



CANAL OF NUCK HERNIAS

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ABSTRACT

Canal of Nuck hernia, the female counterpart of male patent processus vaginalis, is a rare entity with only a few reported cases in the literature. This case report includes two cases of the canal of Nuck hernias, reported at Gandhi Medical College and Hamidia Hospital, Bhopal. Both the patients presented with a chief complaint of swelling in the inguino-labial region. Ultrasound examination revealed the swelling to be a hernia sac containing the uterus and both ovaries, confirming the diagnosis of the canal of Nuck hernia. Relevant embryology and the role of imaging in the canal of Nuck hernia are discussed subsequently.

KEYWORDS : Canal of Nuck, Hernia, Hydrocele, Inguino-labial swelling, pediatric

CASE REPORT

CASE 1: An 8-month-old female presented with a congenital swelling in the left inguino-labial region, which increased in size on crying or straining. There was no history of trauma to the inguinal region, vomiting, or abdominal distension.

On examination, a non-tender, reducible, soft swelling was noted over the left labia majora. No redness, temperature change, distended vessels, discharging sinus, or skin discoloration was present. There were no palpable inguinal lymph nodes, and no other swelling was appreciated. The patient's nutritional status was adequate. The abdomen was soft on palpation, and no abdominal distension was noted.

Ultrasound of the swelling was performed, which showed a hernia sac containing the uterus and ovaries (figures 1, 2)

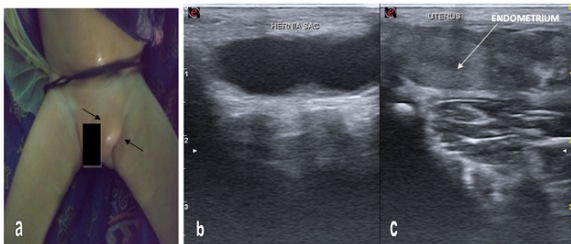


Figure 1(a) Left inguino-labial swelling (black arrows). (b) and (c) Hernia sac in left inguino-labial region containing the uterus

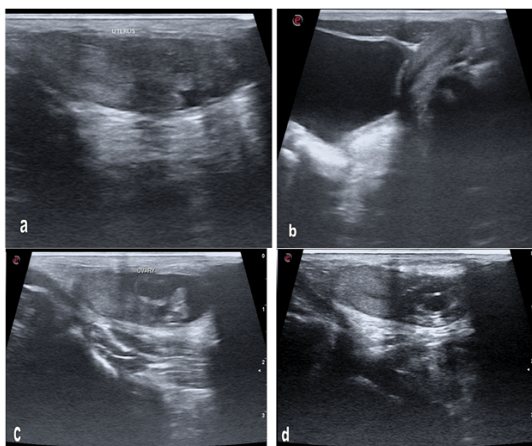


FIGURE 2(a): High frequency ultrasound images of left inguino-labial swelling depicting completely herniated uterus and cervix. Few bowel loops are also seen in hernia sac. Figure 2(b) Ultrasound image showing herniation of the uterus on straining with empty pelvic cavity and uterus lying at the level of deep inguinal ring. Figure 2 (c) and (d)

hernia sac containing uterus and ovaries.

CASE 2: A 2-month-old female presented with a chief complaint of a congenital swelling in the right inguino-labial region, which increased in size on crying or straining. There was no history of trauma to the inguinal region, vomiting, or abdominal distension.

On examination, a non-tender, reducible, soft swelling was noted over the right labia inguino-labial region (Figure 3). No redness, temperature changes, distended vessels, discharging sinus, or skin discoloration was present. There were no palpable inguinal lymph nodes. The patient's nutritional status was adequate. Her abdomen was soft on palpation, and no abdominal distension was noted.

Ultrasound of swelling was performed, which showed a hernia sac containing the uterus, ovaries, and bowel loops in the right inguino-labial region. (figures 4 & 5)

MRI pelvis was also performed, which again showed uterus, bilateral adnexa, and bowel loops in the inguino-labial hernia sac.

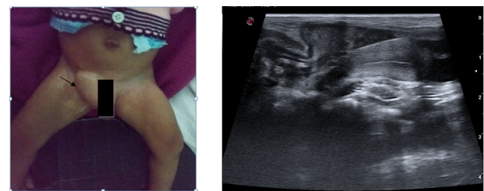


Figure 3: Swelling in the right inguino-labial region. Figure 4: Hernia sac containing the uterus and bowel loops

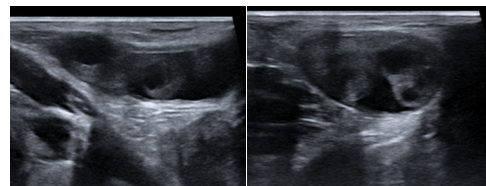


Figure 5 : Ultrasound images showing bilateral ovaries in the hernia sac.

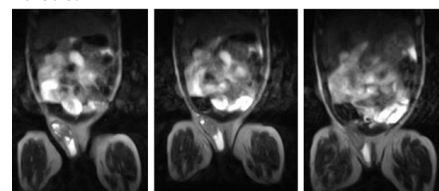


Figure 6: T2 Weighted MR Images in coronal plane showing uterus and ovaries herniating into right inguino-labial region.

