



Hydrocele of the Canal of Nuck

Neshanth Easwaralingam*

Nepean Hospital, Australia

Abstract

Hydrocele of the canal of nuck is a rare condition in females of which there are approximately 500 cases in the known literature. It is caused by incomplete obliteration of the processus vaginalis peritonei, a tubular fold of peritoneum that invaginate the inguinal canal anterior to the gubernaculum and is analogous to the tunica vaginalis testis in the male. Commonly if the processus remains patent, it forms a pathway for an indirect inguinal hernia. However, if it is partially obliterated proximally, an encysted hydrocele can result. Herein we report the case of a hydrocele in a 26-year-old female presenting with an intermittent right groin lump. Differentials included a femoral hernia, inguinal lymphadenopathy, epidermal cyst or tumour (sarcoma, lipoma, leiomyoma). Ultrasound examination demonstrated a 6 cm dumb bell shaped anechoic structure with its waist at the superficial ring, consistent with a hydrocele. The diagnosis was subsequently confirmed on surgical exploration.

Keywords: Canal of nuck; Processus vaginalis; Female hydrocele

Introduction

Hydrocele of the canal of nuck is a rare condition in females caused by incomplete obliteration of the processus vaginalis. The processus vaginalis is a tubular fold extending from the parietal peritoneum that invaginate the inguinal canal anterior to the gubernaculum. It is analogous to the tunica vaginalis testis in the male and if it remains completely patent, it forms a pathway for an indirect inguinal hernia [1]. If it becomes partially obliterated proximally, an encysted hydrocele of the canal of nuck may result. Its name sake Anton Nuck was a 17th century Dutch anatomist who described the condition in 1691 [2].

Case Report

A 26-year-old female with a history significant for polycystic ovarian syndrome presented with intermittent right groin swelling for two weeks associated with mild discomfort. On examination there was a small irreducible tender swelling below and lateral to the right pubic tubercle. The swelling was neither fluctuant nor translucent. No cough impulse was appreciated. Differential diagnoses included a femoral hernia, saphena varix, inguinal lymph node, epidermal cyst or tumour (lipoma, leiomyoma, sarcoma).

Ultrasound examination of the groin was performed to avoid a potentially unnecessary surgical intervention. This demonstrated a 6 × 3 × 2 cm cystic structure commencing in the inguinal canal and extending below the superficial ring potentially consistent with an encysted hydrocele of the canal of nuck (Figure 1). Subsequent surgical exploration demonstrated a sac like fluid filled structure emanating from the superficial ring. The external oblique aponeurosis was incised at the superficial ring to liberate the hydrocele which was ligated and then resected. Both the ilioinguinal nerve and the round ligament were ligated and resected over a length of 4 cm prior to a polypropylene mesh repair of the inguinal canal (Figure 2). The patient had an unremarkable post-operative course.

Discussion

Cystic groin swellings are exceedingly rare in females of which hydrocele of the canal of nuck is an even rarer subset. An extensive search of Medline, Pubmed, Embase and Cochrane library databases using keywords 'female hydrocele' and 'hydrocele of canal of nuck' revealed very little about this entity in the literature. In 1941 Counsellor and Black presented a series of 17 cases from the Mayo Clinic and reported approximately 350 cases in the literature to date at that time [3]. Since then our search identified 155 cases in the literature including 68 individual case reports with the largest series comprising 26 patients by Lee in 2017 [4]. Patient ages ranged from 6 days to 69 years old at the time of presentation.

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*Correspondence:

Neshanth Easwaralingam, Nepean Hospital, Westmead, New South Wales, Australia,

E-mail: neshanth@bigpond.net.au

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Figure 1: Ultrasonography of right inguinal canal demonstrating 6cm long well defined cystic structure lacking internal echoes. No evidence of bowel or omental herniation was noted during the examination.

Endometriosis and angiofibroma within the canal of nuck have been described [5]. Other rarer entities such as hydroceles associated with ventriculoperitoneal shunts, bilateral female hydroceles, infected hydroceles and haematoma in a hydrocele have also been reported [6-8].

During embryological development the round ligament is accompanied by the processus vaginalis which usually obliterates in the first year of life. Ongoing patency of the processus can lead to an indirect inguinal hernia or hydrocele of the canal of nuck of which there are 3 types:

- Encysted hydrocele with no communication with the peritoneal cavity
- Hydrocele with persistent communication with the peritoneal cavity and
- Hour glass hydrocele which results from constriction at the deep inguinal ring such that part is communicating and part is closed [3].

In general hydroceles result from an imbalance between secretion and absorption of this peritoneal lining along the course of the round ligament. Although the exact aetiology of the imbalance remains unclear various hypotheses include trauma, inflammation and impaired lymphatic drainage [9].

A classical presentation is of a painless translucent irreducible mass extending into the inguino-labial region. There may be pain associated with tense distension or in the setting of infection or haematoma complicating the cyst. Clinically hydroceles may or may not transilluminate depending on the thickness of the overlying fascia and external oblique aponeurosis. Ultrasound typically demonstrates a thin walled, well defined hypoechoic unilocular or multilocular structure, showing no change on Valsalva and no increased Doppler signal intensity. However both the presentation and imaging findings can vary, with surgery remaining integral to the diagnosis.

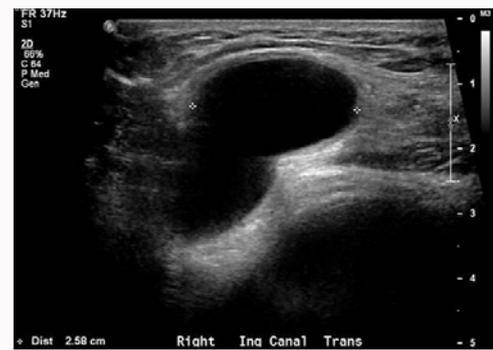


Figure 2: Transverse sonographic image of right inguinal demonstrating dumbbell shaped anechoic cystic structure with a waist at its exit point from the superficial ring. The superficial component is 2.58cm in diameter and dissects the subcutaneous tissues inferiorly.

Hydrocele of the canal of nuck is a rare but important cause of inguinal swelling in adult females with our study estimating approximately 505 cases in the literature to date. It should remain part of the differential diagnosis despite the paucity of literature describing its existence. Ultrasound is a useful tool in delineation, however definitive diagnosis and treatment is only achieved *via* surgical exploration.

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