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Ovarian Inguinal Hernia in 1-Month-Old Girl with Horseshoe Kidney

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Abstract

Herniation of the ovaries is a rare congenital anomaly that may be complicated by strangulation, torsion, and infertility. Female pelvic structures such as the ovaries, fallopian tubes, ligaments, and uterus can rarely enter a hernial sac. The aim of this review was to emphasize the fact that early intervention can save the ovary from complications and infertility. A systematic search was conducted of literature published up to 2013 using the Google ScholarTM databases, along with the references of the full-text articles retrieved. Papers on observational studies and case reports concerning ovaries in the inguinal canal were considered eligible for inclusion in the review. Seventeen papers, comprising 24 patients (mean age 45.5), were evaluated. A left-sided hernia was noted in 18 cases (75%), whereas 4 patients had a right-sided hernia (25%). This case is unique in its existence because of the age of presentation (one month) and the complications of horseshoe kidney. Ovarian inguinal hernias can present as early as day one of birth. A thorough history and examination, followed by investigations, can lead to prompt and adequate treatment. In women of reproductive age, repair of the hernia with the intent to preserve fertility is of critical importance.

Keywords Fertility, Inguinal Hernia, Ovarian Hernia.

1. Introduction

An inguinal hernia is the protrusion of abdominopelvic contents into the inguinal canal through a defect that is either an abdominal wall weakness or a congenital defect. Inguinal hernias are of two types: direct inguinal hernia and indirect inguinal hernia. In the pediatric population, an indirect inguinal hernia is due to the presence of part of the peritoneum extending down as it processes vaginalis into the inguinal canal. Normally it obliterates, but partial or complete failure of obliteration of the processes vaginalis in the female results in the formation of a potential space known as the canal of Nuck, into which various organs and/or collections can herniate (1). These are some of the most commonly seen surgical cases worldwide. Inguinal hernias are common findings in early childhood, with a reported incidence ranging from 0.8% to 4.4% (2). In comparison to males, it is relatively less common in females and is called a canal of Nuck hernia (3). Inguinal hernia is a widespread problem and accounts for 75% of abdominal wall hernias, with a probability of incidence of 27% in men and 3% in women (4). Ideally, any abdominal content can herniate through the defect, but most commonly, the intestine and omentum are part of hernial sacs. The incidence of ovaries and adnexal structures in inguinal hernia is rare in adult females, but newborns, infants, and the pediatric population have more cases and are often associated with congenital genitourinary tract anomalies (5). Incarcerated canal of Nuck hernia can be seen in cases of the ovary with or without its fallopian tube and may result in strangulation and torsion that need urgent surgery (6).

2. Case Presentation

A healthy 1-month-old girl was brought to the pediatric OPD by her parents with a complaint of sudden swelling in the left inguinal region. It was not reported that the patient had diarrhea, vomiting, or a fever. The mother of the baby during pregnancy has no complaints.

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The baby was delivered through a normal vaginal delivery at the hospital, and the pregnancy was full-term. There were no complications during delivery. There was no complaint of cyanosis, jaundice, or any other issue that required admission to the nursery. The patient's medical and surgical history was unremarkable; she is the third child of this female. At the age of 1 month, the parents of the baby noticed swelling at the left inguinal region. On examination, the patient's vitals were pulse = 150, oxygen saturation = 95%, and temperature = 99 oF with no oxygen support. There was swelling at the left inguinal region, which was reducible, soft in consistency, and 2 cm. The rest of the examination was unremarkable. She was admitted to the pediatric ward, and all baseline investigations were performed and found to be normal. Her ultrasound scan was performed, which diagnosed her as having a case of a left inguinal hernia containing an ovary, along with that horseshoe-shaped kidney seen as an incidental finding on ultrasound as well (Figure 1). During surgery, the ovary was found viable by assessment, was reduced, and a herniotomy was done (Figure 2). The patient was shifted to the recovery room and fully recovered without any complications. On the first post-op day, the patient was vitally stable, her wound was clean, and she was on the way to recovery.

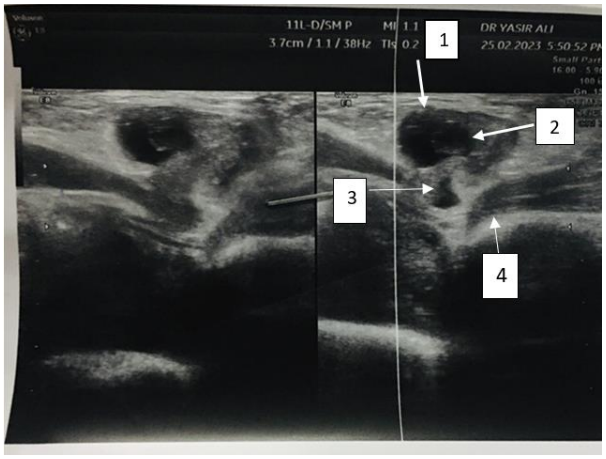

Figure 1: Shows ultrasound of the patient
1. Hernial Sac, 2. Ovary, 3. Defect, 4. Muscle

On the 7th post-op day, her stitches were opened and the wound was examined, which was clean with no active discharge.

