

Hydrocele of Canal of Nuck In an Adult Female: A Case Report

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ABSTRACT

Hydrocele of the canal of Nuck is a rare abnormality, developing in the protruded part of the parietal peritoneum within the inguinal canal in a female. It is homologous to the processus vaginalis in males and obliterates from the seventh month of gestation to one year of age. Failure of obliteration, results in Nuck hydrocele or herniation of intra-abdominal contents through the patent Canal of Nuck. These are usually detected and repaired in young girls within the first five years of life. Reports of Canal of Nuck hydrocele in adults are sparse. Most of these patients are misdiagnosed on clinical examination and correctly diagnosed intraoperatively during surgery for suspected 'inguinal hernia'. Here, this case is about a 25-year-old female, who presented with swelling in the right groin for one month. Computed Tomography of the abdomen showed features suggestive of a hydrocele within the Canal of Nuck. She underwent laparoscopic hydrocelectomy and laparoscopic hernia repair via the transabdominal preperitoneal approach. This case report highlights the novel approach of laparoscopic management of this rare case.

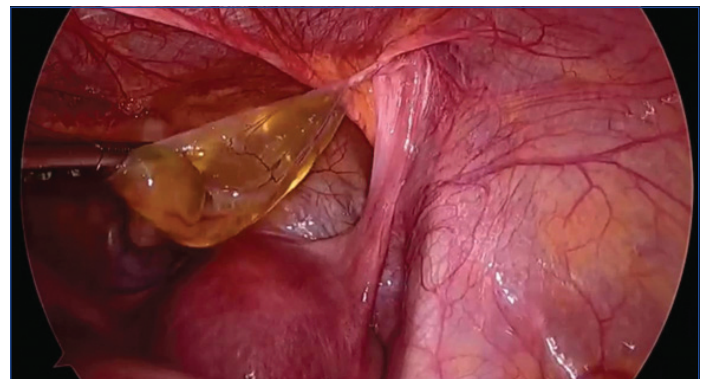
Keywords: Encysted hydrocele, Processus vaginalis, Round ligament

CASE REPORT

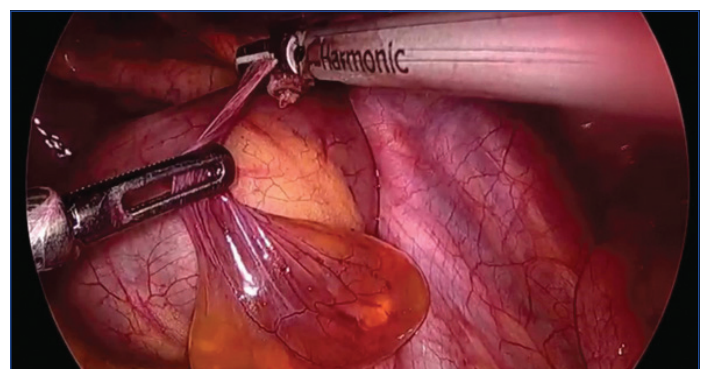
A 25-year-old female presented with the chief complaint of painless swelling in the right inguinal region for one month, which was progressively increasing in size. She noted that the swelling was prominent on coughing and straining. She did not give any complaints of abdominal pain, distension of the abdomen, or vomiting. The patient denied any history of trauma, previous hernias, or lower urinary tract symptoms. Her previous medical and surgical history was unremarkable. Clinical examination revealed a 2x2 cm swelling in the right inguinal region which was prominent on standing with an expansile impulse on straining. The swelling was completely reducible. Her abdomen was soft, non-tender, and non-distended. Her complete blood counts, and renal and liver function tests were within the normal range. Ultrasonography and Computed Tomography of the abdomen was done which revealed a fluid-filled tubular structure, measuring around 30 mm in thickness extending from the right iliac fossa through the inguinal canal into the right labia [Table/Fig-1]. Based on the aforementioned clinical and radiological findings, a preoperative diagnosis of the Hydrocele of Canal of Nuck was made. The patient was planned for laparoscopic management. Diagnostic laparoscopy revealed a 2x3 cm thin walled saccular peritoneal collection, with straw-colored fluid over the hernial defect [Table/Fig-2]. The left deep ring was normal. The peritoneal flaps were raised and the preperitoneal space was created identifying Cooper's ligament medially. The round ligament was identified as content, following which it was skeletonized and divided. The Hydrocele of Canal of Nuck was noted and reduced along with flap and excised [Table/Fig-3]. A 15x12 cm polypropylene mesh was placed covering the myopectineal orifice of Fruchaud and tacked, following which the peritoneal flap was reapproximated and tacked [Table/Fig-4]. The postoperative period was uneventful. The patient recovered satisfactorily and was discharged on the second postoperative day. Pathological evaluation of the sac revealed benign low cuboidal to flat epithelium confirming the preoperative diagnosis of hydrocele [Table/Fig-5]. The patient's complaints were resolved in their entirety and she has remained asymptomatic over a follow-up period of one year.