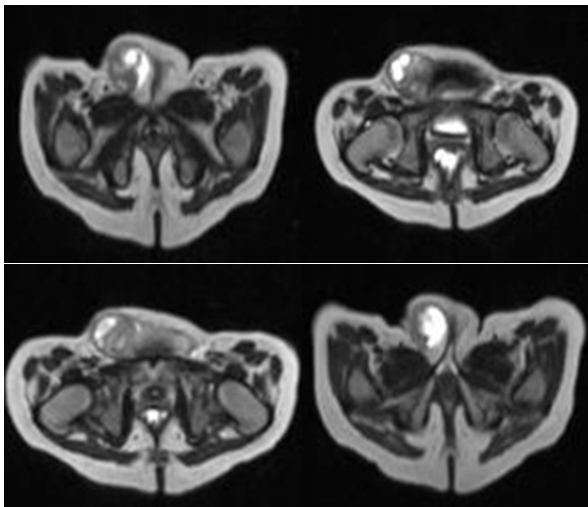


Figure 7: Axial T2 weighted MR images showing uterus and ovaries herniating into the right inguino-labial region.

DISCUSSION

The canal of Nuck is a fold of peritoneum that is analogous to male processus vaginalis. It extends along the round ligament up to the labia majora and usually obliterates around 36 – 40 weeks of gestation. Failure of obliteration can lead to the development of a potential opening in the peritoneum.^[1] Pelvic contents can herniate through this opening into the inguino-labial region, resulting in hernia and hydrocele. Case reports of hernias containing peritoneal fluid, omental fat, ovaries, fallopian tubes, uterus, bowel loops, and even urinary bladder have been described.^[2]

Embryology:

Gonads develop from the gonadal ridge in the dorsal body wall in the retroperitoneal region. A mesenchymal band called 'gubernaculum' attaches the inferior pole of the gonad to the labio-scrotal ridge. The gonads reach up to the deep inguinal ring by contraction of the gubernaculum during the trans-abdominal phase of descent.^[3]

Once at the level of the inguinal ring, an outpouching of the peritoneum called the processus vaginalis develops along the gubernaculum. In males, this processus vaginalis assists the descent of the testis into the scrotum, then regresses, leaving behind a membrane called tunica vaginalis.

In females, the gubernaculum attaches to the body of the uterus. The processus vaginalis regresses and is obliterated by 36- 40 weeks of gestation, preventing the descent of gonads outside the pelvic cavity. Failure of this regression can lead to a defect through which uterus, adnexa, and other pelvic organs can herniate, giving rise to the canal Of Nuck Hernias.^[4]

ROLE OF IMAGING:

In a female child presenting with an inguino-labial swelling, ultrasound is the best initial imaging modality. It is easily available, painless, radiation-free, and can assess herniated contents quite effectively. The hernia sac contents, especially herniated uterus and ovaries, can be accurately identified on ultrasound, and other common differentials like hydrocele, abscess, hematoma, lipoma, lympho-vascular malformation, can be confidently ruled out.^[5]

Doppler ultrasound can help in evaluating the incarceration of herniated contents. Hernias containing ovaries require special consideration as the herniated ovaries are prone to torsion.^[6]

A pre-operative MRI can be done to confirm the diagnosis and further evaluate the pelvis.

Differentials:

Ultrasound of the swelling is the most efficient method to arrive at the diagnosis. Besides canal of Nuck hernia, other swellings which can be encountered in inguino-labial region are tabulated below with their salient clinical and imaging features. [table 1]

Few other rare pathologies that have been reported in the canal of Nuck are endometriosis, meconium hydrocele, and mesothelioma.^[7-9]

Table 1: Differentials of inguino-labial swelling in females in pediatric age group

Differential	Clinical Features	Imaging features on Ultrasound
Abscess/hematoma	<ul style="list-style-type: none"> History of trauma Erythema/discoloration on examination No change in size on crying/ abdominal straining 	<ul style="list-style-type: none"> Hypoechoic collection with mobile internal echoes in subcutaneous plane. No communication with pelvic cavity
Lymph node	<ul style="list-style-type: none"> More in inguinal region than inguino-labial region Usually bilateral discrete swellings No change in size on crying/straining 	<ul style="list-style-type: none"> Rounded / oval hypoechoic node with hilum Necrotic nodes can show mobile internal echoes and loss of fatty hilum
Vascular Malformation	<ul style="list-style-type: none"> Skin discoloration 	<ul style="list-style-type: none"> Dilated vascular channels in subcutaneous plane. No connection to pelvic cavity
Lipoma	<ul style="list-style-type: none"> No change in size on crying/straining 	<ul style="list-style-type: none"> Usually well defined hyperechoic lesion with reticulation, showing no internal vascularity on color Doppler Maybe Hypoechoic or isoechoic
Hydrocele	<ul style="list-style-type: none"> Swelling in inguino-labial region Can change in size on crying/ straining 	<ul style="list-style-type: none"> Anechoic/ hypoechoic collection showing communication to underlying peritoneal cavity

CONCLUSION :

The canal of Nuck hernias, although rare, must be kept in the differentials for inguino-labial swellings in females ,especially in pediatric age group. All inguino-labial swellings in female children should be evaluated by an ultrasound to rule out herniated vital pelvic organs. Hernias containing ovaries require special consideration as the herniated ovaries may undergo torsion.

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