The Journal of Obstetrics and Gynecology of India (November–December 2022) 72 (S2):S421–S424
https://doi.org/10.1007/s13224-021-01609-4

CASE REPORT

Role of Laparoscopic Transillumination Guidance During Hysteroscopic Metroplasty in Simplifying Surgical Management of Type II Robert's Uterus

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Received: 27 May 2021 / Accepted: 6 December 2021 / Published online: 14 April 2022
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Abstract
Robert's uterus is a rare variant of septate uterus with an asymmetrical septum which divides the uterine cavity into a noncommunicating hemiuterus causing hematometra and other communicating hemiuterus with a single cervix and a normal fundal contour (U2bC3V4 ESHRE classification). It is a cause of severe dysmenorrhea in young girls. However, there is a type of Robert uterus (Type II) which does not have collection in the blind cavity and causes symptoms later, similar to our case. We describe a case of hysteroscopic septum resection (metroplasty) with laparoscopic guidance by transillumination in a case of Type II Robert's uterus in a 25-year-old nulliparous woman. Thick muscular septum posed a surgical challenge which was supplemented by astutely utilizing laparoscopic transillumination.

Keywords Blind cavity · Endometriosis · Hematosalpinx · Mullerian anomaly · Noncommunicating horn · Obstructed horn · Pyometra · Retrograde menstruation · Severe dysmenorrhea

Introduction

Robert uterus is a rare variant of septate uterus with an asymmetrical septum dividing the whole uterine cavity in one noncommunicating blind obstructed hemiuterus and other communicating horn with a single cervix and a normal fundal contour. It was first described by Robert in 1970 [1]. Since then, few case reports are available reporting varied management options. They are classified by the old AFS classification in the category of septate uterus (Class V, American Society for Reproductive Medicine Classification). However, ESHRE classification has subcategorized it to U2bC3V4 with complete septate uterus but unilateral aplastic cervix [2]. It can be of three types based on the collection in the obstructed cavity: Type I is with large hematometra in the blind cavity, Type II with no collection in it and lastly Type III with a small collection [3].

A 25-year-old woman married for seven months presented to gynaecology OPD with foul smelling discharge per vaginum, severe dysmenorrhea, abnormal uterine bleeding and dyspareunia. Ultrasound revealed uterus didelphys with right cervical canal collection. She underwent dilatation and drainage. But due to persistent symptoms, she was referred to a higher centre where she underwent hysteroscopy by vaginoscopic approach which suggested a stenosed right cervix. Dilatation and drainage of pus collection was achieved. In turn, both the procedures failed to diagnose Robert's uterus. She was investigated multiple times with serial ultrasounds during this course which were consistent with uterine didelphys and a right cervical collection with single left kidney and an absent right kidney.

At our centre, we performed detailed MRI pelvis, which suggested bicorporeal septate uterus with septum

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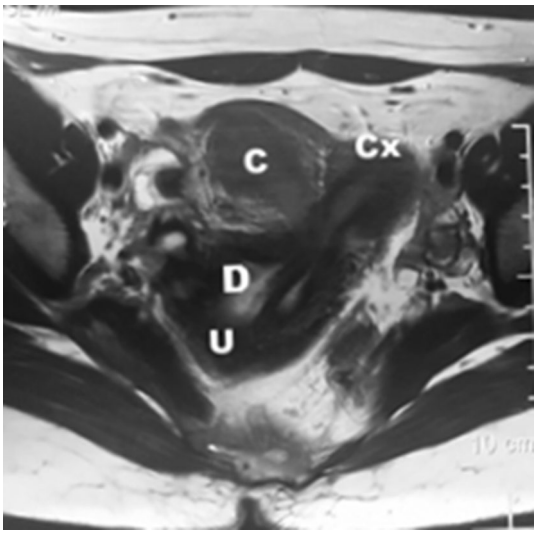

Fig. 1 Transverse section of T2W MRI pelvis suggestive of sacculation in right cervical region (marked as "C"), with left uterine cavity (uterus marked as "U") communicating normally with single cervical canal (marked as "Cx"). Right noncommunicating uterine cavity (marked as "D") shows no collection and communication

extending up to the internal os and a single cervix. T2 hyperintense contents were seen in the right side of the cervical canal suggestive of a blind sacculation. Right haematosalpinx and right endometriotic cyst were also seen. Left uterine cavity and cervical canal were normal (Fig. 1). She was planned for hysteroscopic septum resection under laparoscopic guidance with right endometriotic cystectomy. On laparoscopy, uterus was bulky with fundal indentation of 1 cm with obtuse angle of > 150° and a normal looking left uterine horn of 4 × 4 cm but slightly enlarged right horn with a bulge of 3 × 2 cm at level of cervix. Right ovary was buried in adhesions with normal fallopian tubes (Fig. 2A, B). Adhesiolysis was done to release right ovary from the ovarian fossa, and right endometriotic cystectomy was performed. At vaginal end, serial dilation of the right blind sacculation achieved drainage of 60 cc of frank pus. The cervical sacculation disappeared on laparoscopy after drainage of pus. Probable cause of sacculation was iatrogenic (previous dilatation and drainage of haematometra may have resulted in a blind tract in the cervical canal). Hysteroscopy (Karl Storz 4-mm telescope) in this blind sacculation did not reveal any ostia

