

Ovarian Herniation of the Canal of Nuck, a Case Report.

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Introduction

During embryonic development, the female inguinal canal hosts the ilioinguinal nerve, the gubernaculum, and processus vaginalis [1]. The processus vaginalis is an evagination of the parietal peritoneum seen after 12 weeks of gestation [2]. Accompanying the processus vaginalis is the gubernaculum, whose female remnants become the round and ovarian ligaments in adults. Around the 7th month of gestation, the processus vaginalis gradually obliterates in a craniocaudal fashion and closes by the first year of life [1,3] (Figure 1). Failure of the processus vaginalis to obliterate results in a patent opening referred to as the canal of Nuck (coN). Non-obliteration results in two potential outcomes. First, if superior obliteration begins but terminates abruptly, the inferior portion of the coN forms a fluid-filled cavity called a hydrocele. Just as in males, hydroceles in females can remain asymptomatic or sometimes become infected or hemorrhagic [3]. Alternatively, if obliteration does not occur at all, the entire width of the coN remains patent. In females, a patent coN is a predictive anatomic risk factor for hernias [1]. Various organs and/or tissues can protrude through the canal, including omental fat, bowel loops, ovaries, the uterus, fallopian tubes, and the bladder [2,4,5]. In infants, a coN hernia presents as a labial mass or groin swelling. Swellings may be painful and non-reducible [2,3].

Compared to those in males, pediatric inguinal hernias in females are seldom discussed in the literature [4]. Here, we present a case of a female infant who presented with a right ovarian inguinal hernia.

Case Report

The patient was a 4-month-old female who presented with a right labial mass. She had a history of prematurity, patent ductus arteriosus status post-coiling, and severe bronchopulmonary dysplasia. On the physical exam, there was no erythema, overlying skin changes, or tenderness. Physical exam findings were compatible with a non-reducible inguinal hernia and no evidence of strangulation.

Ultrasound of the pelvis and inguinal region was performed. There was an oval shaped, well-defined mass in the right labia with heterogeneous echotexture and multiple scattered hypoechoic foci (Figure 2). Color Doppler images demonstrated normal color flow to the mass (Figure 3). Based on ultrasonography and the physical exam, there was no evidence of a herniated mass or hydrocele in the left inguinal region. Findings were compatible with a herniated ovary in the right coN.

Discussion

Pediatric inguinal hernias are rare, with a reported incidence of 0.8-4.4% [3]. Most pediatric hernias are indirect and occur at male-to-female ratios of 4:1 to 10:1 [1]. Premature infants are at increased risk of

hernias due to non-obliteration of the processus vaginalis, with an incidence of 9-11% in premature infants of any term and 30% in premature infants weighing less than 1000g [1]. Among inguinal hernias in females, the ovary is most commonly involved and is implicated in 15-22% of cases [1,4]. Tension from the round and ovarian ligaments potentially plays a role [4].

Ultrasound is the most cost-effective modality for initial imaging of suspected coN hernias and provides adequate spatial resolution without exposing children to radiation. On ultrasound, ovarian hernias appear as solid masses containing multiple cysts of varying size [5]. Right-sided herniation is more common (56% of coN hernias) due to delayed obliteration of the right processus vaginalis and/or protection of the left deep inguinal ring by the sigmoid colon [1,3]. In our case, herniation of the right ovary was appropriately identified through ultrasound (Figure 2).

Early diagnosis of ovarian inguinal hernia is critical because of the risk of incarceration, in which the herniated ovary becomes non-reducible. Some studies report incarceration occurring in 43% of ovarian inguinal hernias [3]. Incarcerated ovaries can predispose to strangulation and/or torsion, resulting in impaired blood flow and eventual tissue necrosis if the hernia is not reduced. On ultrasonography, a torsed ovary appears enlarged with heterogeneous echogenicity and no blood flow on Doppler evaluation [5]. In our case, Color Doppler revealed appropriate blood flow to the right ovary without evidence of strangulation or torsion (Figure 3).

