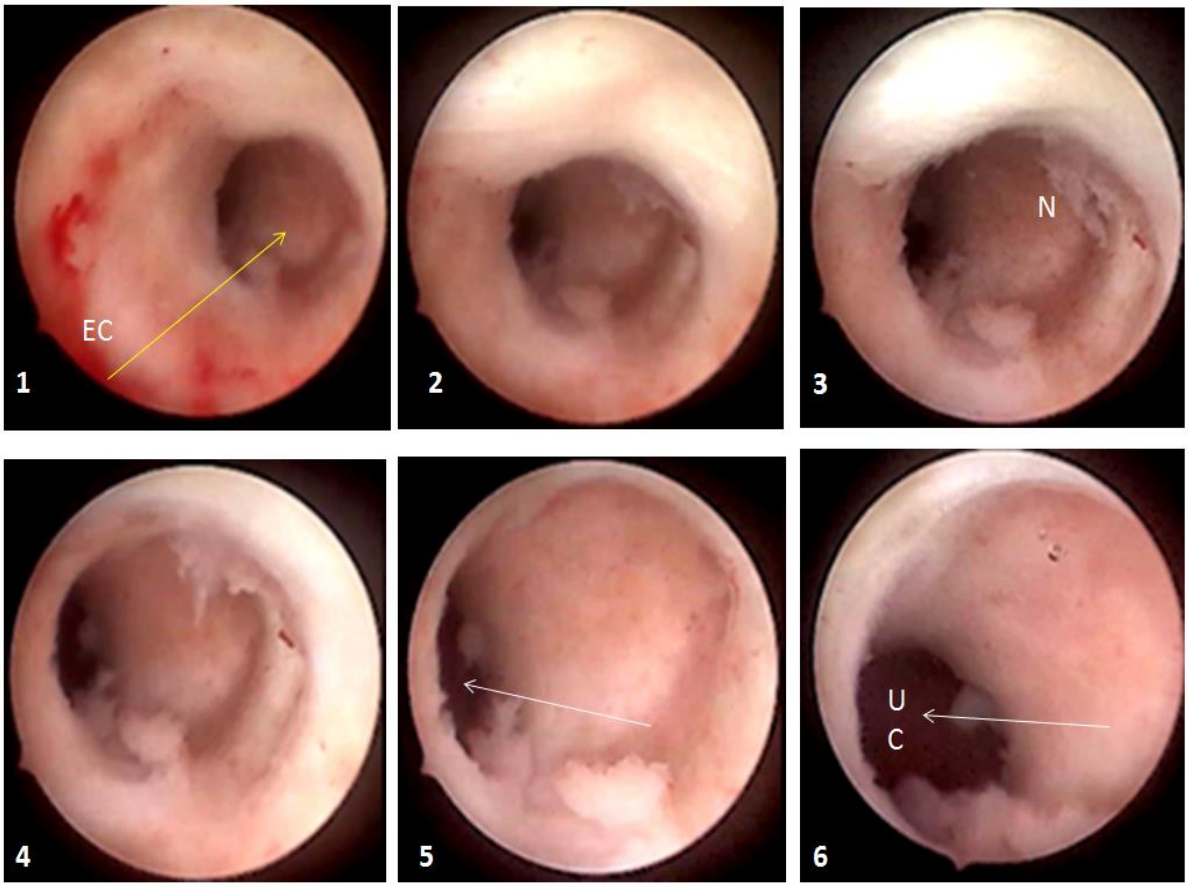

Figure 6. Lateral angulation at the level of the niche (N). 1-6: progression from the endocervical canal (EC) until the entry of the uterine cavity (UC). Yellow arrow: orientation of the canal from the right to the left of the patient; white arrow: orientation of the cavity from the left to the right of the patient, resulting in an angulation (images by A. Drizi).

In table 2, a diagram is proposed to summarize the different classes of isthmocele overviewed in this article, as well as the therapeutic approach likely to tackle the specific pathogenic mechanism in each one.

Conclusion

With the progress of imaging techniques, hysteroscopy does not need to be performed in the unique purpose of posing the diagnosis of a symptomatic isthmocele but rather as a mandatory first step within the same operative session.

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Pathogenic mechanisms of isthmocele	Specificities of the symptomatic defect	Proposed surgical adaptation in hysteroscopy.
Anatomical varieties	Simple triangular USD • RM greater or equals 2.5-3mm • RM < 2.5mm Complex shapes Complex USD with branches	Classic hysteroscopic treatment Laparoscopy, vaginal route Depending on the RM Laparoscopy++, vaginal route++ If RM > 3mm: hysteroscopic opening of the branches to be assessed?
Histo-pathological varieties	Vascular anomalies Inflammation Polyps Endometriosis Adenomyosis on the roof Myometrial changes.	Coagulations of all abnormal vessels Release of the distal edge to facilitate evacuation of blood + coagulation of all the inflammatory tissues Polypectomy Superiority of laparoscopic or vaginal resection of the entire wall. Coagulation (⇔cautery) Hysteroscopic resection of the hard fibrous tissue allows subsequent remodeling of the myometrium within the scar site.
Dynamic varieties	Distal edge acting as a valve-like system	Hysteroscopic resection of the distal edge (plus the usual hysteroscopic treatment).

Table 2. Summary of the different classes of isthmocele overviewed in this article, as well as the therapeutic approach likely to tackle the specific pathogenic mechanism in each case.

Despite the lack of understanding surrounding the isthmocele as an anatomo-clinical entity, it appears as a multifactorial condition where heterogeneous mechanisms can be impaired.

Its appears as one area where ultrasonography and diagnostic hysteroscopy are more advanced than operative hysteroscopy which, in all cases,

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can only be improved if taking into consideration the different varieties.

It is of utmost importance to define more pertinent classifications of the condition separating the simple classic forms from the complex ones as this could impact the choice for the optimal surgical treatment. Therefore, and in our practice of ultrasound and diagnostic hysteroscopy, we propose to classify isthmoceles in simple and complex ones. Complexity can be anatomical, histo-pathological and dynamic. This would provide a more accurate basis for the assessment of the surgical treatment.

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