

Hydrocele of the Canal of Nuck (Female Hydrocele): A Rare Differential for Inguino-Labial Swelling

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ABSTRACT

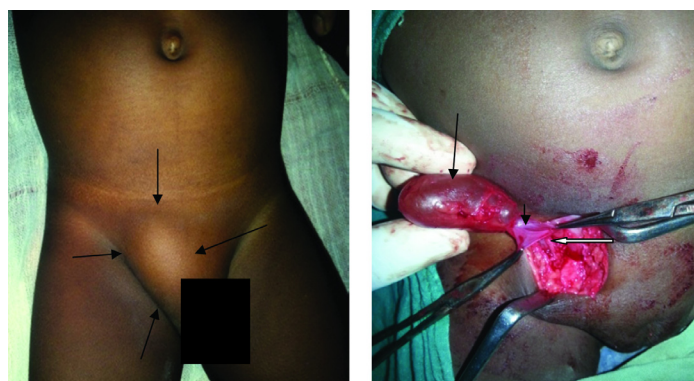
The inguinal canal is traversed by the spermatic cord in men and the round ligament of uterus in women. The round ligament is attached to the uterine cornu near the origin of fallopian tube at one end and to the ipsilateral labia majora at the other. The round ligament accompanies a pouch of parietal peritoneum in the inguinal canal, which is known as 'canal of nuck'. It is analogous to the processus vaginalis in males. Incomplete obliteration of the peritoneal pouch causes indirect inguinal hernia or hydrocele of the canal of nuck; a very rare condition in women. As these types of cases are rarely seen in surgical practice we present a case of such little-known developmental disorder in a three-year-old girl. She presented with irreducible, tender right inguino-labial swelling with tachycardia simulating incarcerated inguinal hernia, which necessitates emergency surgical exploration. On exploration it was found to be an encysted hydrocele of canal of nuck; so although rare, this entity should be considered in differential diagnosis in a female child presented with inguino-labial swelling.

Keywords: Encysted hydrocele, Processus vaginalis, Round ligament

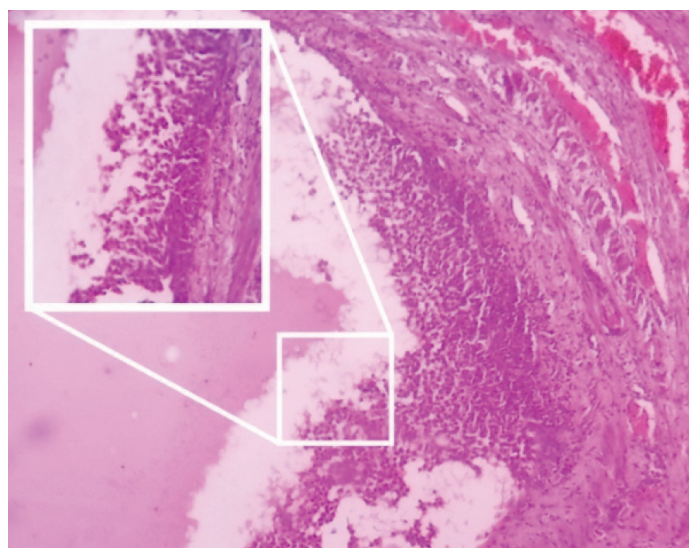
CASE REPORT

A three-year-old girl was referred to our surgery department from a rural hospital in West Bengal for a suspected incarcerated right-sided inguinal hernia in March '2014. Her mother had first noticed a peanut sized swelling in the right groin 6-months back; it gradually enlarged to reach the present size [Table/Fig-1]. Her parents sought medical attention because of moderate pain in her right groin for last 4-days. There were no complaints of abdominal pain, distension of abdomen or vomiting. The patient did not have any history of trauma to the right inguinal region. There was no change in her bowel and bladder habit in last four days. Local examination revealed a pear shaped 5 × 2.5 cm irreducible, fluctuant swelling in the right inguino-labial region. There was no expansile impulse on straining (crying). The swelling was transilluminant but no thrill or bruit was noted over the swelling. Overlying skin was normal and free from the groin lump. Her complete blood count and urinalysis was normal. A differential diagnosis of an inguinal hernia or hydrocele was made from the aforesaid clinical picture. Then the patient was shifted to our emergency operation theatre where ultrasonography of the right inguino-labial region revealed hypoechoic swelling with fine internal septations.

Then she underwent surgical exploration through right groin transverse skin crease incision, where after cutting the skin and



[Table/Fig-1]: Right inguino-labial swelling marked with black arrows.
[Table/Fig-2]: Surgical exploration; Cyst indicated by long black arrow (grasped between surgeon's fingers); peritoneal opening indicated by small black arrow and round ligament marked by white arrow.



