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RESEARCH ARTICLE

DERMOID CYST IN CANAL OF NUCK: A CASE REPORT

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Abstract

Canal of Nuck in females is corresponding to processus vaginalis in males. Defects in canal of Nuck are rare conditions that appears usually early in young females. Failure of complete obliteration of the canal of Nuck results in an indirect inguinal hernia or a hydrocele of the canal. In this study, we present a 28 year old married lady with cystic lesion in the right inguinal canal diagnosed as- cyst of canal of Nuck. Surgical excision was done plus repair of canal defect using proline mesh.

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Introduction:-

Anatomical and Pathological Background

In 1691, Anton Nuck, a Dutch anatomist, was the first to describe the canal of Nuck (1). The canal of Nuck is the female equivalent to the processus vaginalis in males, which usually disappears within the first year of life. It consists of an evagination of peritoneum, which is attached to the uterus by the round ligament, and proceeds through the inguinal ring alongside the round ligament into the labia majora (2,3). Usually, the superior part of this outpouch obturates during or just before birth and disappears within the first year of life. In rare cases, this obturation fails, resulting in a persistence of the canal of Nuck (2,4,1) (Figure 4), which can cause the formation of a female hydrocele, namely the cyst of the canal of Nuck (5,6). This phenomenon in women was first reported by Coley in 1892 (7). Similar to the male hydrocele, a female hydrocele probably arises due to an imbalance of secretion from and absorption of fluid by the secretory membranes of the canal of Nuck (2,8). Although this imbalance is most frequently idiopathic, disturbed lymphatic drainage caused by trauma, infection or inflammation are other possible reasons (3,9).

Case Presentation

A 28-year-old female with no past history of chronic diseases, had history of two vaginal deliveries, presented to emergency department with a pain in the right lower abdomen, suspected for acute appendicitis. Abdominal ultrasound was done that revealed a cystic swelling in the right inguinal canal, for better pelvic MRI evaluation. The patient reported she never suffered from regional pain before, there was no history of local trauma, symptoms of nausea, vomiting or abdominal discomfort. Her body mass index was 28 kg/m². Her medical history was negative for any pathology and surgical procedures. She had two uncomplicated vaginal deliveries. At presentation, physical examination revealed a small palpable mobile lump in the right groin without overlying skin erythema or tenderness. Valsalva maneuver did not make the mass more prominent. There was an absence of incarceration or strangulation. Her abdomen was soft, non-distended and non-tender with no signs of bowel occlusion. Laboratory tests showed measured parameters were within the normal range. Magnetic resonance imaging (MRI) revealed 7.8x3 cm oblong

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cystic swelling occupying the right inguinal canal and protruding to the subcutaneous tissue, there was no evidence of bowel loops, omentum or other solid structures within the mass. The diagnosis of a Nuck cyst was considered, the cyst was not painful, patient was managed conservatively and planned for elective excision of the cyst plus repair of the canal defect.

