

Isolated left descended inguinal ovary with ipsilateral ectopic pelvic kidney: a case report and review of literature

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Summary

Isolated descended inguinal ovary is a rarity, but it should be considered as a differential diagnosis of an inguinal mass at any age; in particular during female infancy and up to adulthood. Herein the authors report a case of asymptomatic isolated left descended inguinal ovary, with ipsilateral left ectopic pelvic kidney that was accidentally discovered a few years after menarche.

Key words: Inguinal mass; Ovarian descent; Ectopic ovary; Pelvic kidney; Ovarian biopsy.

Introduction

Historically, Donald [1] and Mayer and Templeton [2] pointed out that inguinal ovarian hernia could be “true ectopia” of the ovary or “simple ovarian hernia”. In true ectopia, the tube accompanies the ovary, however, in both instances, a persistence of the canal of Nuck and congenitally long ovarian ligament that fails to be attached to the uterine cornea, all play roles in the development of this abnormal ovarian position. In addition, inguinal ovarian hernia is dependent on chronic repeated/increases in intra-abdominal pressure e.g. pregnancies, chronic coughing, etc. [3] and possibly adhesions of the ovary to the herniated intestinal loop or mesentery [4]. On the other hand, it

is known that the ligament in the inguinal canal to be the round ligament and it is homologous to the male gubernaculum testis. Therefore, an isolated ovary in an inguinal hernia might be assumed to mimic descent of testis and it is not so much a prolapsed, but a “descended gonad” [4] i.e. the round ligament may initiate ovarian descent and pass partially or entirely through the inguinal canal into the ipsilateral labium majus.

Based on this embryological fact the present authors preferred to use the term “ovarian descent” to describe isolated inguinal ovarian hernia with or without fallopian tube herniation (Figure 1). Herein they report a case of asymptomatic isolated left descended inguinal ovary with ipsilateral left ectopic pelvic kidney that was incidentally discovered a few years after menarche.

Case Report

A 16-year-old presented with a left inguinal mass, which was painless and discovered accidentally. There were no associated symptoms as fever, abdominal pain, vomiting or vaginal bleeding. She has unremarkable medical and surgical histories and had a normal menarche at the age of 13 years and she is regularly menstruating every 29 days. Her general examination revealed normal vitals, BMI, chest, and abdominal findings. There was no lymphadenopathy. She had a normal phenotypic appearance with well-developed secondary sexual characters (Tanner Stage IV). In the left groin, a firm, mildly tender, oval, and immobile mass was palpated. It was $\pm$ three cm in size and no cough impulse was elicited during examination. Careful palpation of both labia majora did not reveal any abnormal findings. Routine blood investigation and urinalysis showed normal findings and basic hormonal assay showed normal levels of FSH, LH, E₂, TSH, and testosterone.

Transabdominal ultrasound scanning (USS) with five-MHz

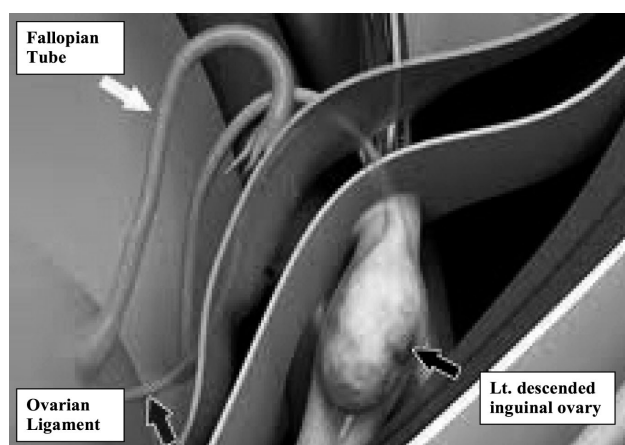


Figure 1. — A diagram of a left isolated ovarian descent through the inguinal canal into the left inguinal region. Of note is that the fallopian tube is not accompanying the ovary.

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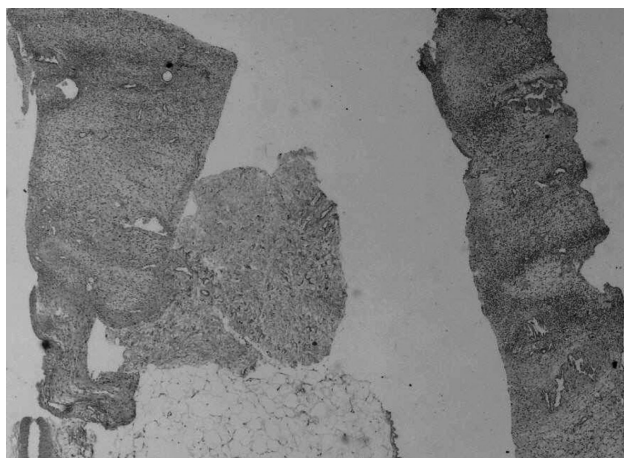


Figure 2. — Photomicrograph showing a core biopsy of ovarian stromal tissue and tiny follicles (Hematoxylin & Eosin stain, original magnification $\times 25$).

