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CASE REPORT

Simultaneous Natural Conception in a Rudimentary Horn and ICSI Pregnancy in a Unicornuate Uterus Managed by Fetocide with Successful Preterm Delivery: A Case Report

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Background: Simultaneous intrauterine and rudimentary horn pregnancies are exceedingly rare, particularly when one arises from assisted reproduction and the other naturally. Early diagnosis is essential to prevent life-threatening complications, such as rudimentary horn rupture. Careful ultrasound evaluation is critical to detect subtle congenital uterine anomalies that may otherwise go unrecognised.

Case Presentation: A 39-year-old woman with primary infertility and multiple intramural fibroids conceived naturally and via intracytoplasmic sperm injection (ICSI). Her 43-year-old husband had oligo-astheno-teratozoospermia. After myomectomy and counselling, she underwent donor oocyte ICSI with her husband's sperm; the second cycle resulted in conception. Four weeks later, a transvaginal ultrasound confirmed a viable intrauterine pregnancy. At seven weeks, a second gestational sac was noted in the rudimentary horn. Three-dimensional ultrasound confirmed a unicornuate uterus with a non-communicating rudimentary horn unconnected to the cervical canal or main cavity. At 12 weeks, ultrasound-guided fetocide was performed using 0.2 mL of potassium chloride. The intrauterine pregnancy progressed uneventfully, culminating in a cesarean delivery at 34 weeks of a healthy female neonate weighing 2.3 kg. Both mother and infant remained well at the six-week follow-up.

Conclusion: This case illustrates the rare coexistence of a natural rudimentary horn pregnancy and an ICSI-conceived intrauterine pregnancy in a unicornuate uterus. It highlights the importance of detailed, high-resolution imaging, vigilant antenatal surveillance, and timely multidisciplinary management to ensure favourable maternal and fetal outcomes.

Keywords: unicornuate uterus, rudimentary horn pregnancy, ICSI, fetocide, assisted reproduction, twin gestation anomaly

Introduction

The unicornuate uterus is a relatively rare congenital anomaly, present in about 1 in 500 women and accounting for 4–10% of all major uterine malformations.[1] It develops when one of the Müllerian ducts fails partially or completely.[2] It is more commonly seen in women facing infertility or recurrent miscarriage. Although associated with infertility and miscarriage, its effect on pregnancy outcome remains uncertain, largely because it has historically been diagnosed mainly in cases of rudimentary horn pregnancy.[3] Early studies were often limited, relying on small numbers of women diagnosed during surgery or hysterosalpingography, which may have introduced bias.[4] Today, high-resolution 2D transvaginal ultrasound allows non-invasive detection by identifying a single interstitial tube. In contrast, 3D ultrasound offers even clearer visualisation and more accurate assessment of Müllerian anomalies.[5]

Pregnancy in a rudimentary horn (RHP) is exceedingly rare, estimated to occur in 1 in 76,000 to 1 in 160,000 pregnancies, with 75–83% occurring in non-communicating horns.[6] Remarkably, conception is possible despite no connection to the cervix. One proposed mechanism involves retrograde sperm migration from the unicornuate uterus,

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through the fallopian tube and peritoneal cavity, reaching the rudimentary horn, which is estimated to occur in up to 51% of cases.[7] Another, suggested by Latto and Norman in 1950, involves microscopic channels connecting the unicornuate cavity to the horn, allowing sperm to fertilise an ovum directly.[8] In a review of 588 RHPs by Nahum, only 13% were diagnosed in the first trimester, 67% in the second, and 20% in the third.[9] Although rupture occurs in up to 50% of cases, the current maternal mortality is less than 0.5%.[10] Sonographic diagnosis relies on features such as an asymmetrical "pseudobicornuate" pattern, absence of continuity between the gestational sac and cervical canal, and surrounding myometrial tissue.[11]