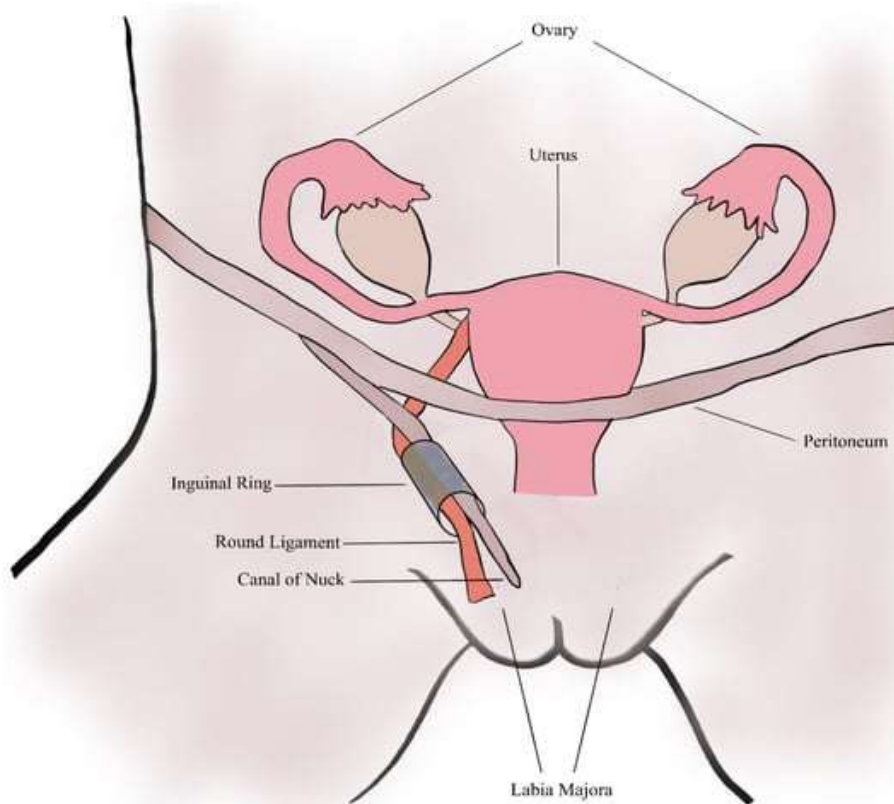
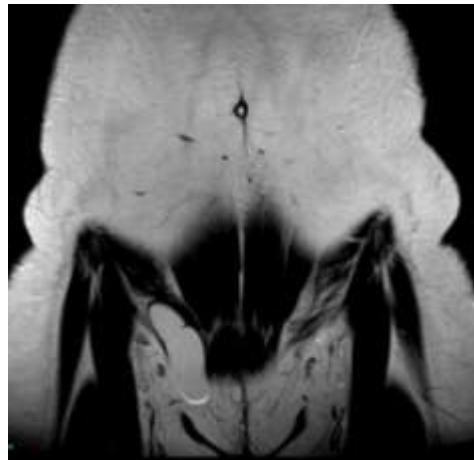
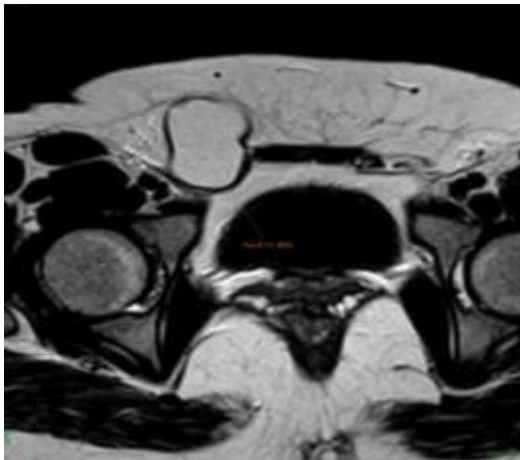


Figure 1:- A schematic of the female anatomy and the patent canal of Nuck.

The cyst was dissected from the round ligament and was completely excised. The defect of the internal inguinal ring was repaired with the use of a mesh. Histology sections revealed- rounded unilocular cavity having a wall lined by keratinized stratified squamous epithelium of variable thickness with prominent granular cell layer resembling skin epidermis with skin appendages including hair follicles, sweat glands, sebaceous glands, the cyst is filled with horny material arranged in laminated layers, the extruded keratin provoked a foreign-body reaction in the adjacent dermis with heavy mixed inflammatory cell infiltrate. Diagnosis is- Dermoid cyst in canal of Nuck.

The patient's postoperative course was uneventful, and she was discharged the next day. Six months postoperatively, the patient remained asymptomatic without any recurrence. Written informed consent was obtained from the patient for publication of this case study and any accompanying images.