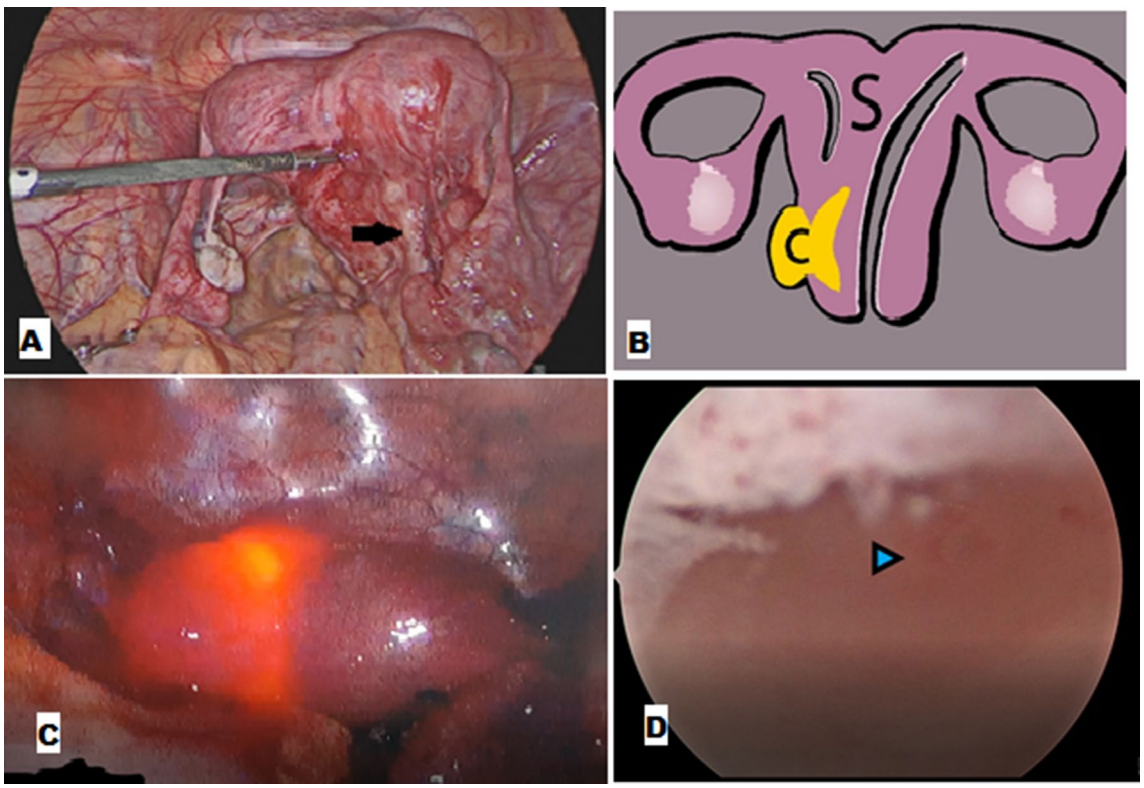

Fig. 2 Preoperative findings. **A** Preoperative picture showing both uterine horns with sacculation on the right side (marked with an arrow). There is 1-cm indentation in fundal contour with an obtuse angle (> 150°). Right ovary later showed an endometriotic cyst of 2 × 2 cm and flimsy adhesions in ovarian fossa. **B** Pictorial demonstration of the same (Robert's uterus with pus collection in blind sacculation in the area of right cervix (marked as "C") with a transverse asymmetric septum (marked as "S")). **C** Laparoscopic view showing transillumination in the left horn preoperatively as a guide for hysteroscopic metroplasty. **D** Hysteroscopy of the left cavity with a single ostia (arrowhead)

