

Case Series

Cyst of canal of Nuck-a rare clinical entity: case series and review of literature

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ABSTRACT

A small evagination of parietal peritoneum forms the canal of Nuck. By the first year of life this extension condenses into a fibrous cord. Cyst of canal of Nuck is a rare developmental anomaly. The inguinal canal is traversed by the spermatic cord in male and the round ligament of uterus in female. The processus vaginalis accompanies the round ligament through the inguinal canal through into the labium majus. This evagination of parietal peritoneum forms the canal of Nuck in the female. These cases are rarely seen in surgical practice. In this case series we described three clinical scenario of canal of Nuck and their management.

Keywords: Canal of Nuck, Inguinal cyst, Round ligament, Inguinal swelling, Female hydrocele, Processus vaginalis, Abdominolabial cyst (hydrocele)

INTRODUCTION

Cyst of canal of Nuck was described by Dutch anatomist Anton Nuck in 1691. The round ligament in female is attached to the uterine cornu at one end and to the vulva at the other, traversing through inguinal canal. A small evagination of parietal peritoneum forms the canal of Nuck. By the first year of life this extension condenses into a fibrous cord.¹ The inguinal canal is traversed by the spermatic cord in male and the round ligament of uterus in female.² This evagination of parietal peritoneum forms the canal of Nuck in the female.³ A small evagination of parietal peritoneum accompanies the ligament throughout the course is known as cyst of canal of Nuck.⁴ The canal of Nuck normally loses its connection with the parietal peritoneum during the first year of life.

There are three types of hydrocele of canal of Nuck. The most common type is one with no communication with the peritoneal cavity, forming an encysted hydrocele along the tract of descent from the inguinal ring to the vulva. The second type results when there is a persistent communication with the peritoneal cavity. The third type is a combination of the two as a result of the inguinal ring constricting the hydrocele like a belt, so that a part is communicating and a part is enclosed, giving this the name of hourglass type.

However, any of these types of hydroceles is extremely rare in females. Variants of the typical hourglass lesion include a bilocular hydrocele formed due to obliteration of the constricted segment at the internal inguinal ring.⁴ If these extension fails to condense the abdominal fluid or viscera may get enter into the inguinal canal resulting in hydrocele or hernia.

CASE SERIES

Case 1

A 38 year old female came with complaints of swelling in right inguinal region since 6 months. Swelling was irreducible in nature and size did not change on standing or lying down position. There was no history of any local trauma. Menstrual and obstetric history was unremarkable.

On examination, swelling of size 5×3 cm was noted in right inguinal region which was cystic in nature. An irreducible mass extending up to labia majus was palpable. Patients general condition was fair and laboratory investigations were within normal limits. Ultrasonography revealed cystic, septated focal lesion in right adnexa and iliac fossa. Possible causes as tubo-ovarian mass, intraperitoneal loculated collection with small intramural fibroid in uterine fundus was suggested. The CT scan imaging was done which revealed the finding of hydrocele of canal of Nuck.



Figure 1: Clinical photograph showing right sided irreducible mass extending up to labia majora (hydrocele of canal of Nuck).

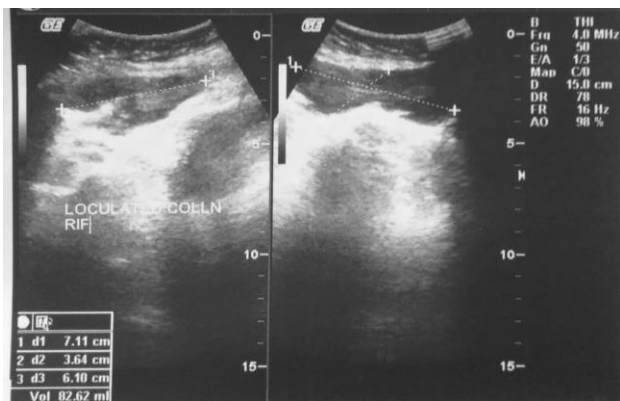


Figure 2: Ultrasonography image showing right sided swelling extending up to labia majora (loculated collection/hydrocele of canal of Nuck).

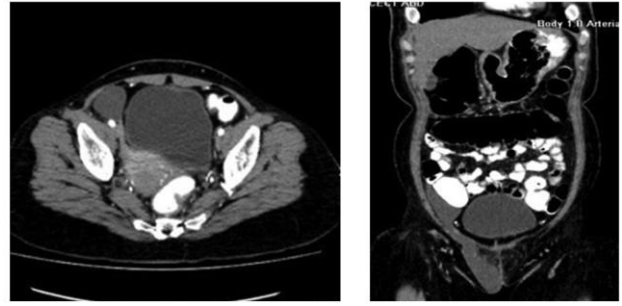


Figure 3: CT image of right sided hydrocele of canal of Nuck.

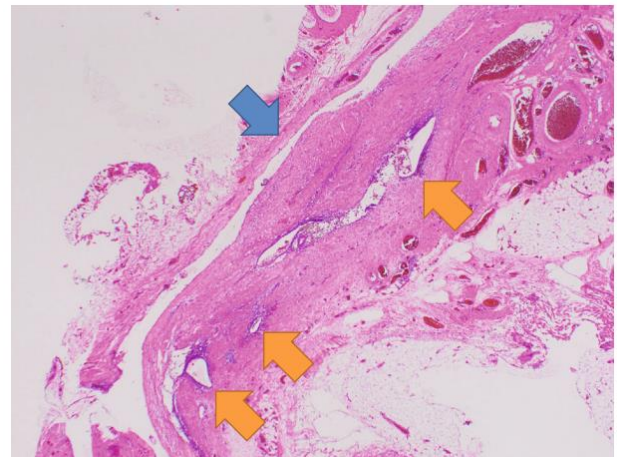


Figure 4: Histopathological image showing foci of endometriosis (orange arrows) and lined cyst wall (blue arrow).⁸

On inguinal exploration, a tense cystic swelling was found adherent to the round ligament. It was excised after careful dissection. The cyst contained straw colored fluid. Histopathological examination reported a loculated cystic wall without any secretory epithelium.