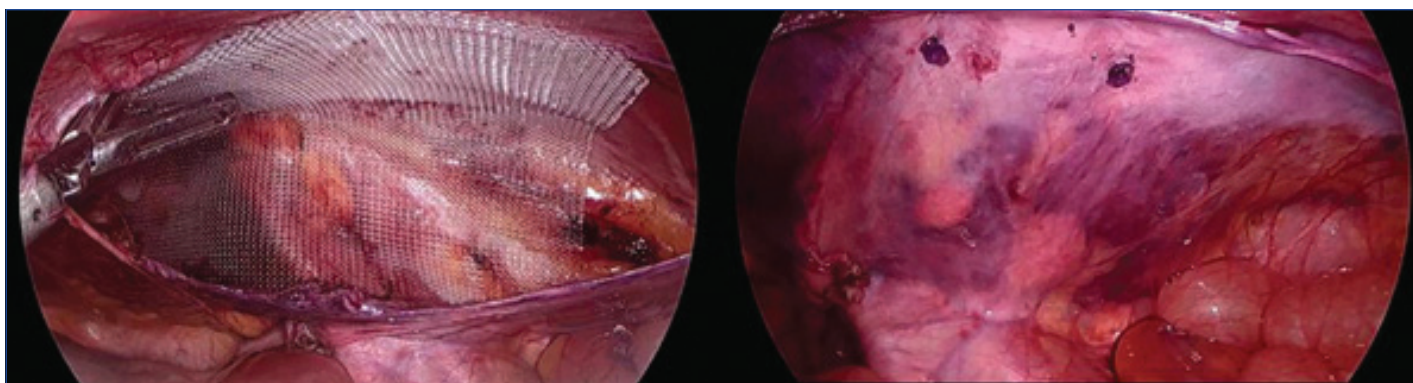
[Table/Fig-1]: Fluid-filled tubular structure extending from the right iliac fossa through the inguinal canal into the right labia.



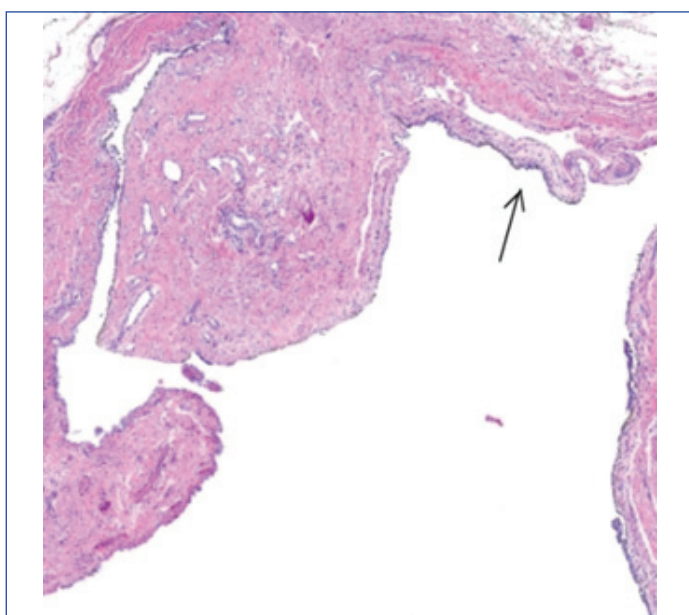
[Table/Fig-2]: A 2x3 cm thin walled saccular peritoneal collection.



[Table/Fig-3]: Reduction and excision of flap.



[Table/Fig-4]: 15x12 cm polypropylene mesh placed.



[Table/Fig-5]: Histopathology of the sac showing cyst lined with benign low cuboidal to flat epithelium.