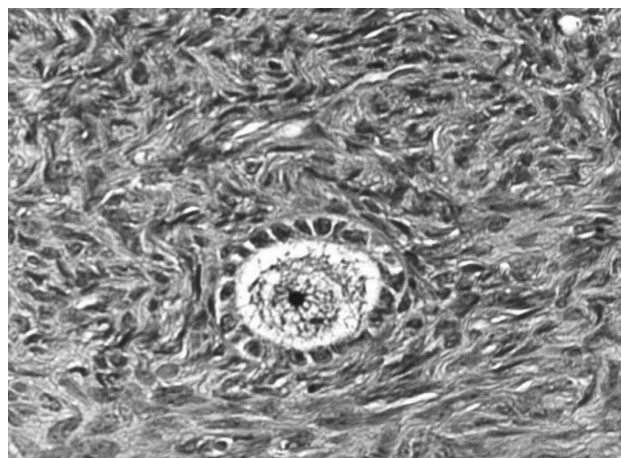


Figure 3. — Photomicrograph showing a primary ovarian follicle containing an oocyte (Hematoxylin & Eosin stain, original magnification $\times 200$).

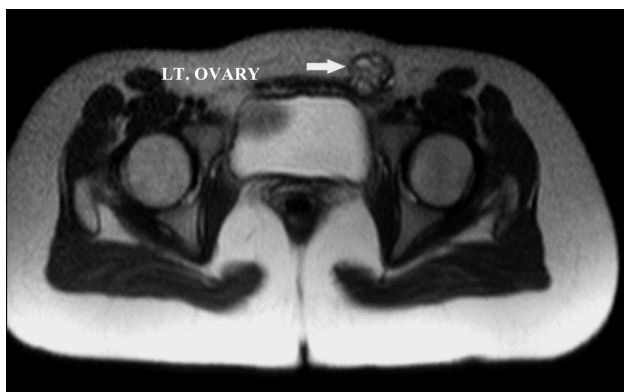


Figure 4. — Axial T2-weighted MRI of the pelvis. The left ovary is clearly visualized in the subcutaneous tissue of the left inguinal region with normal clearly identified ovarian follicles (arrow).



Figure 5. — Coronal T2-weighted MRI of the pelvis. [O] The right ovary is in its normal location in the pelvis with normal follicular appearance. [U] The uterus appears normal with no obvious uterine anomalies. [K] The left kidney is ectopic in the pelvis (anterior to the sacrum) with no hydronephrosis.

convex probe showed the following: normal right ovary, uterus, and absent left ovary. A mass in Douglas pouch was seen with typical appearance of a kidney with normal pelvicalyceal system (left pelvic ectopic kidney). The right kidney was orthotopic with normal appearance. Ultrasound examination of the left groin revealed a superficial ovoid “multicystic” mass with heterogeneous areas. It was measured $\pm 3.3 \times 2.4 \times 3.1$ cm in size and located medial to the femoral vessels. No bowel loops, fluid collection, or other contents were seen.

The case was referred to “guided biopsy” with the top differential diagnosis degenerated lymph nodes including necrotic areas. Hydatid cyst with daughter cysts was also entertained. Two core biopsies using gauge-14 automated biopsy gun were obtained under ultrasound guidance. Unexpectedly, the histopathological examination confirmed normal ovarian tissues with stroma containing a few follicles at various stages of development (Figures 2 and 3). For detailed evaluation of pelvic organs, MRI was requested.

MRI of pelvis with contrast showed an isolated left ovary which was clearly visualized in the subcutaneous tissue of the left inguinal region with normal vascularity and enhancement post-con-

trast administration (Figure 4). The vascular supply of this ovary appeared extending through the inguinal canal; no other accompanying structures were seen (e.g. tube, loop of intestine, etc).

The left kidney was ectopic in the pelvis (anterior to the sacrum) with normal contrast enhancement and with no evidence of hydronephrosis (Figure 5). The right kidney, right ovary, and uterus, all were normal in location with normal appearance and with no evidence of obvious anomalies. It was concluded to be a case of isolated left descended ovary in the left inguinal region with its blood supply clearly descending through the left inguinal canal and no other visible contents. This was associated with ipsilateral left ectopic pelvic kidney. Taking in consideration the risk

of ovarian torsion, the patient was counseled for urgent reduction, but the patient refused and the reduction was not done.

