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Femoral hernia repair in children: A Case Report

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Abstract

Femoral hernia (FH) is a rare condition in children, characterized by the protrusion of abdominal organs through the femoral canal. The localization of FHs is classified into typical and atypical variants. This report presents two clinical cases of FH treatment in children. In the first case, following an examination and identification of a typical FH in an 8-year-old boy, open FH repair using Lockwood's technique was performed. In the second case, an atypical FH (Laugier's hernia) was diagnosed in a 7-year-old girl during diagnostic laparoscopy. The child underwent video-assisted percutaneous extraperitoneal FH repair. The article discusses the challenges of the differential diagnosis of FHs and the methods of their treatment.

Keywords:

Child, femoral hernia, laparoscopic-assisted surgery, laparoscopy

Introduction

Femoral hernia (FH) is a rare condition in children, characterized by the protrusion of intraperitoneal organs, covered by the peritoneum, beyond the anterior abdominal wall through the femoral canal. In addition to the typical FH, the literature describes rare localizations occurring in various atypical sites: in the lacunar ligament (Laugier's hernia); in the transverse fascia (Cloquet's hernia); and in the region of the femoral vessels, including lateral (Hesselbach's hernia), prevascular (Velpeau's hernia or Teale's hernia), and retrovascular (Serafini's hernia) hernias.

We present two clinical cases of FH treatment in children, utilizing both video-assisted and open surgical techniques.

Case Presentation №1

Patient M., an 8-year-old boy, was admitted electively to the pediatric surgery department with the diagnosis of right

FH and left inguinal hernia. The diagnosis was confirmed by ultrasonography (US): a hernial protrusion was visualized on the right below the inguinal ligament during straining. The internal inguinal ring on the left was widened to 3.5 mm.

Local status: External genitalia are developed according to the male type; the testes are in the scrotum. In the projection of the left external inguinal ring, a hernial protrusion is observed during coughing, which is easily reducible into the abdominal cavity. In the projection of the middle third of the inguinal canal on the right, below the inguinal ligament, a hernial protrusion is detected during coughing, also freely reducible into the abdominal cavity [Figure 1].

The child underwent surgical treatment: through an oblique skin incision parallel to and below the right inguinal ligament, the FH sac was mobilized layer by layer up to the internal femoral ring [Figure 2A]. The hernia sac was opened (its contents consisted of fatty tissue), sutured, ligated, and excised at the base. The defect was repaired using

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Lockwood's technique (suturing the inguinal ligament to the pectineal ligament with interrupted Polyester 2/0 sutures) [Figure 2B]. Additionally, hernioplasty of the left inguinal canal was performed using Martynov's method.

The postoperative period was uneventful. The child was discharged on the third postoperative day.

Case Presentation №2

Patient M., a 7-year-old girl, was admitted electively to the pediatric surgery department with a diagnosis of left-sided inguinal hernia, identified during a routine examination.

Local status: The external genitalia are developed according to the female type. In the left femoral region, below the inguinal ligament, a hernial protrusion is observed during coughing, which is easily reducible into the abdominal cavity.

The child underwent laparoscopy, which revealed obliterated internal inguinal rings. On the left side, a funnel-shaped retraction was identified below the inguinal ligament and medial to the inferior epigastric vessels, in the projection of the lacunar ligament, confirming the diagnosis of Laugier's hernia [Figure 3A].

In the defect projection, a Tuohy needle with a double polypropylene 3/0 suture was inserted through the skin. The needle with the sutures was guided subperitoneally around the lateral semicircumference of the hernia sac neck, with the suture ends brought into the abdominal cavity. Similarly, the needle was guided subperitoneally along the medial semicircumference of the hernia sac, and a loop was introduced into the abdominal cavity. The suture ends were inserted into the loop and extracted externally [Figure 3B].

The ligatures were tied, and the knots were buried beneath the aponeurosis, closing the femoral defect.

The postoperative period was uneventful, and the child was discharged on the second postoperative day.

