

Case Report**Canal of nuck hydrocele mimicking a femoral hernia in an adult female: The utility of point-of-care ultrasound**

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Introduction

A groin bulge in an adult is a frequent complaint that general surgeons encounter and is most commonly secondary to inguinal hernias. Although commonly seen in infants, few case reports have described a Canal of Nuck Hydrocele (CNH) in adult females, which may be attributed to clinical misdiagnosis. As such, we describe a case of a woman with a previous clinical diagnosis of femoral hernia, which was later recognized as a CNH.

Case report

A healthy 41-year-old presented to clinic with a 2-year history of right groin bulge that caused intermittent bouts of groin pain. Surgical history was significant for a laparoscopic appendectomy for perforated appendicitis eight years prior. Initial physical examination showed a reducible bulge below the inguinal ligament that was diagnosed as a femoral hernia. No imaging modalities were utilized, and the patient intended to undergo elective femoral hernia repair. Due to financial reasons, she postponed surgical intervention at that time. A few weeks later, she presented to the emergency room with worsened right groin pain associated with a non-reducible right groin bulge. On exam, a bulge was evident with significant tenderness (Figure 1). A computed tomography scan of the abdomen/pelvis with contrast showed a right inguinal canal mass (Figure 2) measuring 3.5 cm x 2.6 cm traversing along the inguinal ligament. Bedside ultrasound showed a homogenous anechoic fluid collection without any evidence of vascular flow on Dop-

pler, suggesting a CNH (Figure 3). Given the significant amount of pain, the patient was taken for open exploration. Our intra-operative findings included a weak inguinal floor as well as a CNH protruding through the inguinal canal and superficial inguinal ring. The lesion was dissected completely, excised, and the inguinal floor was reinforced using a polypropylene mesh in a Lichtenstein fashion. The patient did well post-operatively and was discharged on post-operative day 1. There were no signs of recurrence on her 8 month follow up. The pathology demonstrated a benign cystic lesion consistent with CNH.



Figure 1: Right groin bulge.

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Figure 2: CT (Computed Tomography) Scan showing CNH and associated direct hernia; **(a)** Axial view **(b)** Coronal view.

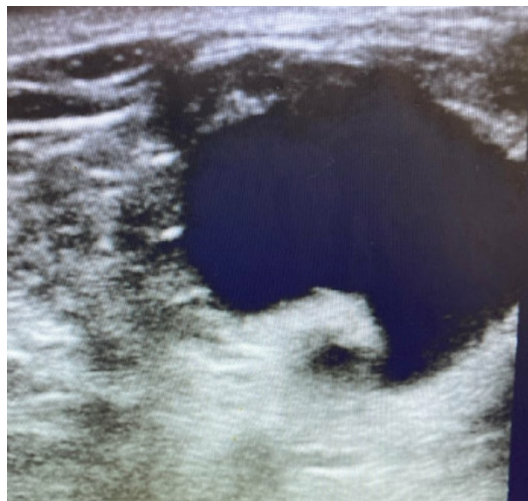


Figure 3: Bedside Ultrasound of right groin bulge demonstrating a homogenous, elongated, well-circumscribed anechoic lesion with connection to the deep ring.

Discussion

Described initially by Nuck in 1691 and later popularized by Coley in 1892, CNH typically presents as a painless non-reducible lump in the groin [1,3]. The prevalence of CNH is reported to be 0.8% to 4.4% in pediatric populations [4]. However, the prevalence in adult females is not well known due to few reported cases. One third of the patients who present with a CNH have a concurrent inguinal hernia and case reports have also described associated femoral hernias and endometriosis within the cyst [3,10,11].

During embryological development, the gubernaculum, a remnant of the mesonephros, becomes the round ligament. Anchoring the uterus in the pelvis, the round ligament begins at the Cornu of the uterus, traverses through the inguinal canal, and ends within the labia majora at mons pubis. When the parietal peritoneum evaginates through the inguinal canal, a CNH is formed, which normally is obliterated by eight months of gestation. Failure in this process leads to a postnatal cyst, which can develop into a hydrocele. In males, a persistent processus-vaginalis secondary to the same mechanism leads to an inguinal hernia or a hydrocele [2].