[Table/Fig-3]: Cyst wall consisted of fibrous tissue x10, Inset: Mesothelial cells covering the inner surface x40; haematoxylin & Eosin stain

subcutaneous tissue we encountered a cystic lesion. Then we open the right inguinal canal after cutting the external oblique aponeurosis to delineate the extension of the lesion. Cyst was extended down to the right labia majora and it was clearly seen to be an encysted hydrocele of canal of the nuck [Table/Fig-2], without any evidence of associated inguinal hernia. The cyst was carefully dissected from the round ligament and ligation of canal of nuck done near deep inguinal ring and the wound closed in layers. The histopathological findings of the cyst wall showed that the cyst chiefly comprising vascularised fibrous tissue and flattened mesothelial cells lining the inner surface [Table/Fig-3].

Post-operative period was uneventful and there was no evidence of recurrence in last 16 months of follow-up.

DISCUSSION

During embryological development of a female fetus, round ligament of the uterus descends down to the ipsilateral labia majora through the inguinal canal. A peritoneal fold also descends along with the round ligament, which is known as canal of nuck.

It was first described by Dutch anatomist, Anton Nuck in 1691. It usually gets obliterated by birth or during early infancy but if this communication remains patent, it may lead to development of an indirect inguinal hernia or hydrocele. In surgical practice, congenital hydrocele or hernia cases are usually seen in a male child and it is uncommon in female [1-3]. Enlargement of the cyst with associated tenderness as seen in our case may be due to imbalance between secretion and absorption of fluid by the mesothelial cell lining of the peritoneal fold. It is idiopathic in most of the cases albeit some cases may also be due to impairment of lymphatic drainage, trauma or inflammation [4,5]. Huang et al., reported that the incidence of the hydrocele of the canal of Nuck in female child was 1% (only 6 cases out of 580 female inguinal hernia cases admitted in Chang Gung Children's Hospital, Taiwan from 1997 to 2002). An extensive search of English medical databases, using key word hydrocele of canal of nuck revealed some interesting isolated case reports including few case reports from Indian subcontinent also, but its incidence in adult female is not clear perhaps due to its rarity [6].

The Hydrocele of canal of Nuck is classified into three types: (I) The most common type is the encysted type where there is no communication of the hydrocele with the peritoneal cavity and the cyst may be found anywhere along the course of the round ligament from the deep ring to the labia majora. Our case was type I variety; (II) The Second type is similar to congenital hydrocele seen in male where there is a persistent communication between hydrocele and the peritoneal cavity; (III) In third variety there is a constriction at the deep ring like an hour-glass, so that the proximal part of the sac is retroperitoneal and the distal portion of the sac is in the inguinal canal and clinically simulates an inguinal hernia [7,8]. Hydrocele of canal of nuck may be misdiagnosed as inguinal hernia because of its rarity, lack of clinician's knowledge regarding this entity and paucity of the relevant literature in the surgical textbooks; furthermore at least one third of the cases are associated with inguinal hernia [9,10]. Clinically it presents as a painless or moderately painful (when tense cystic or infected), translucent, irreducible lump in the inguino-labial region [11]. However, the overlying fascia and thick aponeurosis of the external oblique muscle may not allow transilluminate in older patients. High index of suspicion is essential to make a provisional diagnosis. The usual differential diagnosis of inguino-labial swelling in a female patients are indirect inguinal hernia or femoral hernia; buboes; Bartholin's cyst; post-traumatic hematoma; hydrocele of canal of nuck; lipoma; vascular aneurysms and rarely cystic lymphangioma, neuroblastoma metastasis in groin; ganglion; leiomyoma; sarcoma; endometriosis of round ligament or epidermal cyst [12,13].

To establish a definitive diagnosis only by history and clinical examination is challenging. Imaging studies may help in pre-operative diagnosis but most of the cases of hydrocele of canal of nuck finally diagnosed on surgical exploration. Radiological confirmation can be done by high-resolution ultrasonography or MRI scan. The usual sonography findings are an anechoic or hypoechoic, sausage or comma-shaped mass lying superficially in groin and medial to the pubic bone at the level of superficial inguinal ring and avascular on colour Doppler study. MRI findings of this entity includes well-defined, thin-walled, sausage shaped cystic lesion, which is hypointense on T1 and hyperintense on

T2 - weighted images [10,14,15]. Surgery is necessary for final diagnosis and treatment and considering common association with indirect inguinal hernia, dissection must be done up to the deep inguinal ring along with high ligation of the neck of the peritoneal pouch [16,17]. Hydrocele of canal of nuck with associated inguinal hernia and type III cysts can also be managed by laparoscopic approach [18,19].

CONCLUSION

A hydrocele of the canal of nuck, although rare, it should be considered in the differential diagnosis in a case of inguino-labial swelling. Diagnosis may not be possible only on physical examination; hence, further evaluation with high-resolution ultrasound or MRI scan imaging will be helpful to reach a definitive diagnosis preoperatively. The treatment of choice for hydrocele of canal of Nuck is complete surgical excision.

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