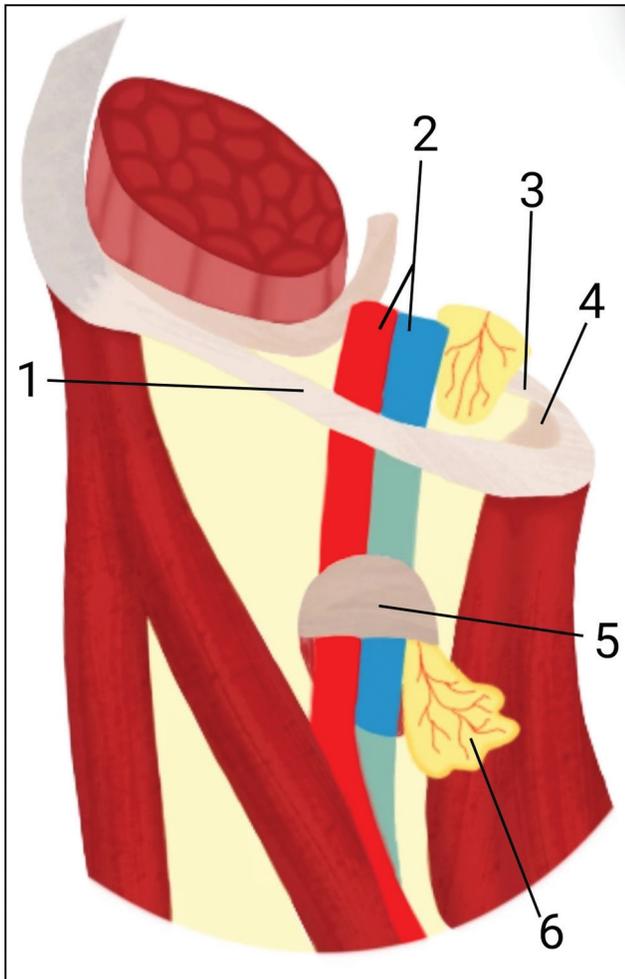


Figure 1: Schematic representation of a femoral hernia (FH): 1 – inguinal ligament; 2 – artery femoral and vein femoral; 3 – arcus ileopectineus; 4 – lacunar ligament; 5 – hiatus femoral; 6 – FH

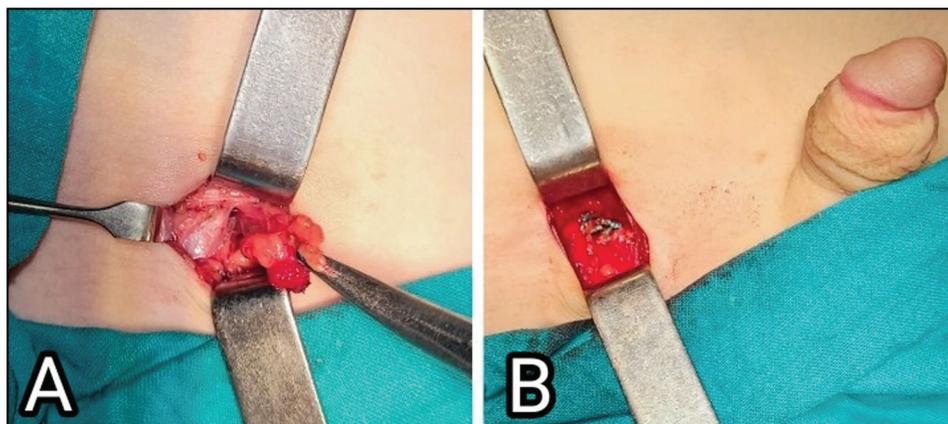


Figure 2: Intraoperative images. Closure of the femoral ring with the Lockwood procedure: (A) before surgery; (B) after surgery

