



A RARE CASE STUDY OF HYDROCELE OF CANAL OF NUCK

General Surgery

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ABSTRACT

This case study involves a 45 years old female patient who presented to a tertiary care center with inguinal swelling which was initially diagnosed as inguinal hernia, and intraoperatively found to be Hydrocele of the canal of Nuck, which was excised and inguinal defect was repaired under spinal anesthesia. Patient was followed up after 2 weeks and 3 months. Patient had no signs of complications and no signs of recurrence. Hydrocele of the canal of Nuck is a rare surgical condition. This condition is mostly seen in young girls, the incidence is very less in adults. The pathology occurs due to failure of obliteration of processus vaginalis, it can also involve herniation of abdominal contents like uterus, fallopian tubes, ovary, etc. Considering its rarity, it is often misdiagnosed as common groin masses like inguinal hernia. This case study focuses on one such rare incidence and other aspects of this condition.

KEYWORDS

Hydrocele, Canal of Nuck, Inguinal hernia, Processus vaginalis.

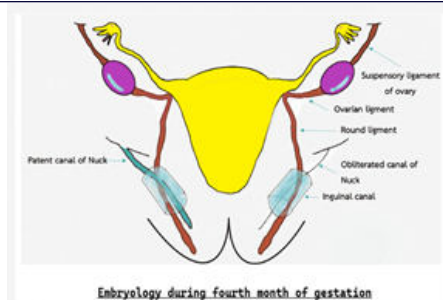
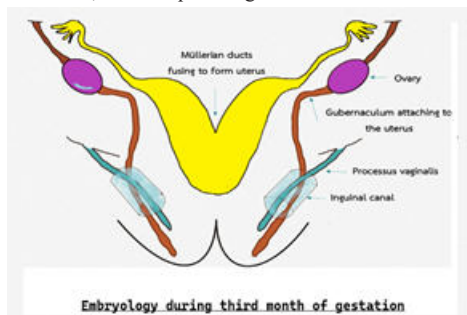
INTRODUCTION

In 1691, Anton Nuck was the first to describe the canal of Nuck ^[1]. Typically, the processus vaginalis obliterates within the first year of life. When this closure fails, it can lead to various pathologies that present as lumps in the groin. These clinical manifestations must be differentiated from other groin masses. A clear understanding of the embryology and pathophysiology of these conditions aids in making a differential diagnosis. Awareness of this anomaly is essential to ensure accurate imaging-based diagnoses and to avoid unnecessary biopsies or surgeries. This review summarizes the pathogenesis of the congenital abnormality, diagnostic approaches, and treatment options.

Embryology

The gubernaculum and the processus vaginalis play essential roles in the development of the inguinal canal. The gubernaculum, a fibromuscular structure, forms between the eighth and twelfth weeks of fetal development ^[2]. It connects to the lower end of the growing gonad and extends toward the groin. In males, the distal portion of the gubernaculum continues to develop, facilitating the descent of the testes into the scrotum. In females, however, due to the absence of androgen influence, the gubernaculum halts growth, allowing the gonads to remain in the pelvic region. This structure attaches to the uterine cornua, where it becomes the ovarian suspensory ligament, while its distal segment forms the round ligament that extends into the inguinal canal and terminates in the labia majora.

Typically, from the eighth month of gestation until the first year of life, the canal of Nuck in humans gradually closes from top to bottom. If this closure fails, it can result in various pathologies. Complete failure to close leaves the canal of Nuck open, leading to potential issues such as a communicating hydrocele or hernia. When the gubernaculum fails to attach to the uterine cornua, the ovary may descend through the inguinal canal ^[5]. In rare cases, uterine herniation along with the ovary has been observed ^[6-8], often involving a fallopian tube or ovarian hernia ^[9]. Ovarian herniation may lead to incarceration, strangulation, or ovarian torsion, which requires urgent medical intervention.



Pathogenesis

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History

A 45 years old female patient came with chief complaint of swelling in right inguinal region since 6 months. Swelling was small in size initially which gradually increased in size, arising from the groin region extending towards the labia. Swelling decreases in size after lying down.

Examination Findings

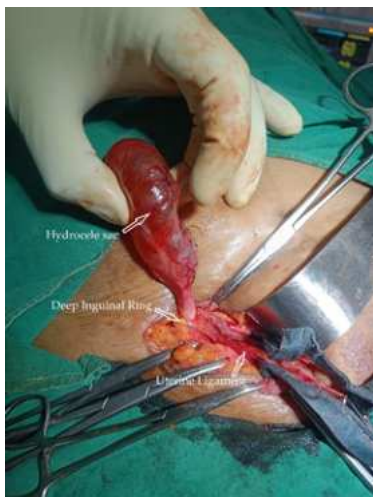
Swelling of size 4cm x 4cm, present in Right Inguinal region which was non tender, soft in consistency and reducible. Cough impulse test – positive.

Imaging

Ultrasound: A defect of size 2 cm in right inguinal region on anterior abdominal wall suggestive of Right inguinal hernia.

Preoperative Diagnosis: Right Inguinal Hernia**Intraoperative Findings**

Under spinal anesthesia, exploration of right inguinal region was done, which revealed inguinal defect with partially obliterated processus vaginalis with fluid filled cyst distally, suggestive of encysted Hydrocele of canal of Nuck. Excision of cyst done with closure of the defect.

**DISCUSSION AND SUMMARY**

Hydrocele of canal of Nuck is a rare condition often misdiagnosed as inguinal or femoral hernias. Historically, literature has limited mentions of this condition, focusing primarily on diagnosis rather than treatment, with few case reports, particularly in adult females. Potential diagnoses for groin masses in females include hernias, lymphadenopathy, abscesses, Bartholin's cysts, hematomas, and even endometriosis. Hydrocele of canal of Nuck may be more common than recognized and should be considered in groin pain evaluations. Ultrasound is an accessible initial imaging tool, while MRI is used for complex cases. Sonography typically reveals an anechoic fluid mass. Treatment usually involves hydrocelectomy followed by hernioplasty, with options including transabdominal preperitoneal repair (TAPP) and Lichtenstein hernioplasty. TAPP is associated with less persistent pain than Lichtenstein repair, and the laparoscopic total extraperitoneal repair (TEP) is also viable. Ultrasound-guided cyst aspiration can provide temporary relief for patients unfit for surgery.

CONCLUSIONS:

The hydrocele of the canal of Nuck is seldom explored in detail in surgical and gynecological textbooks, making it an unfamiliar condition for many clinicians. In some cases, it can be mistakenly diagnosed as an inguinal hernia or an abscess. Ultrasound and MRI are effective imaging tools for differentiating Hydrocele of canal of Nuck from other conditions. If a hernia is present, the preferred treatment is hydrocelectomy, followed by hernioplasty, both of which are surgical interventions.

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