



Clinical Case

Canal of Nuck Hernia Presenting as an Incarceration of Uterus, Ovary, And Fallopian Tube in a Premature Newborn

Hernie du Canal de Nuck Avec Incarcération de 'Utérus, de l'Ovaire et de la Trompe de Fallope chez un Nouveau-né Prématuro

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RÉSUMÉ

The canal of Nuck hernia is a rare congenital entity, that results from the incomplete closure of processus vaginalis in female infants through which pelvic contents herniate into the inguinal canal to the labia majora. The presence of the ovaries and fallopian tubes as the content of the hernia sac is an infrequent finding. We report a case of a hernia of the left canal of Nuck in a 5-week-old premature female patient with left inguinal swelling. The inguinal hernia sac contained the uterus in addition to left ovary and fallopian tube. A reducible umbilical hernia was associated. The surgical repair of both hernias was successfully done in emergency. This report aims to draw the attention of radiologists and surgeons to this rare possibility during management of hernia to avoid the likely damage to herniated structures which can cause life-long consequences.

ABSTRACT

La hernie du canal de Nuck est une entité congénitale rare, résultant de la fermeture incomplète du processus vaginal chez les nourrissons féminins, par laquelle le contenu pelvien fait saillie dans le canal inguinal vers les grandes lèvres. La présence des ovaires et des trompes de Fallope comme contenu du sac herniaire est une découverte peu fréquente. Nous rapportons un cas de hernie du canal de Nuck gauche chez une patiente prématurée de 5 semaines présentant un gonflement inguinal gauche. Le sac herniaire inguinal contenait l'utérus en plus de l'ovaire et de la trompe de Fallope gauches. Une hernie ombilicale réductible était associée. La réparation chirurgicale des deux hernies a été réalisée avec succès en urgence. Ce cas clinique vise à attirer l'attention des radiologues et des chirurgiens sur cette possibilité rare lors de la prise en charge des hernies, afin d'éviter les dommages probables aux structures herniées qui peuvent avoir des conséquences à long terme.

INTRODUCTION

The canal of Nuck hernia is a rare congenital entity, that results from the incomplete closure of processus vaginalis in female infants through which pelvic contents herniate into the inguinal canal to the labia majora [1]. The incidence of canal of Nuck hernias is about 1.9%. It is uncommon as compared to inguinal hernias in males [2]. About 15% - 20% of inguinal hernias in female infants contain the ovary and Fallopian tube; however, the presence of a uterus as a content of the hernia sac side by side with the ovary and fallopian tube is not frequent [3]. We report here a case of a hernia of the left canal of Nuck in a 5-week-old female.

CASE PRESENTATION

A premature female was born at 31 weeks of gestation by vaginal delivery. During her first examination, no inguinal masses were noted and her external genitalia appeared normal. She was seen by the surgical team at the request of the pediatrician at five weeks of age at the Regional Hospital of Buea, Cameroon. The patient presented with irritability, vomiting, and an irreducible mass in the left groin noticed by her pediatrician. approximately 3 hours before assessment by the surgical team.

On physical examination, the general state of the child was satisfactory. The conjunctivae were pink and the sclerae were anicteric. The abdomen was full and there was an

umbilical swelling. This swelling was reducible, non-tender, expansile, and impulsive when the child cried. The abdomen was soft and tympanic. The bowel sounds were present and normoactive. The groin examination revealed a left groin swelling of about 2x3cm, non-reducible, tender, and non-expansile. (Fig 1). An incarcerated inguinal hernia was suspected.



Figure 1: Visible left groin and umbilical swelling

An ultrasound scan was performed with a Sonoscape Ex1 portable machine using a linear transducer of 5-12 Mhz frequency. It visualized in the left groin, an incomplete closure of the processus vaginalis. The left adnexa and uterus were the inguinal hernia sac (Fig.2).

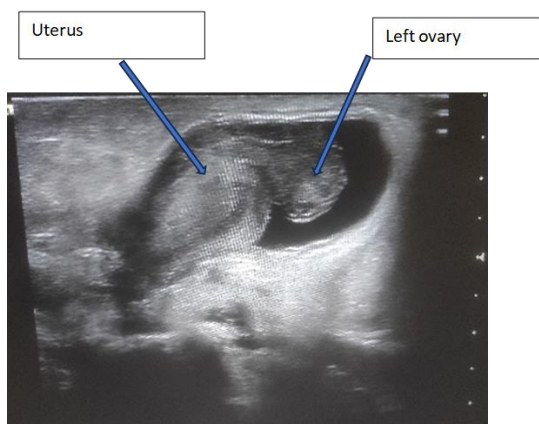


Figure 2: Ultrasound image of the hernia sac containing the uterus and the left adnexa.

The Doppler analysis showed normal vascularization of the contents of the hernia sac. The diagnosis of an incarcerated left inguinal hernia containing the uterus and the left ovary was made. Elsewhere, an umbilical defect was also depicted with herniation of bowels, reducible. A pre-operative assessment of the patient was done by the anesthesiologist team. The patient was classified ASA 1 and Altermeier 1. It was placed in a dorsal decubitus position under general anesthesia. The extremities were wrapped in a soft cotton band to keep the patient warm. A transverse incision of about 4cm was placed above and lateral to the pubic tubercle in the left groin. The subcutaneous fat and the fascia of Scarpa were opened, grasping them with small-toothed Adson forceps. Using blunt dissection and cautery the external oblique aponeurosis and external ring were exposed. The hernia sac was seen and gently separated from the round ligament of the uterus. The hernia sac was opened revealing the

uterus and the left fallopian tube which were both viable with no signs of ischemia. The contents of the sac were gently reduced into the abdominal cavity (Fig 3).