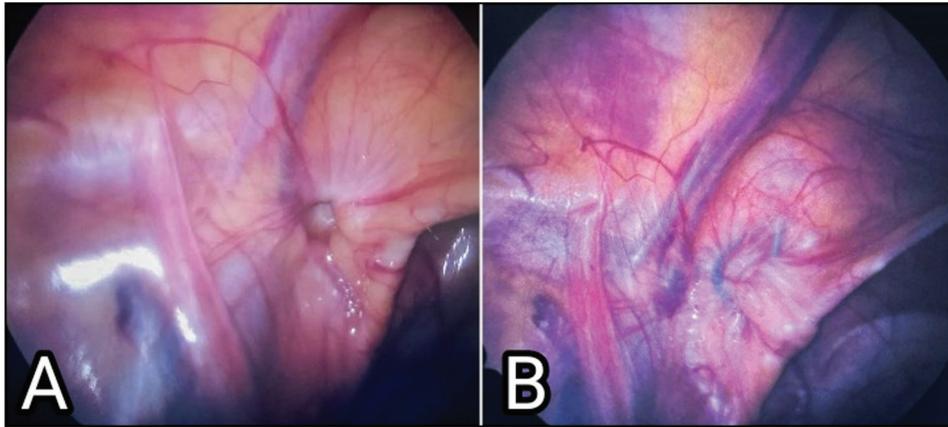


Figure 3: Intraoperative images. Laugier's hernia: (A) before surgery; (B) after surgery

Discussion

Before the development of the laparoscopic approach to hernia treatment, the incidence of FHs was less than 1% of all inguinal hernias. Studies utilizing laparoscopic methods have reported a higher incidence of FH, reaching up to 2.6%. There are instances where pediatric surgeons, despite frequently performing surgeries for inguinal hernias, have never encountered FH during their clinical practice.^[1] Currently, there is no consensus regarding gender predominance among children with FH. The mechanism of FH formation is not yet fully understood. It is hypothesized that FH may result from abnormal development of the femoral canal and peritoneum during embryogenesis or an acquired weakness of the lacunar ligament.

Given the rarity of this condition, diagnostic errors are reported in 35%–75% of cases.^[2-4] Examination by an experienced clinician identifying a tumor-like mass below the projection of the inguinal ligament, combined with US, is crucial for diagnosing FH in children. Cases of strangulated FH have been reported, with omental strangulation being the most common.^[3,5] In our observations, no cases of strangulation were noted. FH can also follow atypical pathways through the femoral ring. When FH protrudes through an opening in the lacunar ligament, it is classified as Laugier's hernia.

Diagnosing Laugier's hernia is challenging due to its similarity to typical inguinal hernias, and the diagnosis is often made during diagnostic laparoscopy. This is because open surgeries, due to the small size of the structures and limited access, make differential diagnosis more difficult.

Currently, there is no consensus on the surgical method for treating FH. According to the literature, most cases favor open surgery using Lockwood's method. However, laparoscopic hernioplasty and video-assisted

percutaneous internal ring suturing for FH have also been recommended. The laparoscopic approach is effective due to its ability to provide accurate differential diagnosis of FH types and assess the presence of inguinal hernias, allowing their repair during the same procedure.

The follow-up period for our observations was 3 years, with no FH recurrence reported.

Conclusion

Due to the low incidence of FHs and the lack of experience among most pediatric surgeons in managing this condition, the differential diagnosis of inguinal and FHs remains challenging. The use of laparoscopy facilitates the diagnosis of both inguinal and FHs and enables simultaneous correction of defects in cases of bilateral involvement.

Author contributions

All authors have fully met the ICMJE authorship criteria as follows: drafting of the manuscript: LME; critical revision of the manuscript for important intellectual content: LME, DAP, MVP, and MRG. All authors have read and approved the final manuscript. All authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Ethical policy and Institutional Review Board statement

All study procedures were approved by the Biomedical Ethics Board of the Moscow Regional Research and Clinical Institute (protocol no. 19 dated December 5, 2024).

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their

images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed. Written informed consent was obtained from parents of the patients.

Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Not applicable.

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