This case report describes an exceptionally rare and clinically significant phenomenon in reproductive medicine. Even more extraordinary is the simultaneous occurrence of a natural conception in a rudimentary horn alongside an ICSI-conceived intrauterine pregnancy—a phenomenon reported only in a handful of cases worldwide. These pregnancies present unique diagnostic and management challenges, as the rudimentary horn gestation can easily be overlooked in the presence of a normal intrauterine pregnancy. Here, we report a rare case of such simultaneous conceptions in a woman with primary infertility, successfully managed through ultrasound-guided fetocide of the rudimentary horn pregnancy, allowing the intrauterine pregnancy to progress safely to preterm delivery. Our findings underscore the importance of meticulous early ultrasonographic evaluation in assisted reproductive conceptions, as timely diagnosis and targeted intervention can be lifesaving for both the mother and the intrauterine fetus.

Case Presentation

A 39-year-old woman presented to the fertility unit of 21st Century Hospital, Department of Obstetrics and Gynaecology, with a history of primary infertility. Her 43-year-old husband was evaluated for male factor infertility. The couple had been trying to conceive for several years without success. The patient reported regular menstrual cycles and no abnormal bleeding or pelvic pressure. Pelvic ultrasound revealed multiple intramural fibroids on the anterior and posterior uterine walls, the largest measuring 6×5 × 6 cm. Routine laboratory investigations, including complete blood count and thyroid function tests, were within normal limits. Her hormonal profile showed normal FSH, LH, estrogen, and prolactin levels, but a markedly low anti-Müllerian hormone (AMH) of 0.1 ng/mL. Screening for lupus anticoagulant, HBsAg, VDRL, and HIV was negative, and her random blood sugar was 6 mmol/L.

Her husband's semen analysis revealed a volume of 3.5 mL, total sperm concentration of 1×10^6/mL, total motility of 10%, progressive motility of 5%, and 2% normal morphology, consistent with oligo-astheno-teratozoospermia (OATS). Hormonal evaluation and scrotal ultrasound were normal. He received antioxidant therapy following an andrology consultation. The patient underwent diagnostic hysteroscopy and laparoscopy to evaluate uterine anatomy and tubal patency. The procedures confirmed patent tubes, a normal endometrial cavity, cervix, and ovaries. Five intramural fibroids were removed three anterior and two posterior, Figures 1A–D and 2A–D, as shown in the figure artwork.

The uterocervical length measured 3 cm, and recovery was uneventful. Three months post-surgery, she opted for assisted reproduction. Due to her extremely low AMH, donor oocyte ICSI using her husband's sperm was advised. The first cycle was unsuccessful. In the second cycle, serum β-hCG two weeks post-transfer was positive. A four-week ultrasound confirmed a gestational sac with a fetal pole and yolk sac within the uterine cavity. At seven weeks, follow-up ultrasound revealed a surprising finding: two gestational sacs, one within the right-sided unicornuate uterine cavity (ICSI pregnancy) and another in the left-sided rudimentary horn (natural conception). Initially, this was misinterpreted as a multiple pregnancy within a single uterus, as shown in Figure 3A–D

A 3D ultrasound later confirmed a non-communicating rudimentary horn with no connection to the cervix or main uterine cavity, establishing the diagnosis post-conception, as shown in Figure 4. At nine weeks, the patient experienced two episodes of vaginal spotting, managed as a threatened abortion with hospitalisation, bed rest, antibiotics, analgesics, and continued luteal support. She was counselled extensively on the risk of rudimentary horn rupture, and a plan was made for fetocidal management.

