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Inguino-labial mass in a female newborn: A rare case of canal of nuck hydrocele presenting at birth

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Abstract

Background: Hydrocele of the canal of Nuck is a rare developmental anomaly resulting from incomplete obliteration of the processus vaginalis in females. Although commonly reported in infants and young children, its presentation in the immediate neonatal period, particularly on the first day of life, is exceedingly rare. This case highlights the importance of recognizing this benign entity early, especially when it clinically mimics more urgent surgical conditions such as incarcerated ovarian hernia. It contributes to the limited neonatal literature and reinforces the role of ultrasonography in early diagnosis.

Clinical description: A term female neonate was noted to have a right inguino-labial cystic swelling on day one of life. The swelling was soft, non-tender, fluctuant, non-reducible, and transilluminant. There were no systemic signs of distress. Ultrasonography revealed a well-defined, anechoic, multiloculated lesion extending from the inguinal canal to the labia majora, with no evidence of solid contents or peritoneal communication. Based on the sonographic features, a diagnosis of encysted hydrocele of the canal of Nuck was made. Pediatric surgical evaluation confirmed the diagnosis, and the neonate was scheduled for elective repair. No emergent intervention was required.

Conclusion: Inguino-labial swelling in female neonates warrant timely imaging to differentiate benign conditions from surgical emergencies. Awareness of hydrocele of the canal of Nuck, although rare at birth, is essential to avoid unnecessary interventions and ensure appropriate follow-up.

Keywords: Inguinal mass; Canal of Nuck; Congenital hydrocele; Anechoic lesion.

Introduction

Hydrocele of the canal of Nuck is a rare condition resulting from the incomplete obliteration of the canal of Nuck, the female counterpart of the processus vaginalis in males. It often presents as a painless inguinal or inguino-labial swelling, which can be easily mistaken for an inguinal hernia. Early recognition is crucial to avoid missing medical emergencies such as strangulated/incarcerated hernia and ovarian torsion.

Clinical description

A female neonate, born at 39 weeks of gestation via vaginal delivery to a primigravida mother, weighed 2586 grams at birth and had an uneventful perinatal history, with no maternal medical or obstetric complications. On initial physical examination at birth, a 3.5 x 2 cm swelling was observed in the right inguinal region (Figure 1a), extending to involve the right labia majora. The mass was soft to firm, non-tender, non-erythem-

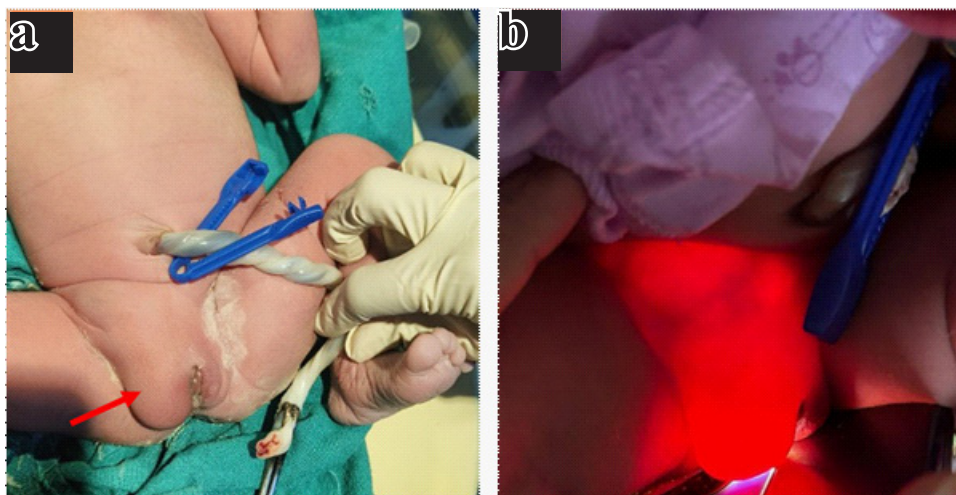


Figure 1: (a) Clinical image showing a soft, non-tender right inguinal mass (red arrow) in a newborn female. (b) Transillumination test demonstrating a positive result in a newborn with Canal of Nuck hydrocele. The scrotal/inguinal swelling appears brilliantly illuminated, indicating the presence of fluid within the sac.

