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Case Series

Exploring the complexities of cornual and interstitial pregnancies-insights from a case series

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ABSTRACT

Cornual and Interstitial pregnancies represent a rare but potentially life-threatening condition requiring prompt diagnosis and intervention. The current case series highlights the diversity of clinical presentations and management approaches. Each case highlights the importance of individualized care tailored to the patient's unique circumstances, including gestational age, hemodynamic stability, obstetric history, and anatomical considerations. Through these cases, we aim to unravel the intricacies of these ectopic pregnancy subtypes, highlight the importance of precise diagnostic criteria, and tailored management strategies for optimal patient outcomes. Additionally, we present a comprehensive review of existing literature to provide a nuanced understanding of these enigmatic clinical entities. The evaluation will extend to discussing various treatment strategies, highlighting both surgical and medical management.

Keywords: Cornual pregnancy, Interstitial pregnancy, Intervention, Gestational age, Hemodynamic stability, Obstetric history, Anatomical considerations

INTRODUCTION

Ectopic pregnancies, characterized by the implantation of a developing blastocyst outside the endometrial cavity, present clinicians with complex diagnostic and therapeutic challenges. Among the ectopic pregnancy subtypes, cornual and interstitial pregnancies stand out for their unique anatomical locations and distinct clinical implications.

These ectopic pregnancies are rare constituting 2-4% of ectopic pregnancies.[1] Despite their rarity, they pose significant risks, with a mortality rate ranging from 2 to 2.5%, contributing to approximately 20% of all ectopic pregnancy-related deaths. Therefore, the significance of early and accurate identification of these conditions cannot be overstated.[2] In this case series, we delve into seven compelling cases encompassing cornual and interstitial pregnancies.

Nomenclature-defining each pregnancy type

Interstitial and cornual ectopic pregnancies are often used interchangeably, yet they represent distinct clinical entities. Angular pregnancy is another entity which should be differentiated from ectopic pregnancy.

Cornual pregnancy

This rare form of ectopic pregnancy involves the implantation of the embryo at the junction of the fallopian tube and the uterus (cornual region). This term is often used in association with uterine anomalies like a bicornuate or septate uterus.[3,4]

Interstitial pregnancy

This condition refers to an ectopic pregnancy where the gestational sac is implanted within the interstitial, or the intramural segment of the fallopian tube, surrounded by the myometrium. The placement of gestational sac is within the muscular layer of the uterus, making it prone to severe complications.[3-6] The surrounding myometrium offers structural support to the expanding gestational sac and hence, interstitial tubal pregnancies tend to rupture at a later gestational age.[7] Because of this, the typical symptoms of ectopic pregnancy like pain and vaginal bleeding may not occur in interstitial pregnancies contributing to delay in diagnosis.

Angular pregnancy

Positioned within the uterine cavity but adjacent to the uterotubal junction, it implants medial to the round ligament, distinguishing it from other ectopic pregnancies.[8] Angular pregnancy is considered a viable intrauterine pregnancy unless complications arise and ESHRE has recommended that the term angular pregnancy has to be abandoned.[9] This entity can mimic symptoms of typical ectopic pregnancy, complicating diagnosis and management.

CASE SERIES

Case 1

A 28-year-old patient presented to us at 5 weeks of gestation for regular early pregnancy visit. On Ultrasound (USG), gestational sac with a small foetal pole was seen within the interstitial portion of the right fallopian tube which pointed towards interstitial ectopic (Figure 1). The patient was counselled regarding the same and Methotrexate injections was administered due to the patient's preference. Close monitoring of beta-hCG levels revealed a declining trend with successful resolution without surgical intervention.

Case 2

A 28-year-old primigravida at 6 weeks amenorrhoea with urine pregnancy test positive came for early pregnancy checkup. USG showed a small sac-like structure in the right cornual region (Figure 2). Despite early detection, methotrexate injections failed to reduce beta hCG levels. Subsequently, the patient underwent hysteroscopic removal of the cornual gestational sac (Figure 3), resulting in complete resolution postoperatively. Histopathological evaluation confirmed the diagnosis.