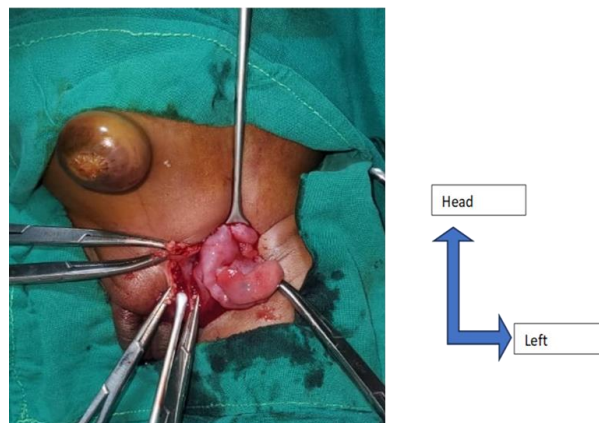


Figure 3: Intraoperative image of the contents of the hernia; the uterus and the left adnexa

The sac was twisted and a high ligation was performed. An additional suture closure of the internal ring was done. Subcutaneous tissues were approximated using three 3/0 absorbable interrupted stitches and the skin was closed with a 3/0 absorbable continuous subcuticular suture. A dry sterile dressing was done.

The patient had an uneventful postoperative course with adequate pain control, and tolerance of oral feeds, and was discharged home on the 5th day after the surgery. The patient had no complications present at the three-week follow-up visit.

DISCUSSION

The prenatal development of the inguinal canal is due to the contribution of 2 main foetal anatomic structures, the processus vaginalis and the gubernaculum testis [4].

The gubernaculum testis attaches to the lower pole of the fetal gonad along its superior aspect and attaches to the skin of the fetal groin along its inferior aspect. In male infants, the gubernaculum testis assists in the descent of the testis from the abdomen through the inguinal canal into the scrotum. In female infants, the midpoint of the gubernaculum testis attaches to the uterus and prevents ovarian descent into the inguinal canal [5]. The ovarian ligament, which extends medially from the ovary to the uterus, and the round ligament, which extends into the inguinal canal, are postnatal homologues of the foetal gubernaculum testis in female infants [5].

The processus vaginalis is a tubular fold of the peritoneum that invaginates into the inguinal canal. The processus vaginalis develops around the sixth month of gestation as an evagination of the parietal peritoneum. Depending on the gender, it is accompanied by the testis or round ligament of the uterus and passes through the inguinal canal up to the scrotum or the labia major. The processus vaginalis is smaller, in female infants and obliterates around the eighth month of gestation. The obliteration of the processus vaginalis proceeds gradually in a superior-to-inferior direction [4]. If the processus vaginalis remains patent, it is termed the canal of Nuck. The canal of Nuck

allows pelvic contents, such as bowel, omental fat, fluid, ovary, fallopian tube, rarely the uterus, and the urinary bladder, to herniate through the inguinal canal to the labia majora. [4]

Our case is a female baby who was born prematurely at 31 weeks. This corroborates with reported literature which shows that inguinal hernia is high in premature babies which is about 30% and is 6 times higher in boys. Literature also reports that 43% of ovarian hernias are strangulated [6]; this was not the case for our patient. The ultrasound showed that the contents were the uterus and the left adnexa. The doppler mode revealed that the blood flow was normal with no signs of ischemia. This is consistent with published literature which recommends ultrasound as the imaging modality of choice, for initial evaluation and to exclude incarceration and strangulation using the Doppler mode [5,7].

The diagnosis of a strangulated or incarcerated groin hernia in females warrants urgent surgical treatment to avoid the torsion and necrosis of the ovaries [4]. Our patient was operated on as an emergency on the same day of diagnosis.

A repair of the canal of the Nuck hernia is recommended and done via either laparoscopic or open technique [8]. Some surgeons advocate for contralateral inguinal canal exploration [8]. In our case, successful open repair was performed.

It should be noted, that the surgical repair of this hernia is usually a more complex and challenging procedure than a common inguinal hernia repair. This difficulty is due to the adhesions between the contents and the wall of the hernia sac thus increasing the risk of damage during their isolation [8]. Ultrasonographic and gynecologic follow-up until reproductive age is recommended, owing to the uncertain relationship between this disorder and other genital tract anomalies [8].

CONCLUSION

Irreducible and incarcerated canal of Nuck hernias in infants may contain the uterus and adnexa. Urgent surgical management is the standard to prevent irreversible injuries to the hernia contents. Careful preoperative diagnosis is paramount and ultrasonography is a useful aid in making

an accurate diagnosis and evaluation of the content of the hernia sac, hence should be routinely obtained in all female infants with inguinal swelling.

Conflicts of Interest

The authors declare no competing financial or personal interests.

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Authors' Contribution

All the authors contributed to the manuscript drafting and correction research. They read and agreed to the final version of the manuscript.

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