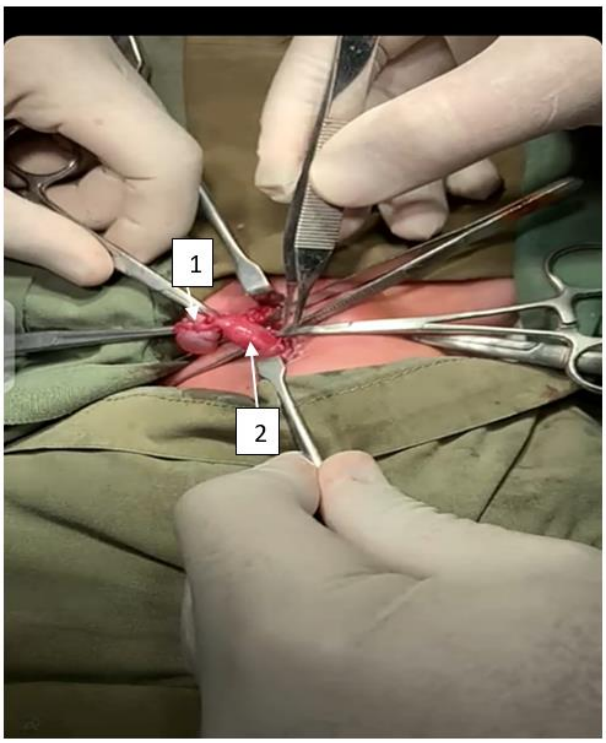

Figure 2: Ovary in Inguinal Hernia
1. Ovary, 2. Fallopian Tube.

Figure 3: Clean and Stitched Wound 2nd Post-op Day.

3. Discussion

Indirect Inguinal hernia is very common in young age groups, especially in the pediatric population. The ongoing detailed occurrence of inguinal hernia in pediatric age nearly ranges from 0.8% to 4.4% (7). During the early stage of embryonic development, the

Table 1: WBC (white blood cells), RBC (red blood cells), HB(hemoglobin), HCT(hematocrit), MCV(mean corpuscular volume), PLT(platelet), ALT(alanine transaminase), µl(microliter), dl(deciliter), fl(femtoliter), mmol(milimole), mg(milligram), U/L(units per liter).

Sr No.	Name	Normal range	Unit(s)	Baseline Before surgery
1.	WBC	4-11	×10.e 3/µl	12.2
2.	RBC	4-6	×10.e 6/µl	3.22
3.	HB	11.5-17.5	g/dl	11.2
4.	HCT	36-53	%	31.4
5.	MCV	76-96	fL	97.5
6.	PLT	150-400	×10.e 3/µl	170
7.	Sodium	135-150	mmol/L	137
8.	Potassium	3.5-5.5	mmol/L	4.1
9.	Chloride	96-106	mmol/L	99
10.	Blood urea	18-45	mg/dL	17
11.	Creatinine	0.7-1.4	mg/dL	0.82
12.	Calcium	8.0-10	mg/dL	9.59
13.	Total bilirubin	0.1-1.0	mg/dL	0.3
14.	ALT	10-50	U/L	19

female inguinal canal has the ilioinguinal nerve, the gubernaculum, and the processus vaginalis (8). The processus vaginalis is an evagination of the parietal peritoneum seen following 12 weeks of gestation (9). Depending on the gender, it is joined by the testis, or round ligament of the uterus, and passes through the inguinal canal to the scrotum, or labium major. The processus vaginalis is somewhat small in female babies. Going with the processus vaginalis is the gubernaculum, whose female remnants become the round and ovarian ligaments in adults. Around the seventh month of development, the processus vaginalis is obliterated step by step in a craniocaudal direction and closes by the primary year of life (10). Sometimes it remains open partially or completely and is named the Canal of Nuck (11). This canal of the nuck creates a potential space for the abdominal and pelvic contents and collection to go through as a hernia (12, 13). The contents of this canal may be gut loops, omentum, appendix, uterus, fluid collection, ovary, and fallopian tubes. The ovary and fallopian tubes in the canal of Nuke are a rare presentation in the inguinal hernia. Other differentials for a female child with labia majora swelling are hydrocele, lymphadenopathy, abscess, and any benign or malignant neoplasm. There are a significant number of cases reported with the presentation of the ovary and fallopian tubes in the inguinal hernia at the age of more than one month, but our case is very different from others. We have a patient of one month with such a presentation and horseshoe kidneys on ultrasound as an accidental finding. One of the possible mechanisms of such presentation is the weakness of the uterine and ovarian suspensory ligaments. That's what Thompson noticed: assuming there is failure of fusion of the Mullerian ducts, it leads to an increase in the mobility of the ovary and uterus, expanding the chance of herniation of the ovary, fallopian tubes, and uterus into the inguinal canal (14). These structures in the hernia can have unwanted consequences. Recognising the signs of a hernia containing compromised contents is essential to preventing serious complications such as ovarian damage, testicular atrophy, sexual disorders, and intestinal perforation (15). Ultrasonography is the best initial imaging modality to identify these structures in the canal of Nuke in order to prevent incarceration of the ovary and prompt surgical steps towards its management (16, 17).

4. Conclusion

Ultrasonography is the best initial investigation to timely diagnose the ovary and its adnexal structures in the canal of Nuck. After timely diagnosis, early intervention can prevent greater damage to sensitive contents that can be retrieved back to the abdomen and pelvis. We want to bring to the attention of pediatric surgeons that the ovary, fallopian tubes, and uterus can

be the contents of an inguinal hernia so that they can do early intervention to save the structures and fertility of the patient.

Conflict of Interest The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Consent An informed consent taken from the patient's attendant for reporting this case.

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