Case 3

The patient, a 30-year-old primigravida with IUI conception came for dating ultrasound. USG showed an early gestational sac in the left lateral wall of the endometrial cavity with a septate uterus indicative of a left cornual ectopic pregnancy (Figure 3). Management involved a series of methotrexate injections alternated with folinic acid injections.

However, during the treatment course, she experienced severe lower abdominal pain and bleeding, necessitating hysteroscopy for the removal of products of conception (Figure 3). The presence of a septate uterus added complexity to the procedure, requiring careful intraoperative navigation. Successful removal of the products of conception from the left cornua was achieved.

Case 4

A 20-year-old female with an obstetric score of P1L1A1, came with complaints of right sided abdominal pain and bleeding per vaginum. On USG, she was diagnosed to have a missed sac in the right horn of a bicornuate uterus (Fig 4). Initial medical management with methotrexate followed by mifepristone and misoprostol proved unsuccessful. Consequently, laparoscopic excision of the right horn along with the gestational sac was performed. The uterine defect was meticulously closed using barbed sutures (Figure 4).

Case 5

A 32-year-old female underwent embryo transfer in an IVF cycle. Serum beta hCG after 14 days of embryo transfer was 24 IU/ml and she was advised to repeat beta HCG after 48 hours. However, she did not attend subsequent visits. After 1 month, she presented with abdominal pain and bleeding P/V. USG revealed a complex cystic lesion in the right lateral wall of the uterus, suggestive of a right interstitial ectopic gestation (Figure 5).

The patient underwent laparoscopic resection of the interstitial ectopic. Intraoperatively, a 5 cm right cornual ectopic was identified. Complete excision of the ectopic pregnancy was achieved, followed by meticulous haemostasis and closure of the uterine defect using barbed sutures (Figure 5).

Case 6

A 26-year-old, with obstetric score of A1, was referred with an ultrasound showing a complex mass lesion in the left adnexa, suggesting a possible left adnexal ectopic gestation (Figure 6). She was planned for medical management with Methotrexate. Despite the medical management, there was no decrease in beta HCG levels and no reduction in the size of the lesion. Therefore, a laparoscopic excision of the mass lesion was performed. Intra-operatively, a 3×2 cm mass was found in the left cornua of the uterus (Figure 6), which was excised along with left tubectomy. Hemostasis was achieved and the uterus was sutured using V-Loc sutures (Figure 6). Histo-pathological Examination was consistent with ectopic pregnancy.

Case 7

A 30-year-old patient with a history of two previous caesarean sections presented after a failed attempted surgical evacuation of products of conception in view of unwanted pregnancy. She was diagnosed with a right interstitial ectopic pregnancy (Figure 7). Despite receiving methotrexate injections, there was no reduction in beta hCG levels. An initial hysteroscopy to locate the products of conception was unsuccessful as sac was not visualised in the cavity. The patient was advised to undergo laparoscopy, but she returned for treatment only after three weeks.

On examination, abdominal mass corresponded to 16 weeks gestational uterine size. USG showed an 8 cm gestational sac with placenta and absent foetal pole. Due to the advanced nature of the pregnancy, her obstetric history and the challenges posed by the failed hysteroscopy, she underwent laparotomy for excision of the interstitial pregnancy and concurrent right salpingectomy (Figure 7).

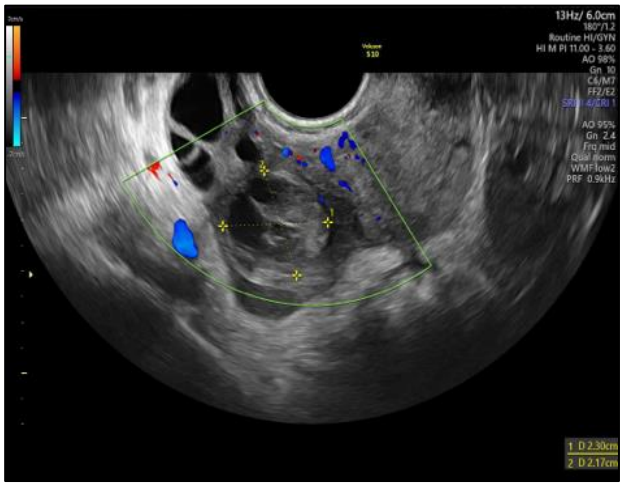

Figure 1: VS showing a gestational sac with fetal pole in Right interstitial part of the tube indicative of interstitial pregnancy.