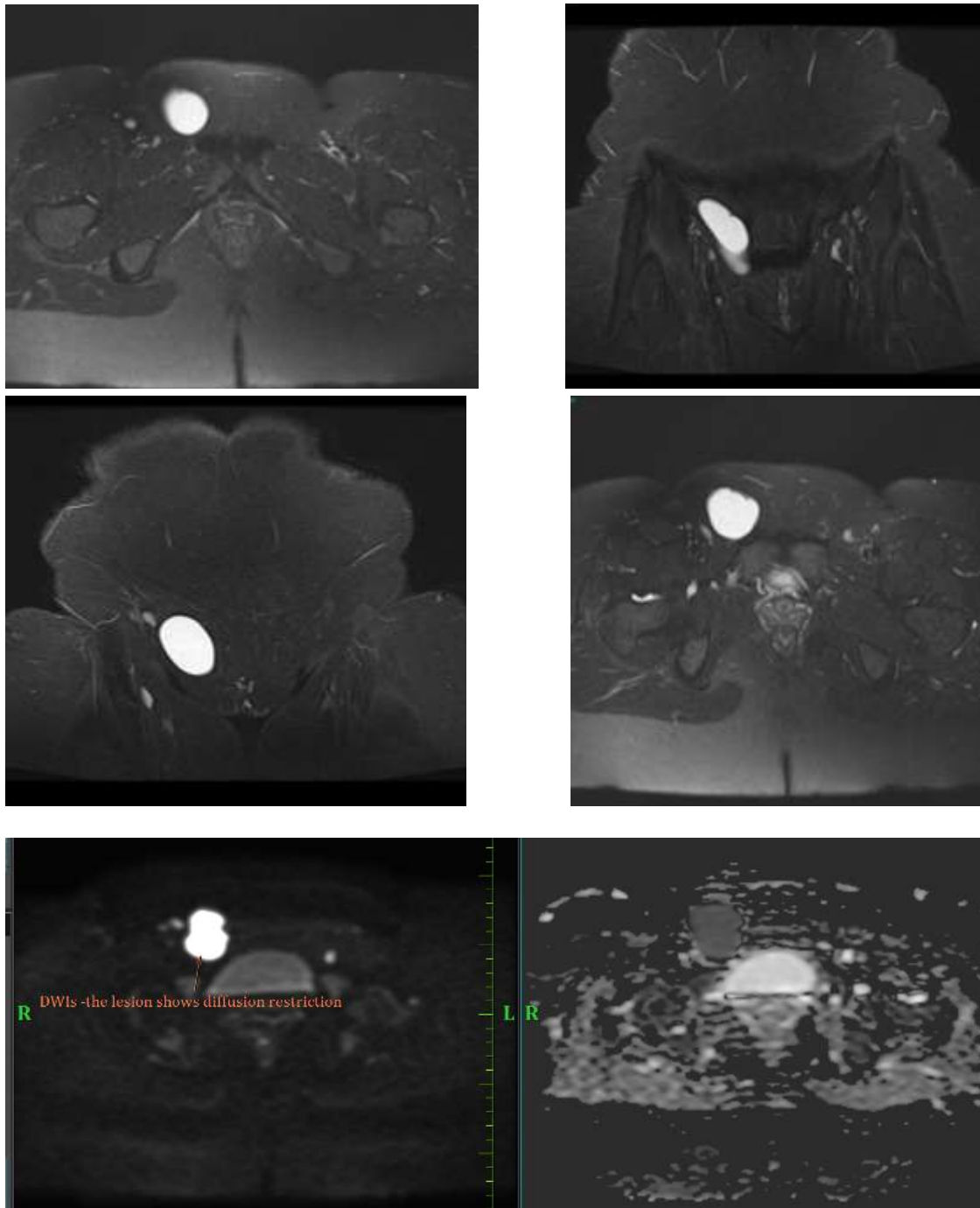


Figure 2:- Pelvis MRI (with and without contrast) showing a thin-walled cystic structure located in the right groin.

Discussion:-

The Canal of Nuck runs through the inguinal canal adjacent to the round ligament and is considered the female analogue of the processus vaginalis in males (16). Normally, the Canal of Nuck is obliterated within the first year of life. Failure of the Canal to close during that period in female infants can result in Nuck hydrocele or herniation of intraabdominal structures through the patent Canal of Nuck (10). Thus, failure of closure is typically detected in childhood. Due to its rarity, accurate information regarding the exact prevalence of hydrocele during childhood is not available. Akkoyun et al (17) reported that only 0.76% of girls <12 years exhibited hydrocele of Nuck among their study population. A comparable prevalence of Nuck hydrocele (0.74%) was also reported by Papparella et al

(18), who reviewed 353 female patients, aged 1-14 years, with inguinal swelling. Literature regarding Nuck hydrocele in adulthood are even more scarce.

At clinical examination, the cyst of the Canal of Nuck is frequently described as a painless or mildly painful reducible or irreducible mass in the inguinal region, which typically extends to the labia majora, and does not expand when performing the Valsalva maneuver (14). Differential diagnosis includes inguinal hernia, enlarged lymph nodes and soft tissue tumours such as lipomas, leiomyomas and endometriosis of the round ligament (19).

