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Hydrocele of the canal of nuck in a 4 years old female: A case report

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Abstract
Background: The processsus vaginalis follows the round ligament or testis via the inguinal canal into the labium majus or scrotum during development. During the first year of life, the canal of Nuck is usually eliminated. Failure to achieve complete obliteration results in an indirect inguinal hernia or canal of Nuck hydrocele
Case Presentation: A 4 years old girl brought by her parents to pediatric emergency department of King Fahad Medical City, Riyadh with swellings in the right groin for one month. Local examination reveled a pear shaped 3×2cm irreducible, fluctuant swelling in the right inguino-labial region with no cough impulse. Ultrasound reveled cystic lesion seen occupies the right inguinal canal. It measures 3.5cm×1.7cm. It shows internal debris. The patient postoperative course was uneventful, and she was discharged the next day.
Conclusion: Female hydrocele is relatively uncommon in surgery and should be explored in the differential diagnosis of any inguinolabial swelling in adult females. This illness might be misinterpreted as an irreducible inguinal or strangulated femoral hernia, making clinical identification difficult. After a thorough medical history and clinical examination, the diagnosis can be suspected. To approach the condition, a professional and qualified interdisciplinary team of surgeons, radiologists, and pathologists is required.

Keywords: Hydrocele, canal of nuck, Inguino-labial region, ultrasound, surgery Disection

Introduction

A "female hydrocele" of the canal of Nuck is the female analogue of a spermatic cord hydrocele (encysted hydrocele) in males. [1, 2] The processus vaginalis follows the round ligament or testis via the inguinal canal into the labium majus or scrotum during development. [1] During the first year of life, the canal of Nuck is usually eliminated. Failure to achieve complete obliteration results in an indirect inguinal hernia or canal of Nuck hydrocele. [3] In 1691, the female hydrocele or cyst of the Canal of Nuck was called after Anton Nuck, a 17th century anatomist. [4] The prevalence of a patent processus vaginalis declines with age. A patent processus vaginalis is found in 80-94% of births. At autopsy, up to 30% of people are found to have a patent processus vaginalis. [5] Hydrocele of the canal of Nuck is more common in adult females and less common in newborns and post-pubertal girls. [6]

On ultrasonography, the canal of Nuck is hypoechoic or anechoic, and comma- or mushroom-shaped unilocular. [7] It resembles a multilocular cystic mass with linear septa in rare cases. Although the CT scan revealed a channel of Nuck hydrocele in the form of a homogenous fluid-filled unilocular cyst extending to the labia, communication with the abdominal cavity could not be determined. In the canal of Nuck hydrocele, MRI revealed well-defined, thin-walled, sausage-shaped cystic lesions. [8]

In the case of a hydrocele, ultrasound imaging should reveal the presence of a cystic mass lying superficially and medially to the pubic bone at the level of the superficial inguinal ring and no communication with the peritoneum. There is no evidence of the Valsalva manoeuvre. [9] There is a scarcity of literature on CT findings for this illness. According to one case report, the CT results of hydrocele are as follows: unilocular cyst filled with homogeneous fluid that extends to the labia and On CT, the inguinal canal communication may be missed. The morphologic and anatomic findings should be comparable to those reported by MRI. [10] Infection is a rare complication of hydroceles in children, with only 5 occurrences recorded in the English language literature to date, all in males. [11]

This study aims to explain the clinical picture, radiological notes, histological results, differential diagnosis, and surgical treatment of this condition in light of our experience because distinguishing it from other clinical mimics is critical.

