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US-CT and MRI Aspect of Hydrocele of the Canal of Nuck (Female Hydrocele): A Case Report

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Abstract: The hydrocele of the canal of nuck is a small evagination of the parietal peritoneum which is attached to the uterus by the round ligament through the internal inguinal ring into the inguinal canal. This entity is mostly painless, fluctuating, nonreducible swelling in the inguino-labial area. We present a case of a 36 year old female that presented with right sided inguinal swelling. The diagnosis was performed by using imaging methods, and she was treated surgically. Imaging methods, especially Ultrasonography and MRI play important roles for diagnosing the hydrocele of the canal of Nuck. We discuss the radiologic findings of a case of hydrocele of the canal of Nuck.
Keywords: Hydrocele, Canal of nuck, Processus vaginalis, Radiology

INTRODUCTION

The canal of Nuck is homologous to the processus Vaginalis in males. This is a small evagination of the parietal peritoneum which is attached to the uterus by the round ligament through the internal inguinal ring into the inguinal canal. [1-5]. The canal of Nuck usually obliterates during the first year of life. An incomplete obliteration (failure of closure) may lead to development of an indirect inguinal hernia or hydrocele [1-6]. In 1691, the canal of Nuck was first described by Dutch anatomist Anton Nuck [1,3,6]. Hydrocele of the canal of Nuck is a rare disease that occurs in the inguinal area or labium [1]. The canal of Nuck is divided into two layers and derived from the abdominal wall [1]. The outer wall consists of fibrous form and smooth muscle fibers while inner wall consists of mesothelial cells. An imbalance between the secretion and absorption of fluid in the secretory membrane on the inner wall results in hydrocele or cyst of the canal of Nuck [1,3-5]. The aetiological factors creating such cystic swelling are mostly idiopathic. Other factors may be related to inflammation, trauma, impairment of lymphatic drainage [1,3-5]. Here, we have reported the case of a patient with hydrocele of the canal of Nuck diagnosed by ultrasonography, computed tomography and MRI examination.

CASE REPORT

A 36-year-old female presented to the surgical outpatient department with complaints of swelling in her right groin and labia majora for a period of two months. Swelling was not painful and sudden in onset, and the patient reported a slight increase in the size of the swelling since its occurrence. Upon examination, a nontender, irreducible, oval-shaped cystic swelling, approximately 6x4 cm in size, was found in the region of the right inguinal area. Ultrasonographic examination, using high frequency linear transducer (9 to 18MHz), revealed a well defined, hourglass-shaped anechoic cystic swelling within the inguinal canal adjacent to the right common iliac artery, 6,5 x 4,3 x 3,1 cm in diameter, (Fig 1). The swelling exhibited features of a cyst with echogenic wall and single septation. No blood flow was detected in Color Doppler ultrasonography examination.

Colonic or ileal segments on inguino-labial area had no characteristic ultrasonographic appearance; therefore, inguinal and femoral hernias were ruled out as inguinal or femoral hernias usually have a hyper echoic component protruding out of the hernial orifice into the omental or intestinal sac. For detailed evaluation, CT and MRI examinations were performed. CT examination revealed a well defined cystic lesion, adjacent to vascular structures, in the right ilio-labial area. No connection was observed between the cyst and enteral structures including colon and ileum (Fig 2).

MRI was performed with a 3 T Magnetic resonance imaging system (Philips Medical Systems Intera, Germany). MRI revealed a lobulated contour, hour glass shaped cystic mass lesion in the right ilio-labial region, measuring compatible with other radiologic examinations. The cystic lesion was isointense with muscles in the T1-weighted images and hyperintense in T2- weighted images. Intestinal and/or

omental structures were not identified in the cystic mass (Fig 3-4). The cystic mass was excised under general anesthesia, and the inguinal region was explored, thereafter (Fig 5). Post-operative period was uneventful and the patient recovered satisfactorily. Pathologic examination confirmed our radiologic diagnosis of Hydrocoele of the canal of Nuck.

