

## Ovarian Torsion Associated with Strangulated Inguinal Hernia: A Case Report and Review of Literature

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### Abstract

Inguinal hernias are common in infants and children. In girls, herniated ovary is a relatively common finding, however torsion of the ovary is infrequent. Here we present a 6-month-old girl with a strangulated left inguinal hernia including ovarian torsion. It is also aimed in this report to review the presentation, imaging findings and management of ovarian torsion associated with strangulated groin hernia in children and the patient is discussed under the light of relevant literature.

**Keywords:** *Strangulated Inguinal Hernia; Ovarian Torsion; Children*

### Introduction

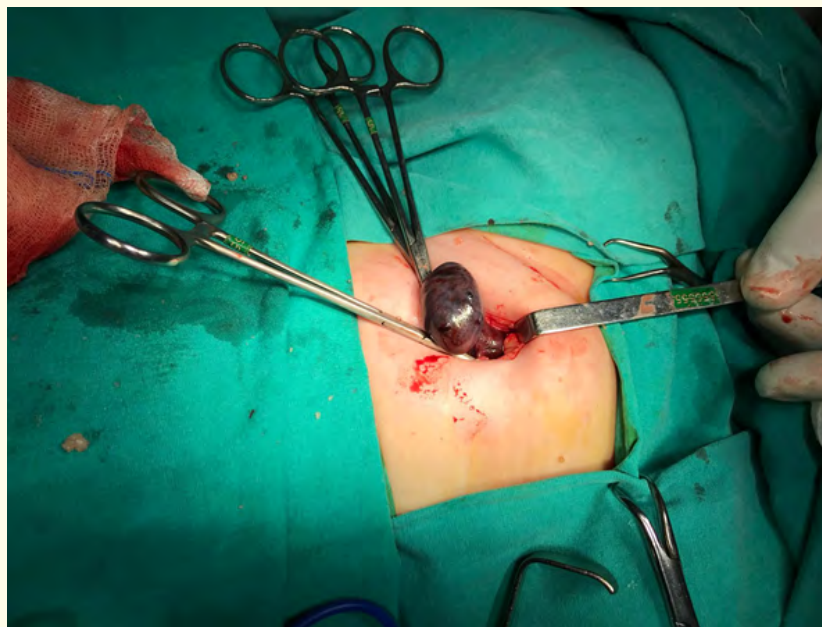
Inguinal hernias are common in infants and children with an incidence range of between 0.8% and 4.4% and the male-to-female ratio is between 3:1 to 10:1 [1,2]. They are almost always indirect. In girls, herniated ovary is a relatively common finding, however torsion of the ovary is infrequent. In this report, a 6-month-old girl with a strangulated left inguinal hernia including ovarian torsion is presented. It is also aimed in this report to review the presentation, imaging findings and management of these patients.

### Case Report

A healthy 6-month-old girl was brought to the emergency department by her parents because of left inguinal painful swelling with a 2 days of history with acute onset. The infant was otherwise well with no significant past medical history. Inspection of the child revealed a left groin swelling with a red edematous skin (Figure 1). When examined a tender, firm mass was palpated in the left inguinal canal which was supposed to be a herniated ovary. Ultrasound revealed a 22 mm heterogeneous mixed echogenicity structure containing several anechoic foci demonstrating an enlarged ovary. At colour Doppler interrogation, no vascular signals could be demonstrated within the ovary. Due to rather long-standing history, tenderness on the inguinal mass and no perfusion during the Doppler interrogation, the baby proceeded hernial sac, the torsion of the left ovary with two counterclockwise turns was seen and was detorsed (Figure 2). After untwisting the ovary was warmed with saline and its capsule was incised but no improvement in perfusion was noticed and oophorectomy was performed (Figure 3). The hernial sac was transfixated and ligated by purse-string fashion. Due to the weak posterior wall of the inguinal canal, anatomical reinforcement using Bassini technique was also added to the procedure at the end for the sake of strengthening the posterior wall of the inguinal canal and contralateral inguinal exploration was not performed. Histopathological examination confirmed the presence of necrosis in the ovary. The child made a good post-operative recovery and was discharged home well the following day.