or endometrium, whereas left endometrial cavity with left ostia was demonstrable (Fig. 2D). As it was difficult to find a way to the right ostia (absence of bulge and thick muscular septum), assistance was sought by laparoscopic transillumination to guide hysteroscopic surgical steps. Under laparoscopic guidance, resectoscope with Collin's knife (Karl Storz) was inserted from the left cavity and thick muscular septum was identified (Fig. 3A) and resected gradually in multiple small strokes till right cavity was reached. Laparoscopic transillumination was utilized during the procedure to determine extent and end point of septal incision (Fig. 2C). No collection was drained from the right side making it a Type II Robert's uterus. However, the endometrium appeared to be functional, which could have resulted in right hematosalpinx and endometriosis. Type II Robert's uterus posed a technical challenge due to the sheer challenge of manipulating a thick septum without guidance in fear of a uterine perforation and going in wrong planes of dissection. This was avoided with the intuitive use of transillumination. Uniform transillumination of both cavities at fundus was achieved at the end of the procedure. Central notching at fundus also disappeared due to unification. Chromopertubation was attempted, but was interrupted due to extravasation of dye in the vessels. Intrauterine Foley's catheter inflated with 8 cc of saline was inserted into the unified cavity for a duration of one month. She had uneventful postoperative recovery. On her one-month follow-up visit, she was completely resolved of pain and her discharge disappeared. She conceived spontaneously and elective cerclage was done at 15-weeks of gestation.

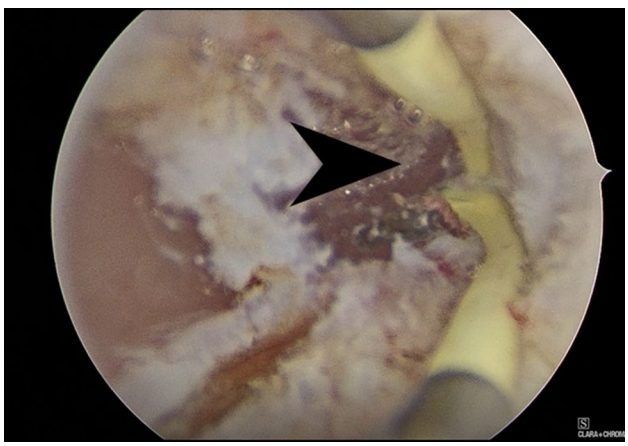

Fig. 3 Intraoperative pictures. Hysteroscopic view demonstrating a thick muscular septum with bleak small cavity of right side being unwrapped

Discussion

Due to its rare nature, the diagnosis is often missed preoperatively. Preoperative evaluation must include imaging for urinary system abnormalities and MRI pelvis for identifying the Mullerian anomaly. It can provide detailed tissue characterization with the location of septum and its asymmetry with associated hematosalpinx and endometriosis. Discordant to the typical presentation, our case had pus collection in a blind sacculation on the right side of atretic cervical canal possibly due to multiple attempts to reach right side of the cavity by dilatation presuming it to be a septate uterus. As there was no collection on the right side, our patient was classified as Type II Robert anomaly. Hence, she presented with foul smelling pus discharge from the vagina. Our patient presented very late as there was no collection in the blind cavity probably due to retrograde drainage of menstrual blood through the right fallopian tube into the peritoneal cavity causing endometriosis on the right side. To the best of our knowledge, ours is the only case report of Robert's uterus with pus collection in right cervical sacculation.

There is a paucity in the reported literature for management of such cases. Previously, they were managed via laparotomy and resection of blind horn or its endometrectomy or abdominal metroplasty. Due to growing advances in imaging techniques especially MRI, minimally invasive surgical approach has become the standard treatment. Hysteroscopic resection of septum with transillumination under laparoscopic guidance was of great assistance in precise cutting of septum and achieving proper unification. Ultrasound can also be combined with this approach to provide ultrasonic guidance in resection of septum. This particular approach was first used by Ludwin et al. [4] who validated the hysteroscopic metroplasty under transrectal ultrasonography without laparoscopy or laparotomy. Type I Robert uterus with collection in blind cavity is easier to manage endoscopically as the bulge of hematometra helps in guiding incision of septum; however, Type II Robert uterus is technically more difficult to operate due to absence of bulge and collection in the secluded unilateral cavity which we circumvented by transillumination. Robert's uterus can be diagnosed when there is a visible discordancy between the laparoscopic appearance of a normal fundal contour (convex, flat or a small indentation < 1 cm) with the hysteroscopic view of narrow single ostia cavity with a thick muscular septum. Fundal contour can differentiate rudimentary horn with unicornuate uterus from the Robert's uterus with the former having > 1 cm fundal cleft. In our case, laparoscopic transillumination was used to guide the extent and direction of hysteroscopic metroplasty.

Conclusion

Robert's uterus is a rare variant of septate uterus. Most of the patients undergo repeated surgeries due to misdiagnosis or inappropriate intervention. Gynaecologists should be aware of this kind of atypical Mullerian malformation and its management as it impacts the future obstetric performance of women. Preoperative diagnosis of Robert Type II on MRI helped in achieving surgical success due to accurate diagnosis. Hysteroscopic metroplasty guided by laparoscopic transillumination allows an accurate diagnosis and appropriate management, thereby decreasing surgical morbidity.

Funding None.

Declaration

Conflict of interest The authors declare that they have no conflict of interest.

Informed consent Informed consent was taken from the patient.

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