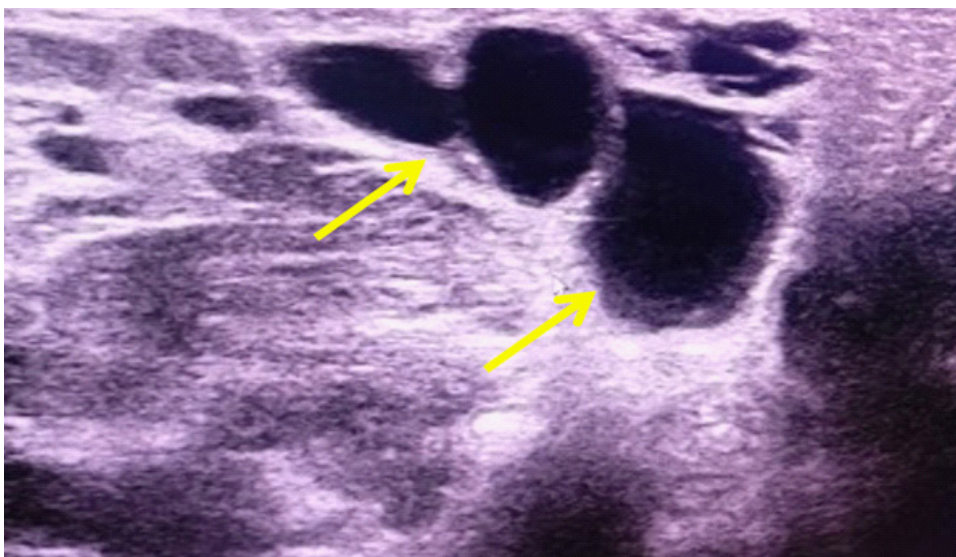


Figure 1: Ultrasound of the inguinal region showing a multiloculated anechoic cystic lesion (yellow arrows), consistent with a hydrocele of the Canal of Nuck.

atous, non-reducible, fluctuant, with positive transillumination (Figure 1b), without any associated signs such as constipation, or crying upon palpation. Ultrasonographic assessment of the local region revealed a multiloculated, trans-spatial cystic lesion extending from the right inguinal region to the right labia majora, measuring approximately 6 x 1.3 cm, with no definitive communication with the peritoneal cavity. There was no solid component within the lesion (Figure 2). The uterus and ovaries were visualised in their normal anatomical position. The ultrasonography findings were indicative of an encysted hydrocele of the canal of Nuck on the right side. A pediatric surgical consultation was obtained, with the decision to undergo surgical intervention at follow-up visits.

Discussion

We report a case of neonatal onset hydrocele of the canal of Nuck, seen as an unilateral inguinal mass at birth. The canal of Nuck is a small evagination of the parietal peritoneum which is formed when the round ligament goes through the inguinal canal to attach to the labia majora during fetal development.

It is the female equivalent of the processus vaginalis in males, first described by Anton Nuck in the year 1691 [1,2]. While most documented cases occur in infants and young children, a recent systematic review by Kochis et al. identified only 105 reported pediatric cases in the literature—most presenting after the neonatal period, underscoring the rarity of our case [3,4].

Usually, the canal obliterates during the first year of life. If closure is completely absent, it may lead to an indirect inguinal hernia or communicating hydrocele, presenting as a painless inguinal or labial swelling. In female children, the hernial content may have ovaries and fallopian tube, which increases the risk of torsion, strangulation or incarceration – complications which require urgent medical and surgical intervention [3]. Partial closure in turn leads to an encysted hydrocele [1,2,5,6].

Hydrocele of the canal of Nuck, though rare at birth, should be considered in the differential diagnosis of inguino-labial swelling alongside inguinal hernia (particularly ovarian herniation), lymphadenitis, abscess, Bartholin's cyst, and soft tissue tumors [7,8]. Hydroceles typically present as non-reducible,

transilluminant, painless, cystic masses. In contrast, hernias are often reducible and may contain bowel or omentum with visible peristalsis or bowel sounds. A well-defined, anechoic, non-tender lesion on ultrasound is characteristic of a Type 1 (encysted) canal of Nuck hydrocele [6].

An incarcerated ovarian hernia—a neonatal surgical emergency—may mimic hydrocele but generally lacks transillumination, may be tender, and reveals a solid intra-sac structure with absent vascularity on doppler. Herniated ovaries are particularly prone to incarceration (up to 43%) and torsion, both requiring early surgical management even in the absence of overt signs of strangulation [8,10]. In our case, early imaging confirmed a simple cystic lesion without intra-abdominal continuity or solid components, permitting conservative management and elective surgical follow-up [7,8].

This underscores the importance of timely high-resolution ultrasound, ideally with doppler, in evaluating non-reducible groin masses to assess for vascular compromise or strangulation [9]. Notably, local signs of inflammation may be absent even in strangulated or incarcerated cases, further emphasizing the need for prompt imaging to guide accurate diagnosis and intervention [11].

Although hydrocele of the canal of Nuck is more commonly reported in infants and young girls, its occurrence in the immediate neonatal period—particularly on the first day of life—is rare. The distinctive clinical presentation and imaging findings in this case highlight the importance of including this condition in the differential diagnosis of inguino-labial swelling in neonates and adds to the existing literature.

Lessons learnt

1. Hydrocele of the canal of Nuck is a rare but important differential diagnosis in newborn females presenting with inguino-labial swelling.

2. It can closely mimic urgent surgical conditions like an incarcerated ovarian hernia, requiring careful differentiation.

3. High-resolution ultrasound is crucial for confirming the diagnosis and ruling out solid or herniated intra-abdominal contents.

Declarations

Funding: No funds were required for this case.

Competing interest: The authors declare that they have no competing interests.

Informed consent: Written informed consent has been taken from the parents of the neonate.

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