At twelve weeks, following normal double marker screening, ultrasound-guided fetocide was performed. Using a 22-gauge spinal needle, 0.2 mL of potassium chloride was injected into the thoracic cavity of the rudimentary horn fetus under local anaesthesia until cardiac activity ceased. The procedure was well tolerated, followed by prophylactic antibiotics, 48 hours of bed rest, and continuation of luteal support. Subsequent antenatal care was uneventful. The 20-

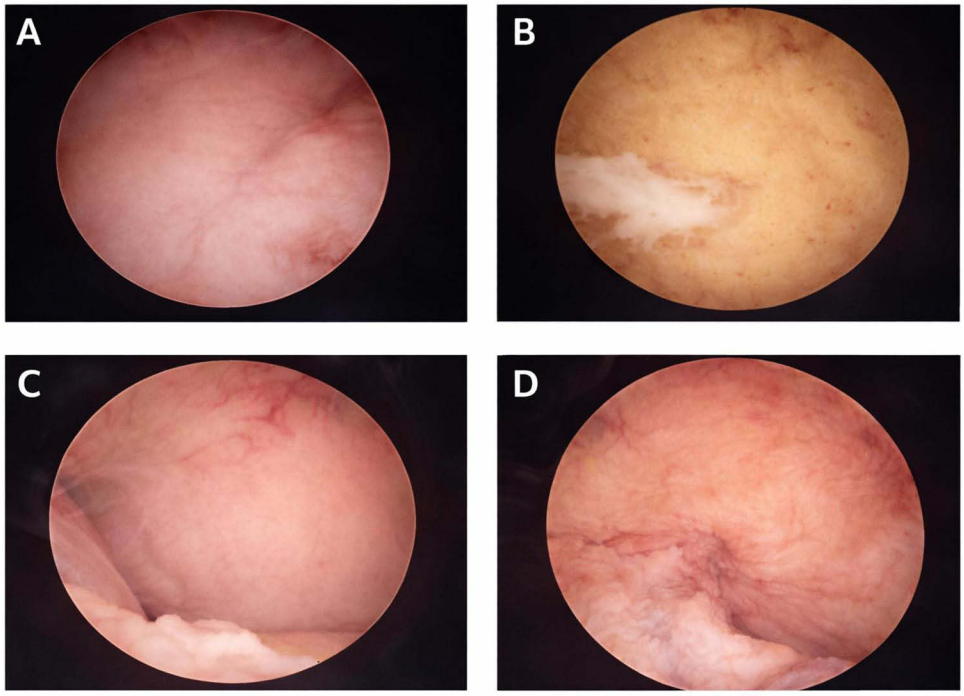

Figure 1 (**A-D**) Pre-conception hysteroscopy.

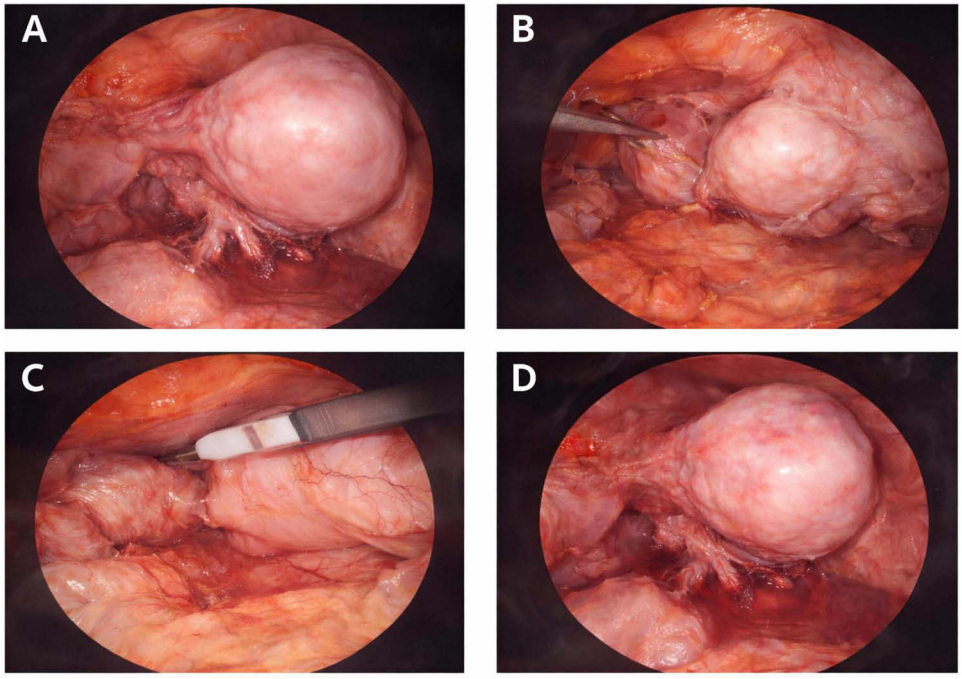

Figure 2 (**A-D**) Laparoscopic myomectomy.