DISCUSSION

The Canal of Nuck cyst or a 'female hydrocele' as it is more often called, is an extremely rare condition, as a result of the persistence of processus vaginalis in females. During the embryological development of a female, the ovaries move caudally and laterally along with the female gubernaculum. The female gubernaculum is an embryonic structure with an angular bend cephalic to which the round ligament of the ovary develops and caudal to it the round ligament of the uterus develops. In the embryological development of a male, the testicle descends along the gubernaculum and is enveloped in a sac-like extension of the peritoneum called the processus vaginalis. Its counterpart within the inguinal canal in females is called the 'canal of Nuck' [1].

The Hydrocele of the canal of Nuck is classified into three types. The type I is the encysted type, where there appears to be no communication of the hydrocele with the peritoneal cavity. This is the most common type. Type II, where there is a persistent communication between the hydrocele and the peritoneal cavity. Type III is the hourglass type, where there is a constriction at the deep ring, such that the proximal part of the sac is retroperitoneal and the distal part of the sac is within the inguinal canal [2]. The present case was categorised into the second type.

Hydrocele of Canal of Nuck is often misdiagnosed with more common clinical entities such as inguinal hernia, femoral hernia, Bartholin's cyst, lipomas, vascular aneurysms, ganglions, due to lack of clinician's knowledge regarding this entity and due to the scarcity of relevant literature [3,4]. Parikh AK et al, reported the case of a 20-year-old female with a Hydrocele of the canal of Nuck who was managed by surgical excision of the cyst with ligation of the neck

of processus vaginalis [5]. Agrawal S et al, reported a case of a 46-year-old female who presented with swelling in the inguinal region associated with pain. She underwent inguinal exploration, cyst excision, and ligation of the deep inguinal ring [6]. Conventionally, the management of Hydrocele of the canal of Nuck is surgical excision by an anterior inguinal approach. However, establishing a definitive diagnosis by clinical examination and imaging is challenging at times. In such dilemmas, the laparoscopic approach plays a decisive role in diagnosis and treatment. Laparoscopic Transabdominal Preperitoneal (TAPP) and Totally Extra Peritoneal (TEP) methods are becoming popular. These offer the opportunity to accurately diagnose a Hydrocele of the canal of Nuck masquerading as an inguinal hernia and enable the diagnosis of other intra-abdominal pathologies and additional hernias. Fikatas P et al., conducted a study on a series of cases of Hydrocele of the canal of Nuck, where it was postulated that Type I is to be managed by a conventional approach, Type II by laparoscopy, and the management of type III is to be individualized, due to its challenging nature [7].

The choice between TEP and TAPP is determined by the operating surgeon's expertise. In the present case, we proceeded with the TAPP approach. Bunting D et al., have reported that the laparoscopic approach of the encysted hydrocele using TAPP method has greater diagnostic potential [8]. Malik DS and Dhakad BS reported two cases of hydrocele of Canal of Nuck in adult females which were successfully managed by the TAPP approach [9]. TAPP has the added advantage of ruling out any concurrently existing intra-abdominal pathologies. The transabdominal approach further enables the lesion to be identified before dissection in the preperitoneal plane. This can avoid disruption of the hydrocele capsule. In addition, concurrent hernias on the ipsilateral side may be identified and are said to be detected in 15.4% and 18% of patients with inguinal hernias when assessed by open groin dissection or laparoscopy respectively [10]. Baral S et al reported a rare case of bilateral hydrocele of canal of Nuck in a 25 year of female which was managed by open approach. Laparoscopic approach would have facilitated visualization of both the inguinal rings and the associated defects [11].

CONCLUSION(S)

Hydrocele of the canal of Nuck in the adult population is extremely rare and difficult to diagnose. Laparoscopic management via the TAPP approach is ideal, as it offers the benefits of diagnostic laparoscopy to detect concurrent intra-abdominal pathology, and aids in visualizing and excising the encysted hydrocele.

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PLAGIARISM CHECKING METHODS: [Jan H et al.]

- Plagiarism X-checker: Jul 16, 2022
- Manual Googling: Oct 28, 2022
- iThenticate Software: Nov 07, 2022 (20%)

ETYMOLOGY: Author Origin**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Jul 15, 2022**Date of Peer Review: **Aug 28, 2022**Date of Acceptance: **Nov 12, 2022**Date of Publishing: **Mar 01, 2023**