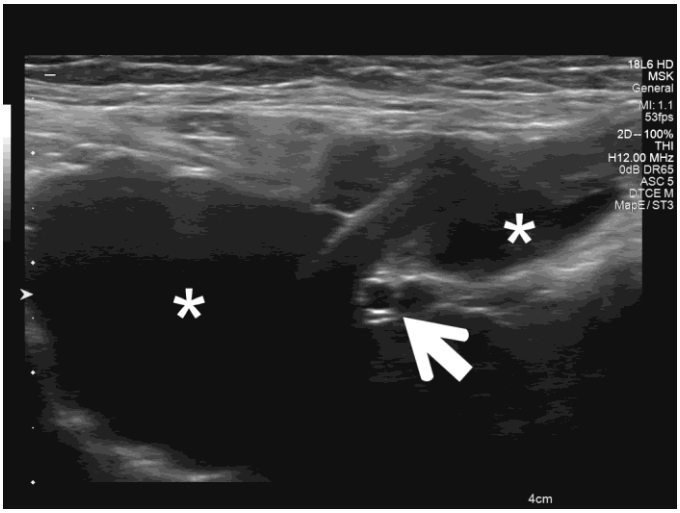

Fig-1: Ultrasonographic examination revealed a well-defined, hourglass-shaped anechoic cystic swelling (stars) within the inguinal canal adjacent to the right common iliac artery (arrow)

Fig-2: CT examination revealed a well defined cystic lesion, (arrow) in the right ilio-labial area. Any connection was not observed between the cyst and enteral structures

Fig-3: In MRI examination, the cystic lesion was isointense with muscles in the T1-weighted images (arrow)

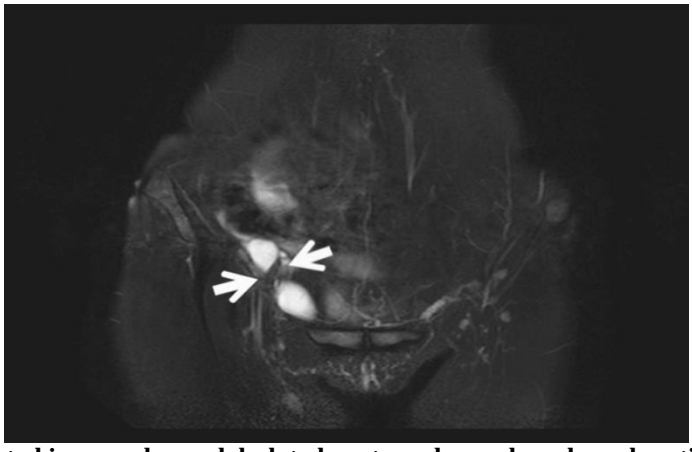

Fig-4: Coronal T2- weighted images show a lobulated contour, hour glass shaped cystic mass lesion in the right ilio-labial region, in MRI examination (arrow).

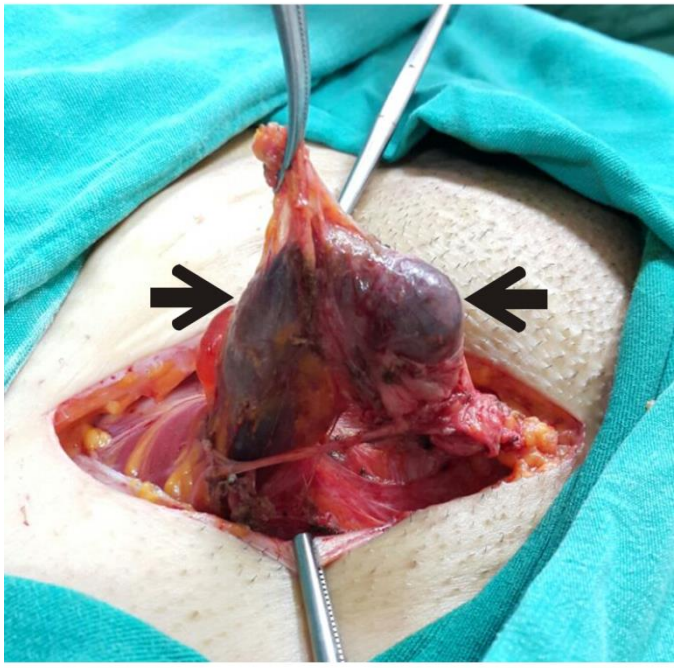

Fig-5: The cystic mass (arrows) was excised surgically, and the inguinal region was explored, pathologic examination confirmed our radiologic diagnosis of hydrocele of the canal of Nuck