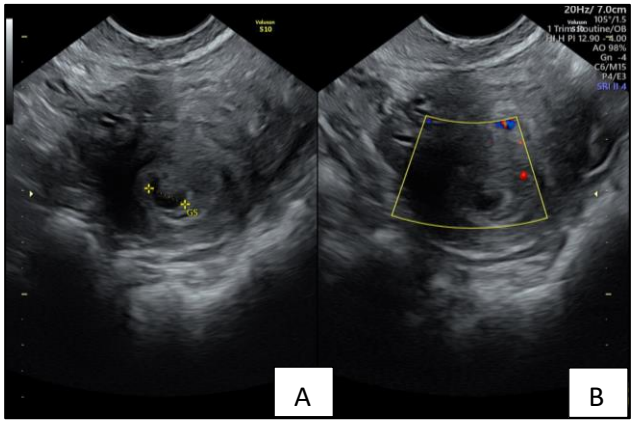

Figure 2 (A and B): TVS showing a gestational sac in right cornua of the fallopian tube.

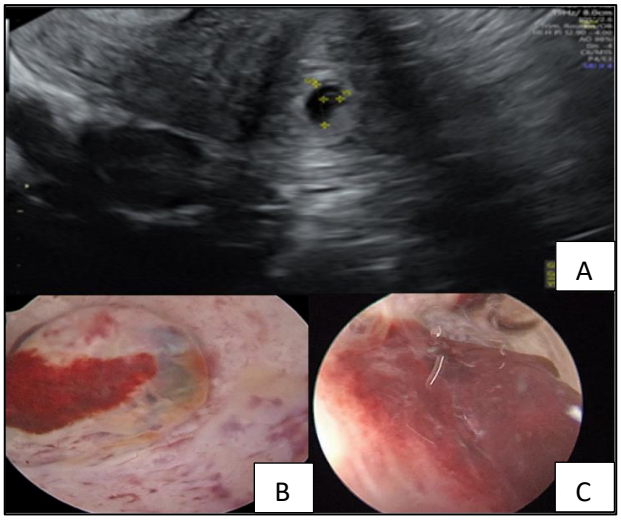

Figure 3 (A-C): USG and Hysteroscopy images showing a gestational sac in left cornua of the fallopian tube.

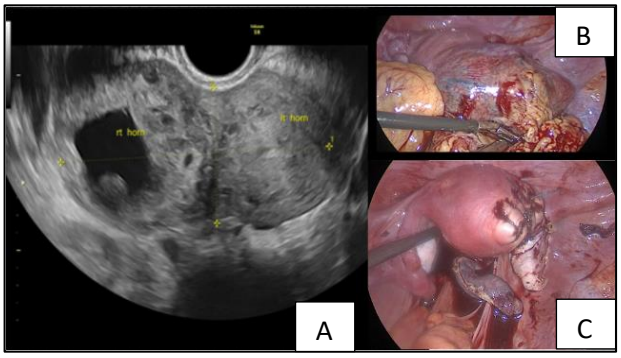

Figure 4 (A-C): USG of the missed gestational sac located in the right horn of bicornuate uterus and laparoscopic images showing bicornuate uterus with enlarged right horn and closure of the uterine defect.