Canal of Nuck hernias involving the ovary are rare and possibly underreported. Discussion of such hernias is warranted so that radiologists are familiar with their presentation. Prompt recognition can help prevent complications in young patients.

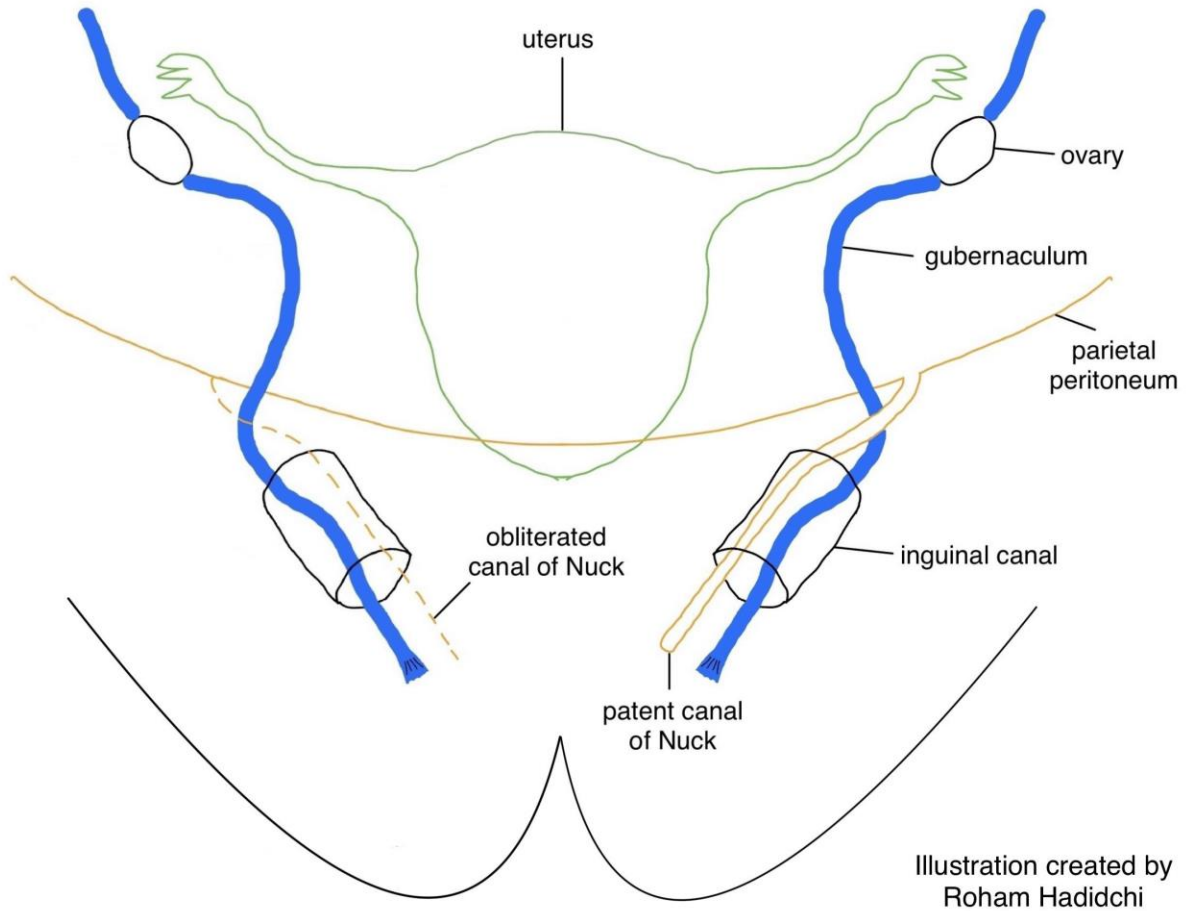


Figure 1: Illustration of the fetal female pelvis and inguinal canal. The gubernaculum and the canal of Nuck originate from the peritoneal space and pass through the inguinal canal toward the labia majora.