week anomaly scan revealed normal fetal development, and quadruple screening was within normal limits. Serial ultrasounds demonstrated appropriate growth and normal amniotic fluid. At 28 weeks, she received two doses of intramuscular betamethasone for fetal lung maturity. At 34 weeks, spontaneous labor ensued, prompting an emergency lower-segment cesarean section. The intraoperative appearance of the uterus is shown in Figure 5. A live female neonate weighing 2.3 kg was delivered with Apgar scores of 6 and 7 at one and five minutes, respectively. The neonate spent

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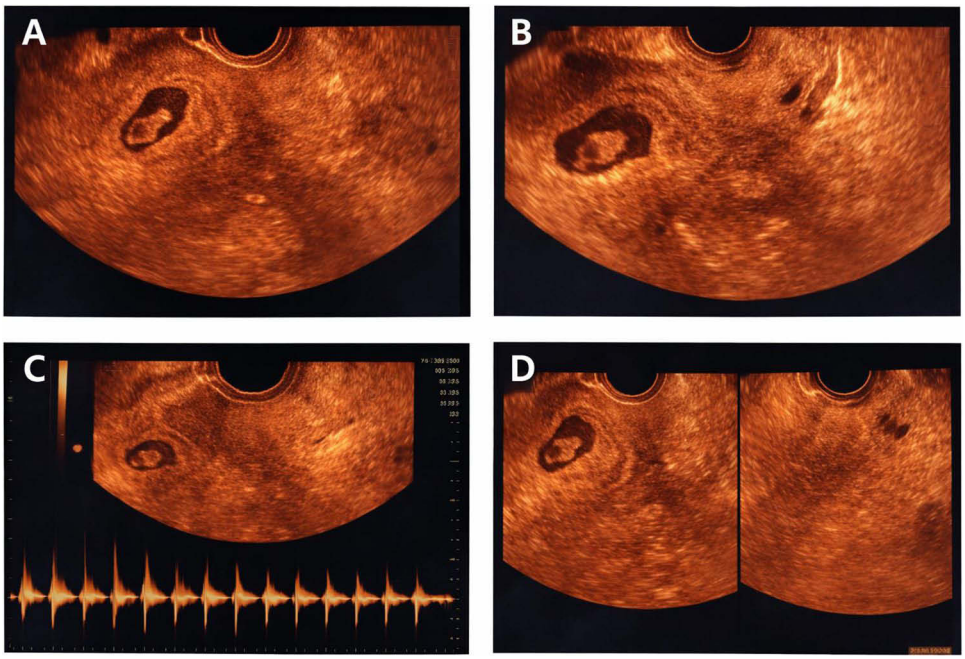

Figure 3 (**A-D**) Ultrasound showing simultaneous gestations.