Discussion

Hernia of an ovary is rare, and 95% of ovarian hernias are inguinal [2]. However, the prevalence of ovaries and fallopian tubes in operable inguinal hernias is only 0.9% [5]. Normally the descent of the ovary is prevented by the fixation of the gubernaculum of the ovary (the angle of the ovarian and round ligaments) to the cornu of the uterus [3]. In 1941, Mayer and Templeton [2] compiled and evaluated all the cases reported in the world literature and diagnosed as inguinal ovarian ectopia ($n = 195$ cases). They reported that 64% of tubo-ovarian hernias were in children less than two years of age and 71% in children fewer than five years of age (*i.e.* pediatric age group). However, the present patient presented with her descended ovary at a relatively older age (16-years-old).

Similarly, few case reports of isolated tubo-ovarian hernias presented at this age and more elder age were discussed in literatures. Presence of ovary and tube in inguinal hernia was reported in an unmarried 19-year-old patient presenting as an incarcerated hernia [6]. In addition, the left ovary, contained a hemorrhagic cysts, along with the left fallopian tube and left broad ligament were found in a sac of a strangulated hernia of a 31-year-old woman [7]. Two other cases of ovulating ovaries and tubes incarcerated in inguinal hernias were reported by Golash and Cummins, [8] and Bradshaw and Carr, [9] in two women aged 23 and 18 years, respectively. Lastly, a 39-year-old woman was diagnosed to have an irreducible inguinal hernia containing ovary and tube as reported by Ballas *et al.* [10]. It is noticed that the aforementioned cases were associated with anomalies of the uro-genital systems.

The nature and location of gonads in inguinal hernia can be determined by using high-resolution real-time ultrasound. It is claimed that the appearance of an ovary is quite distinct from other inguinal masses as lymph nodes, testis, and other structural abnormalities of the groin. These characteristic include eliciting a mass with multiple small sonolucent cysts indicating ovary [11]. Furthermore, trans-abdominal sonographic scans of pelvis may reveal the absence of one ovary in the lower pelvis on the same side as the inguinal hernia [12]. Use of color Doppler depicts the vascularity and can reveal early vascular compromise of ovary [11]. However, in the present case, the ultrasonographic scanning of the inguinal region showed an undetermined complex "multicystic" mass with heterogeneous areas. Absence of the characteristic appearance of the ovary (*i.e.* its peripheral small sonolucent areas) led the present authors to suspect a degenerated inguinal lymph node as a top differential diagnosis and ultrasound-guided biopsy was

performed. Histopathological examination showed healthy ovarian tissues and ovarian inguinal hernia was confirmed.

MRI is the gold standard radiologic diagnostic tool for evaluation of the suspected Müllerian anomalies [13]. Occurrence of an ovary in an inguinal hernia in adult females is a common indicator of genital tract developmental defects [9]. On MRI examination of the present patient, no definite mal-developments of the genital tract were identified. However, anomalous finding in the renal system was confirmed as an ipsilateral left ectopic pelvic kidney with normal pelvicaliceal system. Only few isolated cases of ovarian hernia are not associated with genital anomalies [14, 15].

The fallopian tube follows the ovary into the inguinal canal since the proximal portion of the Müllerian duct is closely associated with ovary in its development [2]. Unexpectedly, in the present patient, careful MRI assessment of the inguinal canal confirmed the absence of fallopian tube and other pelvic viscera (*i.e.* an isolated ovarian descent). Despite the efforts made to diagnose the nature and contents of inguinal hernia prior to surgery, most of them were diagnosed accurately only intraoperatively [7].

Literatures review showed that irreducible inguinal ovary is not at risk of compression of its blood supply, but at significant risk of torsion along with its tube on its pedicle, while suspended out of the inguinal canal [16]. That is why asymptomatic non-reducible inguinal ovary should be treated as an incarcerated hernia with urgent reduction, either manually or operatively [17]. Nevertheless, some infantile cases of ovarian inguinal hernia had been managed conservatively with spontaneous regression [18].

Of the total incidence of female inguinal hernias, between 4% to 37% cases presented with non-reducible ovaries at time of surgery, of which 2% to 33% the ovary was twisted and infarcted [16, 17]. The presence of an ovary in the inguinal canal requires either laparoscopic or conventional surgical exploration [18, 19]. The aim of operative management of this rare anomaly is to preserve and reposition the ovary in the abdominal cavity [19]. Actually, the present authors speculated that being asymptomatic case with absence of fallopian tube or loops of intestine with the descended ovary might decrease the risk of significant compromise of its blood supply or torsion. Thus, they accepted the patient's decision to delay surgery up to the summer holiday; with regular follow up visits. She was fully counseled regarding the risk of ovarian torsion during conservative treatment.

In conclusion, the presented case of isolated descended inguinal ovary is a rarity but it should be considered as a differential diagnosis of an inguinal mass at any age; in particular during female infancy and up to adulthood. Although surgical or manual reduction is recommended once it is suspected, the authors believe that there is a place for a temporary expectant treatment under close follow-up.

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