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CASE REPORT PEER REVIEWED | OPEN ACCESS

Inguinal hernia containing the ovary and fallopian tube with torsion in a three-month-old infant: A rare case of salvaged adnexa

Jamila Omar Abdalla, Atif Osman Awadelkreem, Chiman Lal Thakral

ABSTRACT

Introduction: Inguinal hernia in female infants is uncommon, and the presence of the ovary or fallopian tube inside the hernia sac is even rarer. When torsion occurs, it becomes a true surgical emergency. Ultrasound, especially with color Doppler, plays a major role in identifying the herniated adnexa and detecting loss of blood flow at an early stage. Recognizing this condition quickly is essential to avoid irreversible damage and to preserve ovarian function.

Case Report: A three-month-old baby girl was brought to the emergency department with a tender, non-reducible swelling in the left groin and a one-day history of vomiting. Ultrasound demonstrated an enlarged ovary located within the inguinal canal, showing peripheral follicles and absent Doppler flow, features consistent with ovarian torsion. Surgery confirmed torsion of both the ovary and the fallopian tube inside the hernia sac. Detorsion and hernia repair were performed, and follow-up ultrasound later confirmed complete recovery of the ovary.

Conclusion: This case shows how important early ultrasound evaluation is in detecting adnexal herniation and torsion in infants. Quick diagnosis and prompt surgical detorsion can save the ovary and fallopian tube, even in very young patients.

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INTRODUCTION

The canal of Nuck is the female equivalent of the processus vaginalis and normally obliterates after birth; persistence may allow herniation of pelvic structures such as the ovary into the inguinal canal [1].

Indirect inguinal hernia is one of the most frequent surgical conditions in infants, yet it occurs much more commonly in boys than in girls. In female infants, a patent canal of Nuck a developmental remnant of the processus vaginalis may persist and permit abdominal or pelvic structures such as the ovary or fallopian tube to herniate through the inguinal canal [2]. Although most hernias contain bowel or omentum, ovarian herniation represents a small but clinically important subset that requires urgent attention. Ovarian herniation has been reported in approximately 15–20% of female infant hernias, but torsion of the herniated adnexa remains exceptionally rare. When torsion develops, it can rapidly compromise the blood supply, resulting in ischemia and possible loss of the ovary [3].

Recent literature highlights the value of ultrasound particularly with color Doppler in identifying these cases promptly. A herniated ovary typically appears as an

ovoid mass containing multiple follicles surrounded by echogenic tissue. Markedly reduced or absent vascularity on Doppler imaging strongly suggests torsion [1, 4, 5]. Understanding the anatomy of the canal of Nuck is essential for accurate diagnosis, as this structure can also be the site of other lesions such as hydroceles or cysts that mimic hernias [2]. Awareness of this rare condition allows radiologists and surgeons to act quickly and prevent permanent gonadal damage.

CASE REPORT

A three-month-old female infant with no significant medical or surgical history was born at term with normal growth parameters and psychomotor development. The patient was brought to the emergency department with a one-day history of decreased feeding, reduced activity, and vomiting. The mother also noted a change in urine odor. On examination, the patient was afebrile (36.9 °C), with oxygen saturation of 100% on room air. Random blood sugar was 5.9 mmol/L, and capillary refill time was 2 seconds. The anterior fontanelle was flat. Chest examination revealed equal bilateral air entry with no respiratory distress. Cardiovascular examination was unremarkable. Abdominal examination showed no organomegaly, and bowel motions were normal. A mildly tender, non-reducible swelling was noted in the left inguinal region, clinically suggestive of an inguinal hernia. Laboratory investigations revealed a mildly elevated white blood cell count (14.4 × 10^3/μL) with a normal C-reactive protein level (0.57 mg/L).

Ultrasound of the abdomen and pelvis revealed an ovoid mass in the left inguinal region containing multiple peripheral small cysts, consistent with an ovary. The ovary was enlarged (24.6 × 15.4 mm), with heterogeneous echogenic parenchyma surrounded by echogenic fat (Figure 1A). Color Doppler showed absence of detectable vascularity, findings highly suggestive of left ovarian torsion (Figure 1B). The patient subsequently underwent urgent surgical exploration under general anesthesia. The left inguinal canal was opened, revealing a tight external ring and a sac containing dark fluid and an ischemic edematous ovary with part of the fallopian tube twisted inside (Figure 2). No bowel loops were present. Detorsion and gentle warming were carried out, and gradual improvement in the color of the ovarian tissue was observed. The adnexa were then repositioned into the peritoneal cavity. The hernia defect was repaired using vicryl 4-0 sutures. The patient was discharged three days postoperatively. Follow-up ultrasound after six months showed a normal left ovary.