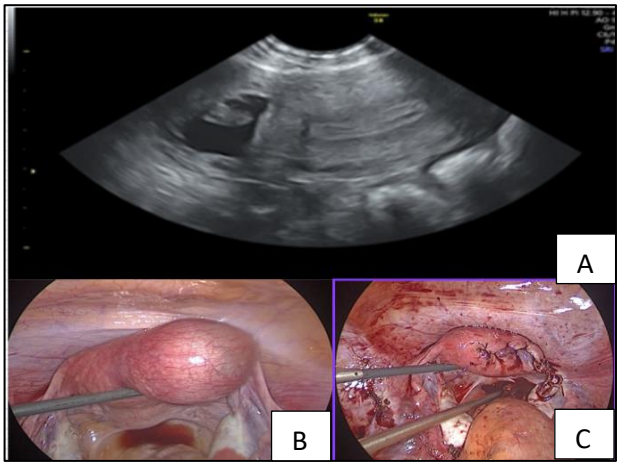

Figure 5 (A-C): USG image of a gestational sac in the right interstitial portion of fallopian tube with laparoscopic images of interstitial pregnancy and uterine closure after removing the products of conception.

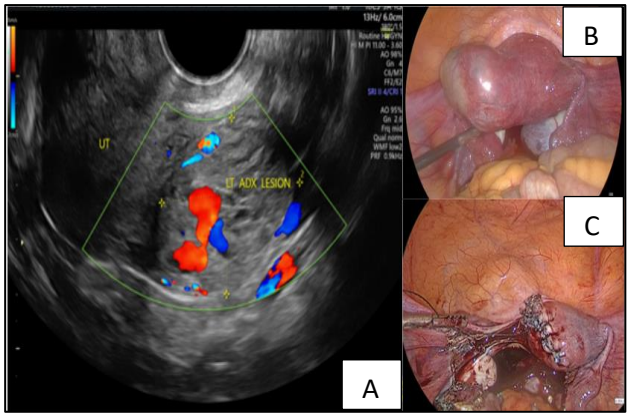

Figure 6 (A-C): TVS showing a complex mass lesion in left cornua with flow signals indicative of left cornual pregnancy. laparoscopic finding of left cornual pregnancy and successful removal of gestational sac and uterine closure.

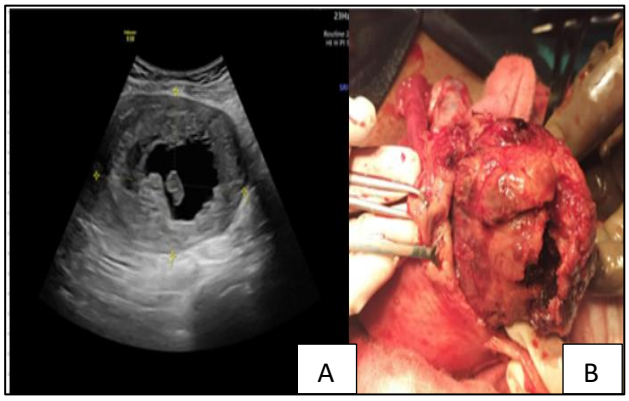

Figure 7 (A and B): USG showing right interstitial ectopic pregnancy and laparotomy picture showing advanced right interstitial ectopic gestation.

DISCUSSION

Clinical presentation variability

The seven cases had a broad spectrum of clinical presentations. There is a wide variation in the age at presentation and the obstetric score among the cases. While some patients exhibited classic symptoms of ectopic pregnancy, such as vaginal bleeding and abdominal pain, others were incidentally diagnosed during routine early pregnancy ultrasound assessments. Two cases involved patients with Mullerian anomalies, namely a septate uterus and a bicornuate uterus. Two patients conceived through ART (one IUI and one IVF).

Early detection of cornual and interstitial pregnancy is paramount to prevent serious complications such as uterine rupture and haemorrhage. Diagnostic modalities including transvaginal ultrasound and serial monitoring of beta-human chorionic gonadotropin (β-hCG) levels play a crucial role in confirming the diagnosis and guiding management decisions.