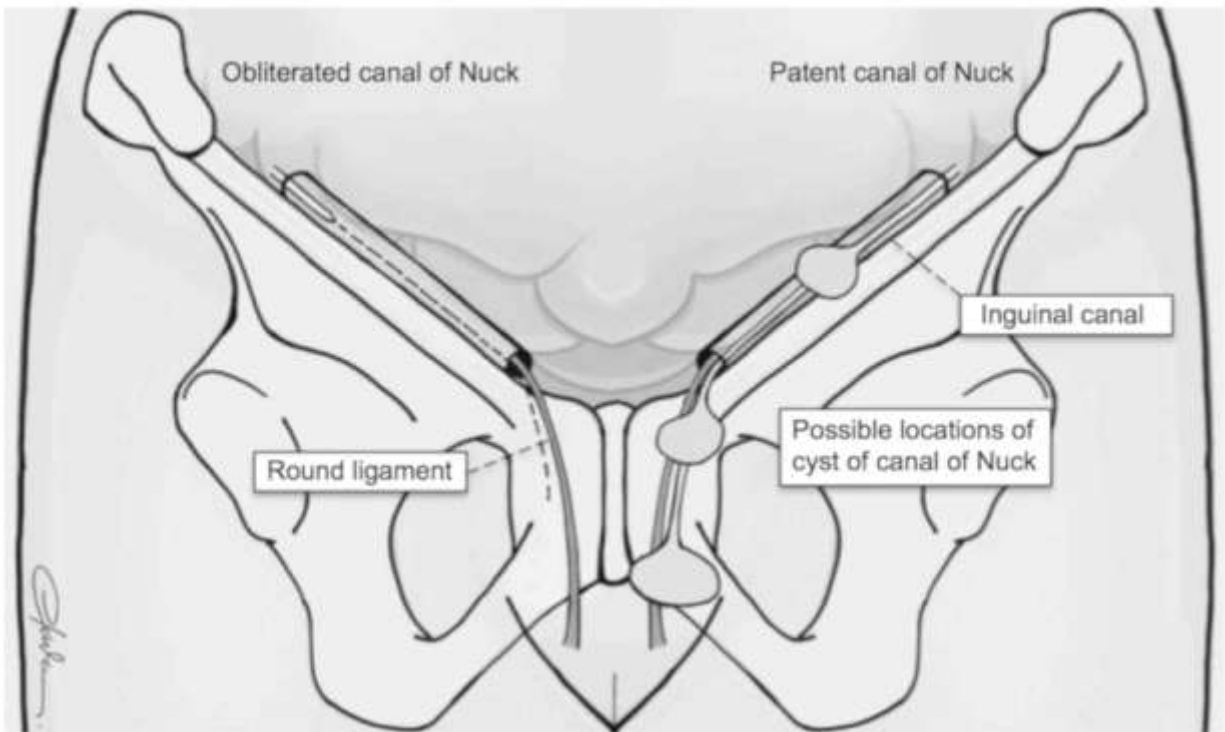


Figure 3:- Anatomy of the inguinal canal with a physiologically obliterated Canal of Nuck and the potential sites of the cyst through the canal when it remains patent.

Anatomy of the inguinal canal with a physiologically obliterated Canal of Nuck and the potential sites of the cyst through the canal when it remains patent.

A cyst of the Canal of Nuck is frequently misdiagnosed as inguinal hernia in females and is only correctly diagnosed intraoperatively. Therefore, preoperative imaging is crucial for diagnosis and further therapeutic options. Imaging with MRI allows a good visualization of the anatomic structures surrounding the cyst, communication between the cyst and the peritoneal cavity and the extension of the cyst of the Canal of Nuck (13). However, despite the utility of imaging in differential diagnosis, surgery along with histological and immunohistological analysis of the excised mass is required for a more conclusive diagnosis of a Nuck cyst.

Another issue that should be addressed is the association of the pathology of the Canal of Nuck with fertility. In the published literature, there was only one association with infertility; a nulliparous woman of reproductive age who underwent simultaneous ovarian cyst excision and repair of patent Canal of Nuck (12). Postoperative courses of all published cases are uneventful. Unfortunately, data concerning postoperative fertility was not available for any of the reported cases but in this case, patient gave her third baby three years after cyst excision- vaginal delivery. Other pathologies of the Canal of Nuck such as ovary herniation or endometriosis of the canal may result in infertility in young females (20).

Surgical management of a cyst of the Canal of Nuck includes open or laparoscopic excision of the cystic structure with concomitant closure of the inguinal internal defect primarily with the use of a mesh (15,21,22). The appropriate

surgical approach is tailored based on the extent of the disease, the accuracy of preoperative diagnosis and the co-existence of an inguinal hernia. In the case of concomitant identification of an inguinal hernia, an additional hernia repair with or without mesh placement can be safely performed. Furthermore, as described by Ferreira et al (11), an additional vulva correction may be indicated in cases of mass extension to the labia majora.

Due to limited data from case reports and small case series, the actual prevalence of Nuck cyst could not be precisely estimated. The significant heterogeneity among the included studies along with the lack of mention of certain parameters by some authors were additional limitations.

Conclusion:-

The cyst of the canal of Nuck is a rare condition, but it should be included in the differential diagnosis list of inguinal tumours in female patients. A focused physical examination followed by high-resolution sonography enables the diagnosis of a cyst of the canal of Nuck. To plan an adequate surgical intervention, cross-sectional imaging, preferably MRI, allowing clarification of the anatomical conditions is of utmost importance. Our review provides insight into the anatomical background, diagnostics, and surgical intervention of a cyst of the canal of Nuck.

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