DISCUSSION

Ovarian herniation through the inguinal canal is a rare entity in female infants, and torsion of the herniated

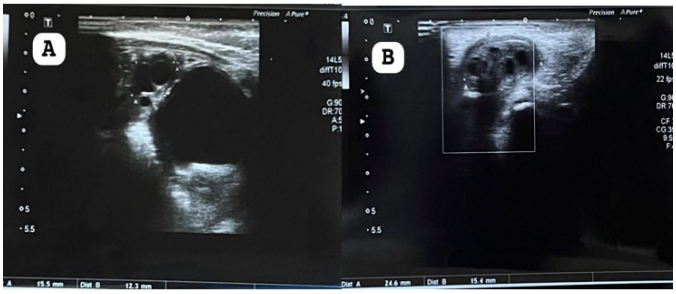

Figure 1: (A) Gray-scale ultrasound of the right ovary showing normal size, echogenicity, and follicular pattern. (B) Gray-scale and Doppler ultrasound of the left ovary demonstrating enlargement (24.6 × 15.4 mm), ovoid shape, heterogeneous echogenicity with multiple internal follicles, and absence of detectable vascularity.

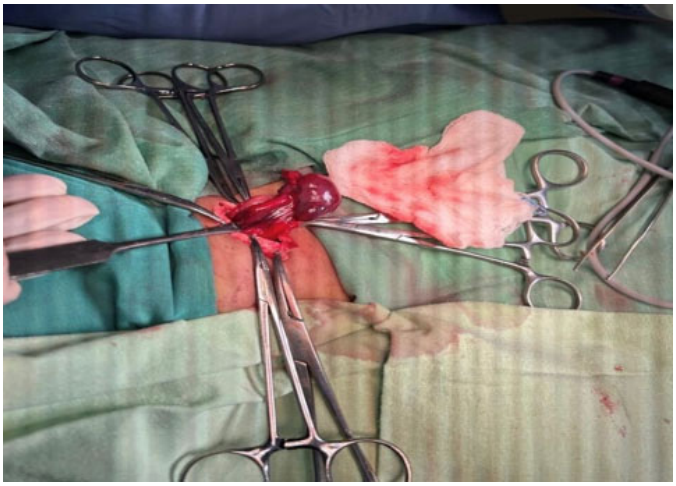

Figure 2: Intraoperative photograph showing the left ovary within the hernia sac. The ovary appears enlarged, edematous, and congested, with a dark purplish discoloration suggestive of ischemic changes.

adnexa is even less frequent. The persistent patency of the canal of Nuck may allow the ovary or fallopian tube to migrate into the inguinal canal [2, 3]. When torsion occurs, blood flow to the adnexa is rapidly compromised, making early recognition and intervention vital for organ preservation.

In the past decade, ultrasound has emerged as the most reliable diagnostic tool for this condition. Several pediatric studies have shown that high-resolution gray-scale and color Doppler ultrasound can accurately identify the ovary within the inguinal canal and confirm torsion by the absence of vascularity [1, 4, 5]. The imaging findings in our patient were consistent with those features and directly influenced the decision for urgent surgical intervention.

Intraoperative exploration in our case revealed torsion of both the ovary and fallopian tube twisted inside the hernia sac. Despite the ischemic appearance, careful detorsion and gentle warming resulted in progressive return of normal color, confirming viability. This observation aligns with recent data showing

that even markedly discolored adnexa can recover if detorsion is performed promptly. Recent data show that prompt laparoscopic detorsion can preserve ovarian function in more than 97% of pediatric cases, supporting a conservative approach whenever possible [6]. Understanding the embryologic anatomy of the canal of Nuck is important, it helps distinguish ovarian herniation from other groin lesions such as hydroceles or lymph nodes. Accurate diagnosis depends on the radiologist's familiarity with these variations, as delayed recognition may lead to unnecessary procedures or compromise ovarian viability [2].

Our case further supports the growing evidence that collaboration between radiologists and pediatric surgeons is crucial in optimizing outcomes. Quick diagnosis informed surgical decision-making, and careful postoperative follow-up can ensure complete functional recovery even in fragile infant patients.

CONCLUSION

This case emphasizes the importance of early recognition of ovarian and fallopian tube torsion within an inguinal hernia in infants. Though uncommon, this condition should always be considered in female infants presenting with an irreducible groin swelling. The differential diagnosis of an irreducible groin mass in a female infant includes hydrocele of the canal of Nuck, inguinal lymphadenopathy, cystic lesions, and incarcerated bowel/inguinal hernia.

Ultrasound with color Doppler remains the first line for diagnosis, allowing real-time assessment of ovarian position and perfusion.

Early imaging combined with timely surgical detorsion can make a crucial difference, enabling full adnexal preservation. As shown in this case and supported by recent literature, even an ovary that appears ischemic can regain viability when detorsion is performed quickly. Close collaboration between radiology and surgery teams is therefore essential to achieve the best outcomes and preserve future reproductive potential.

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Author Contributions

Jamila Omar Abdalla – Conception of the work, Design of the work, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Atif Osman Awadelkreem – Conception of the work, Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Chiman Lal Thakral – Acquisition of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Data Availability

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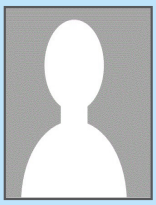

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