USG

Early detection in our centre was facilitated by the implementation of routine early pregnancy ultrasound evaluations. Trans vaginal ultrasound (TVS) remains the cornerstone of diagnosis, with characteristic findings including an eccentrically located gestational sac separate from the uterine cavity. Ackerman et al, introduced the concept of the "interstitial line sign" which involves the visualization of an echogenic line connecting the endometrial canal with the cornual region.[10] Additional diagnostic criteria include an empty canal with a chorionic sac located at least 1cm away from the lateral margin and enveloped by a thin layer of myometrium measuring 5 mm or less.[11]

3D USG

It provides detailed views of the cornual region of the uterus, enhancing the diagnosis of interstitial and cornual ectopic pregnancies by allowing better visualization of the eccentric location of gestational sac.[12,13]

MRI

MRI can differentiate various types of ectopic pregnancies and is particularly beneficial when ultrasound results are inconclusive. Interstitial or cornual ectopic pregnancy should be suspected when a gestational sac is located in the lateral aspect of the uterine fundus and is surrounded by less than 5 mm of myometrium. MRI findings often include an uninterrupted junctional zone separating the gestational sac from the endometrium.[14]

Exploring treatment options for ectopic pregnancies

Our case series illustrates the heterogeneity in treatment modalities employed for cornual and interstitial pregnancies. While medical management with methotrexate was utilized in some cases, surgical approaches including laparoscopy and laparotomy were necessary in others. The choice of treatment modality was individualized for each patient based on factors such as gestational age, hemodynamic stability, and the presence of concomitant uterine anomalies.

Medical management

Methotrexate (MTX), a folic acid antagonist that inhibits trophoblastic tissue growth, offers a non-invasive approach for selected patients. MTX has proven effective in treating ectopic pregnancies, particularly in patients with stable haemodynamic, low β-hCG levels, and no evidence of rupture and absent fetal heart.[15] A drop of more than 15% in β-hCG levels within four to seven days post-treatment is considered a marker of success. In cases where a second dose is required, the efficacy increases, indicating a cumulative effect of MTX.[16] Close monitoring for treatment response and potential complications such as ectopic rupture or persistent trophoblastic activity is

essential. Prior to MTX administration, blood investigations (Complete blood count, liver function test and renal function test) are crucial to ensure patient safety. MTX also helps in long-term reproductive outcomes as it is associated with higher rates of subsequent intrauterine pregnancies and lower incidences of recurrent ectopic pregnancies when compared to surgery.[16]

Local administration of drugs

Fetotoxic drugs, such as methotrexate (MTX) or potassium chloride (KCL), can be directly administered to the site of the ectopic pregnancy under transvaginal ultrasonographic (USG) guidance. This maximizes efficacy while minimizing systemic exposure reducing side effects and preserving fertility.[17]

Role of hysteroscopy

This minimally invasive approach allows for direct visualization and targeted removal of the gestational sac. It aids in preserving fertility and facilitating concurrent evaluation and treatment of intrauterine pathology. In cornual pregnancies, the introduction of hysteroscope into the cavity requires expertise since navigation through the cervix can pose difficulty in mullerian anomalies. In interstitial ectopic pregnancies, where the gestational sac is accessible via the cornual ostium, the removal of ectopic pregnancy can be done by hysteroscopic aspiration.[18]

Role of laparoscopy

Laparoscopy has become primary surgical option in ruptured ectopic pregnancy cases in recent years.[19] In cases of cornual and interstitial ectopics not amenable by medical management, laparoscopic approaches such as cornuostomy or cornual wedge resection offer minimally invasive options for excising the ectopic pregnancy while preserving fertility.[20,21]

Role of laparotomy

Laparotomy may be warranted for safe and effective removal of the ectopic pregnancy, as demonstrated in one of the cases presented. It is especially useful in cases with complex uterine anatomy, advanced cornual pregnancy or extensive peritoneal adhesions.

CONCLUSION

Through the detailed exploration of cornual and interstitial pregnancies, this article has highlighted the critical nature of early, accurate diagnosis and intervention which reduces morbidity and mortality. This case series offer insights on conservative versus surgical interventions, emphasizing the significance of tailored management strategies in enhancing patient outcomes.

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