CASE REPORT

Hydrocele of the canal of Nuck presenting as a sausage-shaped mass

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SUMMARY

A 23-year-old woman presented with a painless vulval swelling. On physical examination, a soft fluctuant sausage-shaped mass was found, measuring approximately 4 cm, extending from the right inguinal region to the labia majora. Ultrasound revealed a well-defined hypoechoic elongated mass, septated, extending from the superficial inguinal canal to labia majora. Sonographic findings were consistent with the diagnosis of a hydrocele of the canal of Nuck. Surgical exploration revealed an elongated cystic lesion with a total length of 13 cm, mucous component and internal septations. Histopathological examination of the surgical specimen confirmed the suspected diagnosis.

BACKGROUND

Hydrocele of the canal of Nuck is a rare developmental disorder in females and occurs mostly in paediatric age, although there have been a few reports of this pathology in adults. Wei *et al* reported one case in an adult woman in 2001 and, from their review of the literature, there have been about 400 reported case.¹ Since then, 42 cases have been reported, 17 of which were in adult women.^{2–18}

The maturing ovaries descend to the ovarian fossae by the third month of embryonic development, guided by a peritoneal fold, named gubernaculum. The gubernaculum connects the ovary to the uterus and forms the ovarian and the round ligaments. The round ligament passes through the internal ring, inguinal ring and external ring and then attaches to the abdominal wall muscles.

This evagination of the parietal peritoneum is the canal of Nuck, analogous of the processus vaginalis in the male.¹⁹ During the first year of life, it is expected that this peritoneal evagination obliterates.⁵ However, if it remains patent, forms a pouch of peritoneum in the labia majora. Depending on the degree and location of the obliteration, three types of hydrocele of the canal of Nuck have been described⁸:

1. Obliteration proximal to the deep inguinal ring with absent communication with the peritoneal cavity, which can lead to the development of an encysted hydrocele from the inguinal ring to the vulva (figure 1) is the most common type.
2. Persistent communication with the peritoneal cavity, originating a congenital hydrocele or an inguinal hernia, which may be present in about 30%–40%¹³ is the herniated ovary have been reported.⁵
3. An association of the above, with partial communication between the peritoneal cavity and the sac, resulting in an hourglass type of sac.³

Hydrocele can emerge either because there is a leakage from the peritoneal fluid or due to hypersecretion or under absorption in the lining epithelium of the distal segment. The aetiologies in support of this pathology include trauma, inflammation, impairment of lymphatic drainage, endometriosis and idiopathic.⁹

Clinical presentation of this entity is usually a groin lump or a vulval swelling. Differential diagnosis includes inguinal or femoral hernias, Bartholin's cyst or abscess, lipoma, lymphadenopathy, femoral neuromas, saphena varix.^{3 13}

We present a case of a hydrocele of the canal of Nuck with an uncommon appearance, describing and illustrating the clinical and investigation details. With this report, we aim to provide important clinical information of a little-known disorder to help physicians on their clinical practice.

CASE PRESENTATION

A 23-year-old woman was referred to our gynaecological emergency department with the diagnosis of a Bartholin's cyst. The patient presented with a painless vulval swelling, which she had noticed 4 months before and gradually became conspicuous. She had no other symptoms and defaecation and micturition were both normal.

On physical examination, a soft fluctuant sausage-shaped mass was found, measuring approximately 4 cm, extending from the right inguinal

Figure 1 Illustration of the canal of Nuck.

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Figure 2 Swelling of the right labia majora.

region to the labia majora (figure 2). There were no signs of infection or inflammation and the overlying skin had no lesions. The mass was not reducible and did not change its size or shape

Figure 3 Longitudinal ultrasonographic image using high frequency transvaginal transducer (5–12 MHz), showing a well-defined hypoechoic elongated cyst with 5.5 cm of long axis with septations.

Figure 4 Intraoperative photograph. Surgery revealed a cystic lesion with mucous component and a smooth internal surface with septations.

with Valsalva manoeuvre. The patient was observed in both standing and supine positions and there were no differences in the size and shape of the mass. Clinical findings were intriguing and a final diagnosis could not be made. An appointment in our department was scheduled to clarify the diagnosis. Two months later, the clinical findings were the same and a cyst of the canal of Nuck was then suspected.

Ultrasound revealed a well-defined hypoechoic elongated mass with 5.5 cm of long axis, septated, extending from the superficial inguinal canal to labia majora (figure 3). Ultrasound from uterus and adnexa was normal. Sonographic findings were consistent with the diagnosis of a hydrocele of the canal of Nuck and treatment choices were discussed with the patient. She opted for surgical excision to avoid the possibility of a recurrence associated with aspiration treatment.

Surgical exploration through a small incision over the lump revealed an elongated cystic lesion with mucous component and internal septations (figure 4), extending from the superficial inguinal ring to the right labia majora, through all its extension. Surgical excision was done with cosmetic correction of the vulva. The surgical specimen had a brownish ground glass appearance and a total length of 13 cm and a medium width of 1 cm.

OUTCOME AND FOLLOW-UP

Histopathological examination of the surgical specimen confirmed the suspected diagnosis (figure 5).

DISCUSSION

Hydrocele of the canal of Nuck is seldom mentioned in comprehensive surgical and gynaecological textbooks and it remains an unfamiliar problem for physicians. Some cases are preoperatively misdiagnosed as inguinal hernias and Bartholin cysts or abscesses,³ which are the leading causes for differential diagnostic.

Figure 5 Microscopic aspect of the lesion. (A) The cyst was lined with a single layer of flat cells, without atypia. Underlying this layer was a dense collagenous fibrous tissue and a thin band of inflammatory cells, mostly histiocytic cells (H&E 400×). (B) Mesothelium origin of the cells covering the cyst was confirmed by negative immunostaining with BerEp4 (BerEp4 400×).

Our case had a typical clinical presentation, a painless irreducible swelling, usually with 3–4 cm. Ultrasound findings were also similar to the cases reported in literature, an anechoic or hypoechoic well-defined mass, comma or sausage shaped. In several of the reported cases, like in ours, cysts had internal septations, which had been speculated to represent remnants of a futile attempt by nature at obliteration.¹⁷

Despite the typical clinical presentation of our case, the cyst contained a yellowish-mucous fluid, instead of the serous fluid mentioned by other authors.^{3 17 20} The inner surface of the cyst was covered with mesothelial cells and inflammatory cells, predominantly histiocytes. The viscous appearance of the fluid could result from an increased secretion of glycoproteins (like hyaluronan) by mesothelial cells, induced by inflammatory cytokines.

We consider that hydrocele of the canal of Nuck, although uncommon, is a relevant cause of vulval swelling in an adult woman, corresponding to 5%–12%,⁵ and it is important for all physicians, particularly gynaecologists, to be familiarised with this pathological entity.

Learning points

- ▶ Atypical inguinal hernias and Bartholin cysts or abscesses should raise the suspicion of a hydrocele of the canal of Nuck.
- ▶ Ultrasonography is an accurate modality for differentiating hydrocele of the canal of Nuck from other entities.
- ▶ The treatment of choice is surgical excision of the mass because aspiration results in recurrence.

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