DISCUSSION

In clinical practice, the hydrocele of the canal of nuck may be painless, fluctuating, nonreducible swelling in the inguino-labial area. The age of presentation is also variable as literature reveals [2]. Sometimes the cyst may be infected or tense, in which case it may present itself as a moderately painful swelling in the inguino-labial region [4,6]. Tenderness may be due to an imbalance between secretion and absorption of fluid by the mesothelial cell lining of the peritoneal fold [4]. Cysts are usually small, measuring about 3 cm in length and 3-5 mm in diameter; however, bigger hydroceles of canal of Nuck is also reported [5]. The Hydrocele of canal of Nuck is classified into three types:

Type I: It is the most common type of the Hydrocele of canal of Nuck. This type is an encysted hydrocele and there is no communication between peritoneal cavity and the cyst. It may be found anywhere along the course of the round ligament from the internal ring to the labia majora [3, 4].

Type II: This type is homologous to congenital hydrocele seen in males. There is a persistent communication between the peritoneal cavity and hydrocele [4].

Type III: In this type, there is an hour-glass appearance, the proximal part of the sac is retroperitoneal and the distal part of the sac is in the inguinal canal. This type simulates an inguinal hernia clinically [4].

Our case was typical of type I of the Hydrocele of canal of Nuck. Imaging methods, especially Ultrasonography

and MRI play important roles for diagnosing the hydrocele of the canal of Nuck [2]. Ultrasonography is often utilized as an initial imaging technique for detection of inguinal lesions [2, 6]. Ultrasonographic findings in this case study are summarized below [1,2,4,6]:

- Usually appearing as comma-mushroom-sausage, dumbbell shaped hypoechoic or anechoic unilocular cysts
- Rarely multilocular cystic mass with linear septa
- No vascularity with color Doppler Ultrasonography

Ultrasonography findings in our patient were typical the Hydrocele of canal of Nuck findings. It was dumbbell shaped, hypoechoic cyst with linear septa and there was no vascularity with color Doppler.

MRI findings are summarized below [1,4,6]:

- Thin- walled, well-defined, sausage-shaped cystic lesions in the hydrocele of the canal of Nuck.
- Low-signal intensities on the T1- and and high-signal intensities on T2-weighted images. For proper surgical planning, it is necessary to understand the extension of the cyst. MRI is an effective method to evaluate the extent of this condition [6]. MRI revealed detailed information about the mass and its adjacent structures. Thus, the operation was performed based on the radiologic diagnosis. The standart therapeutic approach is to surgically remove the cyst and to ligate the processus vaginalis peritonei [1]. In this case, cyst was surgically removed.

The Hydrocele of canal of Nuck is unfamiliar to physicians and not widely discussed in surgical and gynecologic textbooks [6]. The diagnosis of the hydrocele of canal of Nuck may be difficult on the basis of history and physical examination [3]. There are many differential diagnoses listed for inguinal masses in females [6]. The usual differential diagnosis of inguino-labial swelling in female patients are indirect inguinal or femoral hernia; buboes; Cysts (Bartholin's cyst,epidermal cyst, Gartner duct cyst); hematoma; abscess, lymphadenopathies, hydrocele of canal of nuck; tumors (lipoma, leiomyoma, and sarcoma); arterial and venous aneurysms and rarely cystic lymphangioma, ganglion; endometriosis of round ligament [2-6].

The final diagnosis was confirmed by histopathological examination [1]. There may be peritoneal fluid, bowel loops, omental fat, the fallopian tube, the ovary, or the urinary bladder in the hernial sac [1]. In female patients (especially in young ones), the hydrocele of canal of Nuck should also be considered as the differential diagnosis in a case of inguino-labial swelling. Since patient history and physical examination are not sufficient for the diagnosis of the hydrocele of canal of Nuck, radiological methods (ultrasonography, CT, and MRI) should be utilised in the diagnosis and followed by histopathology to confirm [2-4]. The treatment of choice for hydrocele of canal of Nuck is surgical excision [2,4].

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