

## Female hydrocele; forgotten differential in female inguino-labial swellings

Ahmed Elrouby\*; Mostafa Kotb

**\*Corresponding Author(s): Ahmed Elrouby**

Pediatric Surgery Department, Faculty of Medicine, Alexandria University, Egypt

Email: elroubypaedo@yahoo.com

### Abstract

**Objective:** Description of a rare case of 3 years old female patient presented with right inguinal hydrocele; its clinical presentation, diagnosis and treatment.

**Background:** The inguinal canal is traversed in males by the spermatic cord. However in females it's crossed by the round ligament which connects the uterine cornu with the ipsilateral labia majora. The round ligament is accompanied by a peritoneal pouch called canal of Nuck in utero simulating the processus vaginalis in males. Non obliteration of canal of Nuck results into female hernias and hydroceles just like the case of patent processus vaginalis in males.

**Case presentation:** This patient was presented to us on June 2016 by an irreducible right inguino-labial swelling appeared gradually one year ago, mobile from side to side with no-impulse on cough. Cross-fluctuation was detected during examination. Ultra-sonography showed a hypoechoic 3\*2 cm swelling with fine internal septations. Inguinal exploration was planned revealing encysted hydrocele of canal of Nuck. Hydrocelectomy with high transfixion ligation was done.

**Conclusion:** Although it's a rare congenital anomaly in females, it should be put in consideration while investigating a case of female inguino-labial swelling.

### Keywords

encysted hydrocele; canal of nuck; inguino-labial; swelling

### Introduction

Although their rare; canal of Nuck anomalies are considered an important cause of female morbidities which are usually underestimated and often missed in the differential diagnosis of inguino-labial swellings due to their rarity. Canal of Nuck is a parietal peritoneum protrusion accompanying the round ligament in inguinal canal in females which is spontaneously obliterated. Non obliteration leads to develo-

ment of female hernia and or hydrocele just like patent processus vaginalis in males [1].

Although physicians consider hydrocele as a male anomaly, it's present in females in rare occasions and because they usually don't put this diagnosis in mind; it's usually misdiagnosed as an irreducible hernia. So US is an excellent modality to differentiate between the two situations and guide further treatment [2].

Since few cases had been discussed in the literature about this topic; we present 3 years old female patient who was diagnosed clinically and confirmed by US to have right side hydrocele. We also reviewed the literature regarding this topic and discussed its clinical background.

## Case Presentation

A three years old female patient was referred to us with a right sided moderately painful irreducible inguino-labial swelling. Her parents claimed that the swelling was first noticed since one year being about 1×1 cm which gradually increased in size. They complained of recurrent inguinal pain with neither abdominal pain, change in bowel habit nor urinary symptoms. On local examination, there was an irreducible swelling about 3×3 cm, mobile from side to side, positive cross-fluctuation and positive trans-illumination. There was neither impulse on cough, thrill on cough nor bruit with normal skin overlying. From this clinical picture; the differential diagnosis of hernia or hydrocele was made (Figure 1).

Investigation revealed normal routine laboratory tests and the ultrasonography revealed hypo-echoic 3×2 cm swelling with fine internal septations. Surgical exploration was planned.

Right inguinal transverse incision was made and after dissection of the Scapa's and Camper's fasciae, a cystic swelling was detected, dissected and delivered through the wound (Figure 2).

Opening of the external oblique aponeurosis was done to follow the extension of the cyst which was clearly diagnosed as encysted hydrocele of canal of Nuck without any evidence of associated herniation. (Figure 3). The cyst was carefully dissected up to the deep inguinal ring and hydrocelectomy with high transfixion ligation of canal of Nuck was done. Layered closure of the wound was done with peaceful post-operative recovery and no recurrence in the last 12 months.

## Discussion

During embryological development of female fetus, the round ligament of uterus descends through the deep ring into the inguinal canal reaching the labia majora. An associated fold of the parietal peritoneum follows that and known as canal of Nuck. It was first described by Dutch anatomist, Anton Nuck in 1691 [3].

This canal usually obliterates at birth or early infancy. Incomplete obliteration leads to the development of hernia or hydrocele in females which is far less common than in males [4]. Huang et al. described in their study that the incidence of female hydrocele was about 1% [5].

Female hydrocele is mostly idiopathic developing due to imbalance between endothelial secretion and reabsorption in the canal of Nuck. However, secondary causes like impaired lymphatic drainage, trauma or inflammation may be the cause [2,6].

The pathological types of female hydrocele include type I which is the encysted hydrocele developing anywhere along the round ligament; this is the most common type. Type II which has a communication like male communicating hydrocele and type III which is the bilocular hydrocele having a constriction at the deep ring with an intra-abdominal retroperitoneal part and so it's reducible; this type simulates inguinal hernia [7].

Female hydrocele may be misdiagnosed as a congenital hernia because of its rarity, lack of clinicians' knowledge regarding this entity and paucity of the relevant literature in the surgical textbooks. Furthermore at least one third of these cases are associated with inguinal hernia [8].

Clinically it presents as an irreducible painless or slightly painful swelling due to sub-acute inflammation or tense consistency. The swelling may show positive trans-illumination however the overlying fat and aponeurosis may obscure this sign. The differential diagnosis includes indirect inguinal hernia, femoral hernia, Bartholin's cyst, post-traumatic hematoma, hydrocele of canal of Nuck, lipoma, vascular aneurysms, cystic lymphangioma, neuroblastoma metastasis in groin, ganglion, leiomyoma, sarcoma, endometriosis of round ligament and epidermal cyst [4].

High resolution ultrasonography can be helpful in the final diagnosis as the swelling appears as an anechoic or hypo-echoic sausage or coma shape superficial inguino-labial swelling medial to the pubic tubercle. MRI may be also helpful as it appears as hypo intense mass in T1 and hyper intense in T2 [8].

But finally the definitive diagnosis in almost all cases is confirmed by surgical exploration which is mandatory for all cases during which dissection of the hydrocele upto the deep ring is recommended with high transfixion ligation. The binocular hydrocele or type III and hydrocele associated with inguinal hernia could be managed by laparoscopy [9].

## Conclusion

Although it's rare; hydrocele of canal of Nuck should be considered in the differential diagnosis of female inguino-labial swellings. It should be diagnosed based on clinical examination and confirmed by high-resolution ultrasound or MRI. The treatment of choice in this condition is complete surgical excision.

Figures



Figure 1: The patient presented with right inguino-labial swelling



Figure 2: The cystic swelling delivered through the inguinal wound



Figure 3: The encysted hydrocele of canal of Nuck delivered out of wound

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**Authors Information:** Ahmed Elrouby\*; Mostafa Kotb  
Pediatric Surgery Department, Faculty of Medicine, Alexandria University, Egypt

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