Case 2

A 29 year old female presented with a swelling in her right groin which had been gradually growing in size since 6 months. There was no alteration in size of lump during menses or on lying supine. Obstetrical and menstrual history was unremarkable.

On local examination, a 4×3 cm irreducible mass in right inguinal region extending to upper part of labium majus was palpable. Mass was firm, mobile, non-tender in nature. There was no alteration of size on Valsalva maneuver.

Ultrasonography revealed a well-defined hypoechoic lesion with internal echoes. On exploration from inguinal region, a firm sub-aponeurotic lump continuous with round ligament was found. On dissecting the lump, its interior revealed several small loculi containing scanty

yellowish-brown fluid. Proximally, the lumen was occluding and merging with round ligament. The lump was excised en-block and subjected for histopathological examination. Histopathological examination demonstrated a loculated cyst of canal of Nuck with deposition of secretory endometrial tissue.

Case 3

A 32 year old female presented with complaints of swelling in right inguinal region for 2 years. The swelling was gradually increasing in size and reducible on lying down. No complaints of pain over the swelling. No history of any abdominal pain, distension of abdomen or vomiting. On general examination vitals were stable.

Local examination revealed a single, soft and non-tender swelling of size 6×4 cm in the right inguinal region extending up to the labia majora with regular margins. Swelling was reducible cough impulse was present and overlying skin was normal in color and texture. Routine hematological examinations were within normal range.

Ultrasonography suggested an ill-defined anechoic lesion of size 2.9×5.9×3.5 cm in right iliac fossa extending up to mons pubis. CECT scan of abdomen and pelvis was suggestive of thin walled, loculated and cystic lesion with an approximate volume of 128 cc in the right inguinal region, extending inferiorly up to mons pubis and superiorly into the retroperitoneum up to the right iliac fossa. Provisional diagnosis was right sided inguinal hernia was kept. Final diagnosis of hydrocele of canal of Nuck was done based on CT findings.

Surgical exploration through the right inguinal incision showed the presence of a thin-walled sac containing clear fluid. It was extending up to mons pubis. Complete sac excision was done and the cyst was separated from the surrounding round ligament. Histopathological examination revealed a cystic structure lined by cuboidal epithelium with fibro connective tissue with secretory epithelium (endometrial) and mixed inflammatory infiltrates.

Postoperative period was uneventful in all the three cases. Patients were followed up to six months and there were no short-term surgical complications. There was no evidence of pain or recurring swelling in the groin region.

DISCUSSION

Hydrocele of canal of Nuck is a rare entity in females. Hydrocele of canal of Nuck typically presents as a painless, translucent swelling in the inguinolabial region. There is no nausea or vomiting. If possible, the child should be examined in supine and standing position.

In older children, Valsalva's maneuver should be performed to rule out hernia.⁵ The cyst formation is due to the imbalance in secretion and absorption from the

secretory membrane lining the processus vaginalis. When the peritoneal evagination remains completely patent or partial proximal obliteration, which leaves the distal portion of the processus vaginalis open, forms the hydrocele of the canal of Nuck. For hernias of the canal of Nuck bowel, omentum, fluid, urinary bladder, ovary, fallopian tube, abscesses, vascular abnormalities and rarely endometrium can herniate into the inguinal canal. In endometriosis, the canal provides the most likely pathway of endometrial tissue to implant into inguinal canal. Also extra pelvic endometriosis that is distant to uterus tends to lose its hormonal receptor and response, hence the lack of clinical symptoms.¹

In our case series, we had a case of endometriosis in cyst of canal of Nuck. The differential diagnosis of a cystic mass in the female groin region includes round ligament cysts, varicosities of the round ligament, inguinal herniation of the ovary, cystic lymphangiomas, epidermal inclusion cysts, abscesses and pseudo aneurysm.⁵

In literature, sonographic appearance of hydrocele of canal of Nuck shows thin-walled, well-defined, echo-free, cystic structure varying from anechoic, tubular sausage, dumbbell or comma shaped and cyst within cyst appearance to a multicystic appearance. MRI and CT scan may be used as an investigation for diagnosis. The MRI findings of canal of Nuck hydroceles have been reported for a few patients in which hydrocele appeared as a thin-walled, tense cystic mass in the inguinal area. A hydrocele of the canal of Nuck has low intensity in T1-weighted images and high intensity in T2-weighted images.²

In this case series, CT scan findings are suggestive of a thin-walled, cystic density lesion in the right inguinal region, extending inferiorly up to mons pubic and superiorly into peritoneal cavity up to the right iliac fossa. Once the diagnosis is confirmed surgical excision is only treatment of choice by open method or laparoscopy method.^{6,7}

CONCLUSION

Cyst of canal of Nuck is a rare clinical entity. A cyst (hydrocele) of the canal of Nuck though should be considered in differential diagnosis in females presenting with an inguinal swelling. Radiological investigation (CT scan, MRI and USG) can give diagnosis followed by surgical exploration and histopathological examination.

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