While the presentation of the cyst in the adult patient can be like groin hernias, various imaging modalities can be helpful for diagnosis. Ultrasound technology is frequently used in pediatric populations to diagnose the cyst and differentiate it from other common pathologies in the groin, including but not limited to lymphadenitis, abscesses, lipoma, leiomyoma, lymphangioma, and rhabdomyosarcoma [2]. Computed tomography is commonly used in adult populations, especially in Emergency Departments (ED), to evaluate groin bulges. An ultrasound and MRI may also be an adjunctive diagnostic modality in ED or inpatient setting in adult patients. In a clinic setting, however, the diagnosis is heavily relied upon physical examination and occasionally ultrasound. A CNH has distinctive features on different modalities. On ultrasound, the cyst appears as a homogenous anechoic structure without vascular flow [7]. On CT scan, the mass appears attenuated, well circumscribed, and at times filled with herniated abdominal or pelvic structures [7]. On an MRI, CNH appears as an elongated cystic structure with possible septation and herniated contents [7]. The sensitivities of different modalities are not well established but there are certain advantages to each. It is known that ultrasound is easily available and cost-effective, however, the reliability of ultrasound also owes itself to the proficiency of the operator. While CT or MRI is expensive and can expose patients to unneeded radiation, the anatomy and concurrent hernias are visualized more accurately [7,8].

There is no standard management of CNH given the lack of data on this rare pathology. Alternative therapies like cyst aspiration have been described in pediatric patients but it is not recommended given the high recurrence rate [6]. While there are no reported cases of non-operative management of CNH, more information is needed to appropriately manage asymptomatic patients with incidental finding of CNH. Multiple case reports have been published regarding surgical management, with repairs primarily based on surgeon preference.

In pediatric patients, CNH is mostly managed via open herniorrhaphy with cyst excision and high ligation of the sac, if a concurrent indirect hernia is encountered [7]. Surgical treatment of CNH in adults also involves excision of the cyst, however, a variety of inguinal hernia repairs techniques have been described including open and minimally invasive approaches [8]. Baig et al describes a patient with a CNH and a femoral canal defect, which was repaired using a modified McVay repair, wherein the Cooper's ligament was fixed to the femoral sheath to repair the femoral canal defect and the internal ring was reapproximated after ligation of round ligament [10]. Qureshi et al repaired the CNH of a 28-year-old female laparoscopically with ligation of the cyst with a preperitoneal mesh repair of the defect [12]. While

we present a patient who underwent excision with Lichtenstein repair, we recognize the various surgical techniques that have appropriately managed this rare pathology.

Conclusion

CNH must be included in the differentials when an adult female patient presents with a groin bulge. Given the nebulous nature of common symptoms, it is prudent to augment the effectiveness of physical examination with clinical history and setting appropriate imaging modality. We further suggest that point-of-care ultrasound accentuates the index of suspicion and should be used when able; however, more investigation is warranted. Established standard of care diagnostic tools and surgical repairs may reduce patient suffering and improve outcomes.

References

1. Coley WM. B. Hydrocele In The Female. *Annals of Surgery*. 1892; 16: 42-59.
2. Holley A. Pathologies of the Canal of Nuck. *Sonography*. 2018; 29-35.
3. Fahmy MAB. Scrotum. *Rare Congenital Genitourinary Anomalies*. Springer, Berlin, Heidelberg. 2015.
4. Kapur P, Caty MG, Glick PL. Pediatric hernias and hydroceles. *Pediatr Clin North Am*. 1998; 45: 773-789.
5. Nasser H, King M, Rosenberg HK, Rosen A, Wilck E, et al. Anatomy and Pathology of the Canal of Nuck. *Clinical imaging*. 2018: 83-92.
6. Ikeda H, Tahara K. Hydrocele, Nuck Hydrocele: Standard Procedure. In: Taguchi T., Iwanaka T., Okamatsu T. (eds) *Operative General Surgery in Neonates and Infants*. Springer. Tokyo. 2016.
7. Rees MA, Squires JE, Tadros S, Squires JH. Canal of Nuck Hernia: a Multimodality Imaging Review. *Pediatric radiology*. 2017: 893-898.
8. Fikatas P, Megas IF, Mantouvalou K, Alkatout I, Chopra SS, et al. Hydroceles of the Canal of Nuck in Adults-Diagnostic, Treatment and Results of a Rare Condition in Females. *J Clin Med*. 2020: 4026.
9. Lee SR. Laparoscopic Hydrocelectomy of Encysted Hydrocele of the Canal of Nuck with High Ligation in Children or Iliopubic Tract Repair in Adults. *J Laparoendosc Adv Surg Tech A*. 2022; 32: 684-689.
10. Baig Z, Hunka N, Gaboury J. Surgical treatment of a canal of Nuck cyst presenting as a femoral hernia: An unusual case report. *Int J Surg Case Rep*. 2021: 106435.
11. Hwang B, Bultitude J, Diab J, Bean A. Cyst and endometriosis of the canal of Nuck: rare differentials for a female groin mass. *J Surg Case Rep*. 2022.
12. Qureshi NJ, Lakshman K. Laparoscopic excision of cyst of canal of Nuck. *J Minim Access Surg*. 2014; 10: 87-89.