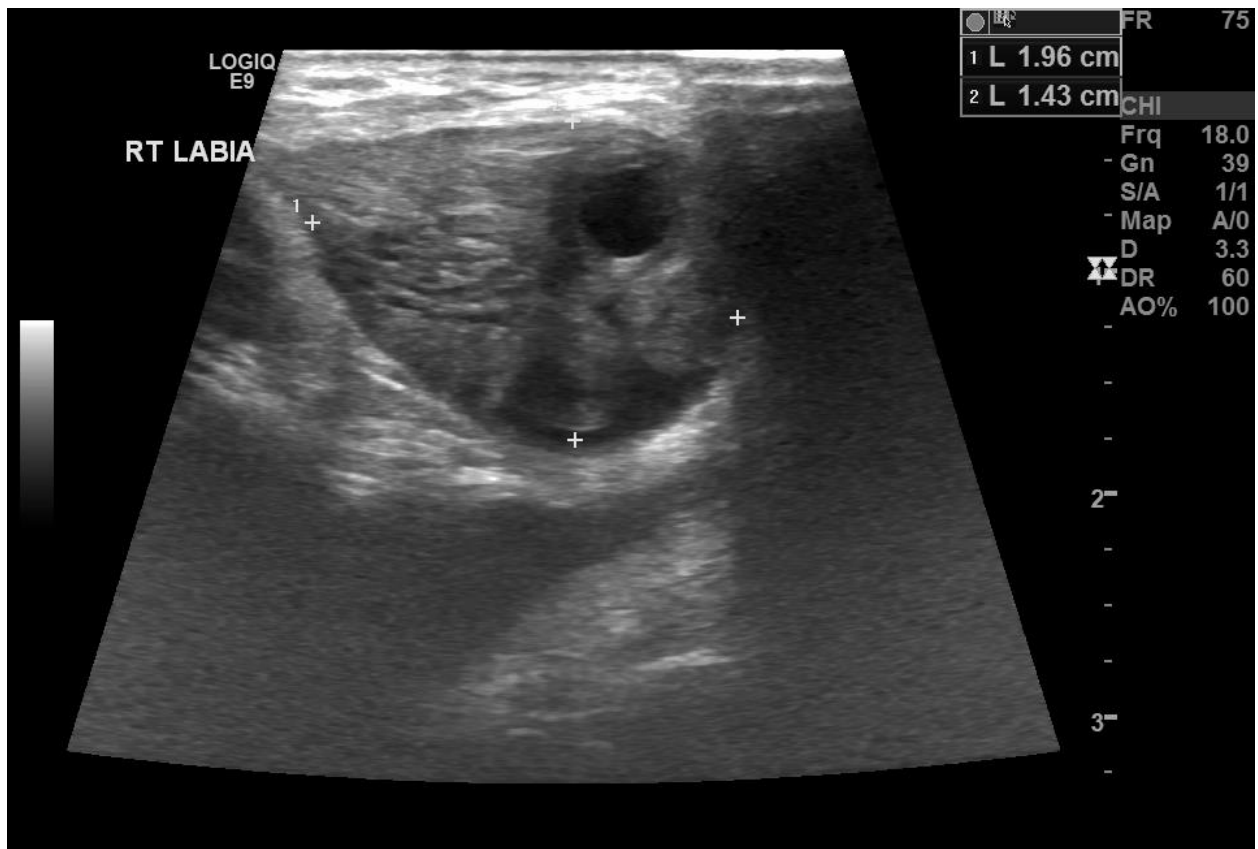


Figure 2. Well-defined mass in the right labia with heterogeneous echotexture and multiple scattered hypoechoic foci compatible with ovarian follicles.



Figure 3. Color Doppler reveals adequate blood flow to the herniated ovary.

References

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