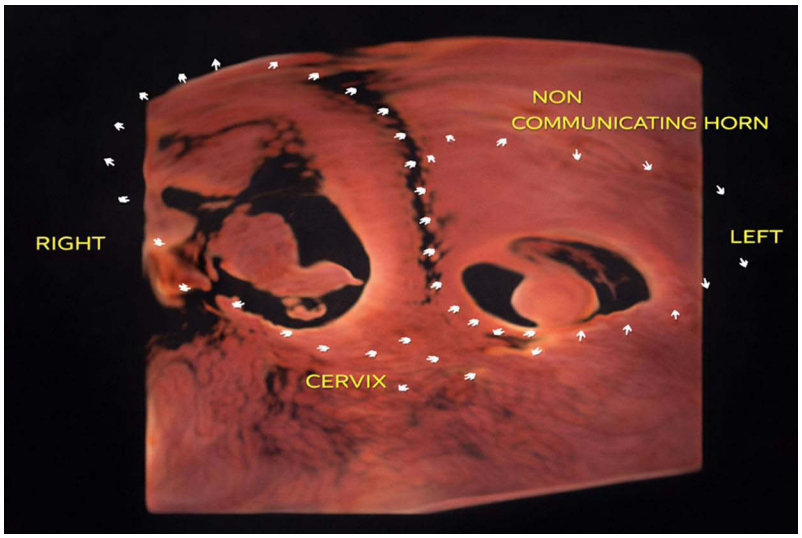

Figure 4 Three-dimensional transvaginal ultrasound image showing a unicornuate uterus with a non-communicating horn. White arrows delineate the myometrial outline of the uterus and highlight the margins of the non-communicating horn. The cervix is labelled inferiorly, with right and left orientation indicated.

three days in the NICU and was discharged in good health. The mother's postoperative recovery was uneventful, and at the six-week follow-up, both mother and infant were doing well. No postoperative complications or long-term sequelae were noted at that time.

This case represents an exceptionally rare occurrence of simultaneous natural conception in a rudimentary horn alongside an ICSI-conceived intrauterine pregnancy. It highlights the importance of meticulous imaging, vigilance in patients with Müllerian anomalies, and timely intervention. Early diagnosis and ultrasound-guided fetocide prevented catastrophic complications, allowing a favorable outcome for the intrauterine pregnancy. This case demonstrates that, with multidisciplinary coordination, complex reproductive scenarios involving congenital uterine anomalies and assisted

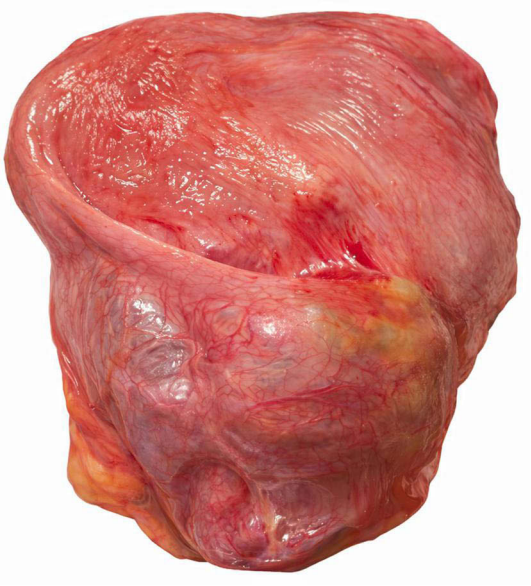

Figure 5 Intraoperative view showing a unicornuate uterus with a bulky non-communicating horn.

reproductive technology can achieve successful outcomes. As shown in Table 1, the detailed timeline of clinical presentation, investigations, management, and outcomes is summarized.

Discussion

Uterine anomalies arise from incomplete fusion of the Müllerian ducts during embryogenesis and are estimated to occur in approximately 4.3% of the general population. Among these, a unicornuate uterus with a rudimentary horn is the rarest form, resulting from the failure of one Müllerian duct to develop fully and incomplete fusion with the contralateral side.[12] The American Society for Reproductive Medicine (ASRM) classifies unicornuate uteri based on the presence and type of rudimentary horn. Class IIa describes a communicating rudimentary horn, Class IIb a noncommunicating horn with a cavity, Class IIc a unicornuate uterus without a rudimentary horn, and Class IId a noncavitated rudimentary horn.[13] In our patient, a noncommunicating rudimentary horn with a functional endometrial cavity was identified, corresponding to Class IIb.