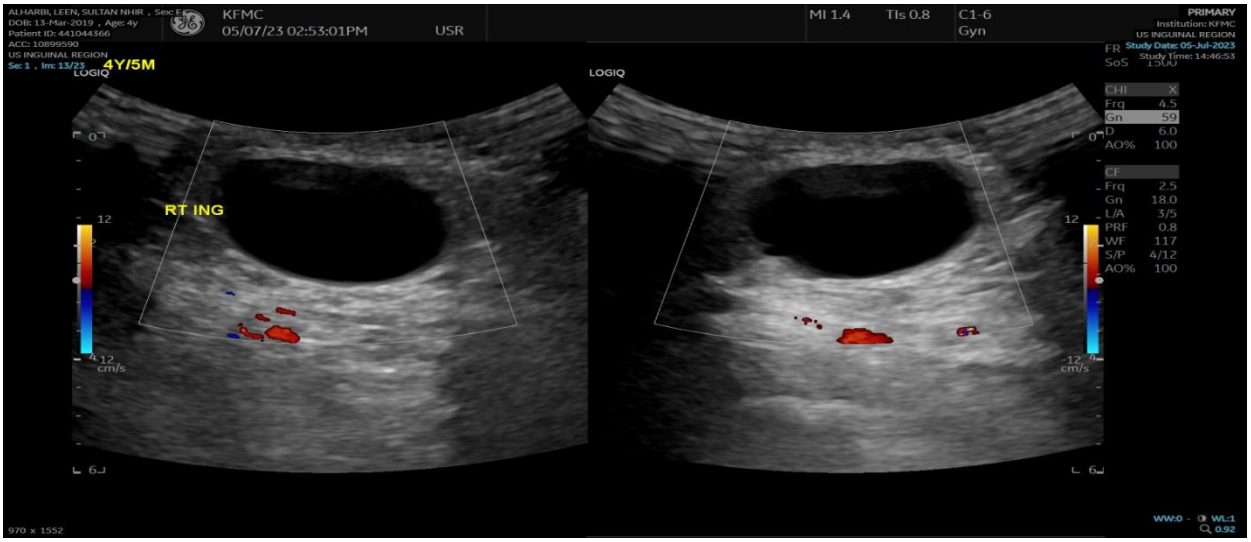
Findings

A 4 years old girl brought by her parents to pediatric emergency department of King Fahad Medical City, Riyadh with swellings in the right groin for one month. The swelling was initially of the size of a peanut but gradually enlarged to reach the present size (Fig1). There was no association with pain or other signs of obstruction. Local examination reveled a pear shaped 3* 2cm irreducible, fluctuant swelling in the right inguino-labial region with no cough impulse. The swelling was trans-illuminant but no thrill or bruit was noted over the swelling. The skin over the swelling was normal. Past history of being operated for malroation at age of 15 months. A differential diagnosis of an inguinal hernia or hydrocele was made from the clinical picture.

Laboratory tests showed measured parameters were within the normal range. Ultrasound reveled cystic lesion seen occupies the right inguinal canal. It measures 3.5cm * 1.7cm. It shows internal debris. No soft tissue component. No frank communication to the peritoneal cavity through the inguinal opening. There is no adnexal mass or cyst. The

cyst in the right inguinal canal is suggestive of hydrocele of the canal of Nuck.

The diagnosis of Nuck cyst was considered and the patient was operated on. The cyst was extended down to the right labia majora and it was clearly seen to be an encysted hydrocele of canal of the nuck, without any evidence of associated inguinal hernia. During surgery, the cyst was separated from the round ligament in the inguinal canal by an inguinolabial incision, and the sac's neck was extended up to the deep ring. Histology confirmed the presence of Nuck cyst. The patient postoperative course was uneventful, and she was discharged the next day.



Discussion

The secretory lining of the processus vaginalis produces peritoneal fluid, which can contribute to cystic enlargement. The aetiology of such cystic swelling is usually idiopathic, with other reasons including inflammation, trauma, lymphatic drainage impairment, and meconium hydrocoele. The secretory lining of the processus vaginalis produces peritoneal fluid, which can contribute to cystic enlargement. The aetiology of such cystic swelling is usually idiopathic, with other reasons including inflammation, trauma, lymphatic drainage impairment, and meconium hydrocoele. [12] A hydrocele of the canal of Nuck might present clinically as a painless or moderately painful fluctuant inguinal mass with no associated nausea or vomiting; thus, it is difficult to diagnose this entity based solely on clinical signs. These masses are not reducible and can be transilluminated if large enough. When the peritoneal evagination stays totally open, an indirect inguinal hernia might occur. A hydrocele of the canal of Nuck is anatomically possible when there is partial proximal obliteration, which leaves the distal portion of the processus vaginalis accessible. [1]

Swelling in the female inguinal region can be caused by a variety of factors, including inguinal hernia, tumours (lipoma, leiomyoma, and sarcoma), cysts, abscesses, and lymphadenopathy. A Bartholin gland cyst and a Gartner duct cyst should be included in the differential diagnosis of a vulval hydrocele. The hydrocele of the canal of Nuck is currently thought to be more prevalent than previously reported; yet, it remains an unknown disease for clinicians, and some instances are misdiagnosed as inguinal hernias, Bartholin cysts, or Bartholin abcesses before surgery. [3]

There are three forms of Nuck canal hydrocele. The most frequent type has no communication with the peritoneal cavity, resulting in an encysted hydrocele that runs from the inguinal ring to the vulva. When there is persistent connection with the peritoneal cavity, the second kind occurs. A third type is a combination of the two caused by the inguinal ring constraining the hydrocele like a belt, allowing part of the hydrocele to communicate while the other remains confined, hence the name hour glass type. Any of these varieties of hydroceles, however, are relatively uncommon in girls. [13] Laparoscopic surgery had been recorded in a few cases in a selected sample of reproductive age patients with no current pathology in the hands of an expert surgeon. Alternative treatments, such as ultrasound-guided cyst aspiration, have not been described in a single case in the medical literature and pose a higher risk of recurrence once performed. [6] Because of its low cost and wide availability, ultrasonography can be used for initial imaging; however, MRI can provide more precise images, including septations and communication between the cystic lesion and the peritoneal cavity, as well as information on the anatomical relationships with adjacent structures. [9]

Conclusion

Female hydrocele is relatively uncommon in surgery and should be explored in the differential diagnosis of any inguinolabial swelling in adult females. Because of its rarity, this illness might be misinterpreted as an irreducible inguinal or strangulated femoral hernia, making clinical identification difficult. After a thorough medical history and clinical examination, the diagnosis can be suspected. To approach the condition, a professional and qualified interdisciplinary team of surgeons, radiologists, and pathologists is required. Magnetic resonance imaging (MRI) is used to diagnose various patients. Surgical-pathological correlation is the best technique to reach a final diagnosis of a female hydrocele canal of nuck. For treating an adult female encysted hydrocele, the traditional surgical method is an effective and safe alternative.

Consent for publication

Written informed Consent was obtained from the father for publication of this case report.

Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

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Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

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