**Figure 1:** The female infant with a hard, reddish, irreducible mass in the left groin.



**Figure 2:** Operative view at exploration. Note the detorsed ovary is gangrenous.



**Figure 3:** Operative view showing no perfusion in the left ovary after detorsion and incision of the ovarian capsule.

## Discussion

Inguinal hernia is one of the commonest pathology seen in the pediatric surgery practice and it represents a major cause of morbidity and healthcare expenditure in the pediatric population [3-5]. Hernia contents can be bowel loops, ovaries in females, undescended testis, sliding hernia with bladder or appendix lying in the sac or any combination of the above [6].

In females, the inguinal hernia is the result of failure of obliteration of the canal of Nuck, which usually closes by 8 months gestation [2]. The canal of Nuck is the counterpart structure of the processus vaginalis [7] and the persistence of this peritoneal opening is defined as the Nuck cyst and anomalies in the nonobliterated canal may lead to the development of inguinal hernias [8]. Differential diagnosis for female inguinal hernia includes labial hydrocele, lymphadenitis, abscess, rhabdomyosarcoma, metastatic tumors, epidermoid inclusion cysts, cystic lymphangioma and femoral hernia [3,9].

It has been reported that the incidence of an incarcerated ovary within an female inguinal ovarian hernia is between 15 - 30% [1,10]. The incidence of torsed ovary with or without fallopian tubes within the hernia sac varies between 2% - 43% [1,10,11]. With regard to adnexal torsion whether as a hernial sac content or not, if the fallopian tube torsion when it is not associated with torsion of the ovary, the term isolated tubal torsion is used [12]. In a report it was assumed that the primary pathological event was torsion of a normally fixed ovary whilst it lay suspended in the hernial sac [7]. This temporary, precarious arrangement was found to be similar to the "bell-clapper" anatomical event of spontaneous testicular torsion. If the fact that the ovarian vascular pedicle is narrow at the internal inguinal ring, and the size of the ovary is relatively greater than the pedicle is kept in mind, resulting inadequate fixation of the ovary tends toward torsion easily [13]. Due to vascular compromise for the torsed ovary, this potential complication warrants urgent surgical intervention and a delay in surgical intervention may lead to a loss of a reproductive organ such as ovary or fallopian tubes. Despite timely surgical intervention in our case, due to late referral of the patient to the hospital, the left ovary was found to be frank necrotic during surgical intervention and could not be saved and resected, unfortunately.

The presence of an irreducible inguinal hernia containing a tender mass should raise the suspicion of an incarcerated viscus with ovary the most likely in female infants [14]. Unlike inguinal hernias involving testes, strangulation by surrounding loops of intestine within the hernia sac is not thought to be the common mechanism of ovarian necrosis. Instead, in the case of ovarian torsion in the strangulated hernial sac, first venous and lymphatics later on the arterial flow of the ovary is impaired. If prompt management of these children is not carried out, gangrene and tissue necrosis may develop. Apart from physical examination which reveals irritability, tender and nonreducible groin mass, ultrasonography and a color Doppler interrogation is useful adjunct in diagnosing strangulated ovarian hernia with or without torsion. When uncomplicated, the ovary is easily palpated in the inguinal canal and is often easily reducible and the sonographic characteristics include a solid mass, hypoechoic to inguinal fat and containing anechoic follicles [2]. The presence of irreducible hernia containing a tender mass in the groin warrants the usage of ultrasound with Doppler interrogation for the detection of viability in the strangulated viscus and it becomes a matter of necessity rather than of choice in diagnosing a possible nonperfused and necrotic ovarian tissue. Sonographic findings of ovarian torsion can be summarised as an increase in the ovarian dimensions with a heterogeneous echo structure and the presence of peripherally located multiple cysts. Color Doppler sonographic feature of vascular compromise in a torsed ovary includes an absent internal blood flow and whirlpool sign [2,15].

### Conclusion

In conclusion, an ovary-containing hernia should be managed promptly as there is significant risk of torsion. The risk of ovarian necrosis must be explained to the parents before surgical intervention. There should be a suspicion of ovarian torsion within the incarcerated inguinal hernia and every attempt to preserve reproductive capacity of the child should be given a run. This report adds to literature that these two entities can be seen in the same patient and the physicians and radiologists should be aware of this rather rare clinical entity and emergent surgical intervention is paramount.

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