Table 1 Timeline of Clinical Events

Date/Gestational Age (Weeks)	Event/Intervention
Pre-conception	Diagnostic laparoscopy and hysteroscopy – multiple intramural fibroids removed
0 weeks	Donor oocyte ICSI (second cycle)
4 weeks	TVUS: viable intrauterine pregnancy (ICSI conception)
7 weeks	TVUS: second sac in rudimentary horn (natural conception)
9 weeks	Vaginal spotting – managed as a threatened abortion.
12 weeks	Ultrasound-guided fetocide with 0.2 mL KCl (22 G needle)
20 weeks	Anomaly scan normal
28 weeks	Two doses of betamethasone IM were given.
34 weeks	Emergency LSCS – live female baby, 2.3 kg
6 weeks postpartum	Mother and infant are well on follow-up.

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This case is exceptionally rare, particularly in the context of fertility treatment and natural conception after years of infertility. The patient had consulted multiple fertility centres and, due to very low AMH, had been advised to consider donor oocytes. Her husband also had poor sperm motility, with only 10% progressive motility. Remarkably, she conceived naturally in the same month as undergoing ICSI. The natural conception occurred within the non-communicating rudimentary horn, a phenomenon scarcely reported. Only one similar case has been documented in India.[14], where delayed diagnosis led to rudimentary horn rupture in the early second trimester, requiring laparotomy, yet the intrauterine fetus was successfully delivered at preterm. Two mechanisms may explain fertilisation in a non-communicating rudimentary horn: transperitoneal migration of sperm from the functioning horn's fallopian tube, or microscopic channels connecting the unicornuate uterus and the rudimentary horn.[7,8] In our patient, the latter is the more likely explanation, considering her husband's low sperm motility and count.

Misdiagnosis of uterine anomalies is common, often due to limited access to advanced imaging or the wide anatomical variations seen in Müllerian anomalies. While transvaginal ultrasound is the standard for uterine assessment, its sensitivity for detecting rudimentary horns is limited. Advanced imaging, such as MRI or 3D ultrasound, improves detection.[15] In this case, early diagnosis at seven weeks allowed timely intervention and prevented catastrophic complications. A multidisciplinary approach contributed to a favorable maternal and fetal outcome. Management of rudimentary horn pregnancies is individualized. Options include medical treatments methotrexate, leucovorin, or potassium chloride (KCl) injection or surgical excision via laparotomy, laparoscopy, or robotic approaches.[16] In heterotopic pregnancies like ours, systemic medical therapy is contraindicated due to the risk to the intrauterine fetus. Therefore, targeted ultrasound-guided KCl injection into the rudimentary horn fetus was performed successfully, preserving the ICSI-conceived intrauterine pregnancy.

Strengths and Limitations

The strength of this case is the early 3D ultrasonographic diagnosis and detailed antenatal follow-up that enabled targeted fetocide and preservation of the intrauterine pregnancy. The main limitation is that it represents a single case, and MRI confirmation was not performed pre-conception; hence, generalizability is limited.

Conclusion

Pregnancies in a non-communicating rudimentary horn are exceptionally rare and present considerable diagnostic and management challenges. Early recognition demands a high index of suspicion, careful clinical evaluation, and the use of advanced imaging modalities. Management must be individualized, taking into account the patient's unique anatomy, reproductive goals, and clinical presentation. With timely intervention and a tailored approach, life-threatening complications can be avoided, allowing for safe continuation of viable pregnancies and optimal maternal and fetal outcomes.

Patient Perspective

When I found out I was carrying two pregnancies, I was very anxious about my own health and my baby's well-being. After the doctors explained the risks and treatment plan, I felt reassured and thankful that everything turned out safely. I'm glad to share my experience so others can learn from it.

Ethics Approval

Ethical approval for the conduct and publication of this case report was granted by Nadkarni's Research Ethics Committee (NREC/2025/004). This manuscript was prepared in accordance with the CARE (CAse REport) guidelines (www.care-statement.org).

Informed Consent

Written informed consent was obtained from the patient and her husband for publication of this case report and accompanying images. A copy of the written consent is available for review by the journal.

Acknowledgment

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors declare no conflicts of interest related to this study.

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