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A new minimally invasive technique for the repair of femoral hernia in children
About 13 laparoscopic repairs in 10 patients

Lucas E.M. Matthyssens[1], Paul Philippe*

Department of Pediatric Surgery, Clinique Pédiatrique, Centre Hospitalier de Luxembourg, L-1210 Grand-Duchy of Luxembourg, Luxembourg

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Abstract

Background: Femoral hernias in children are rare and often misdiagnosed. The classic treatment is through an open anterior approach. Since the advent of laparoscopic treatment of inguinal hernia in children, laparoscopy has been proposed to offer an accurate diagnosis and treatment, especially in case of recurrent hernia or bilateral disease. This review was undertaken to report our experience with the primary laparoscopic diagnosis and treatment of pediatric femoral hernias and to investigate its safety and feasibility.

Methods: All cases of pediatric femoral hernia in a consecutive series of children treated laparoscopically for groin hernias in a single institution over a 7-year period (2001-2007) were identified and studied for patient characteristics, presentation, pre- and perioperative findings, details of the operative repair, and postoperative outcome.

Results: Out of a prospectively studied series of 462 laparoscopic pediatric inguinal hernia repairs in 389 patients, 13 femoral hernias were treated in 10 patients (6 boys), with a mean age of 71/2 years (range, 1.7-12). The preoperative diagnosis of femoral hernia was accurate in 7 patients. Seven femoral hernias were exclusively right sided; 3 were bilateral. All 13 femoral hernias were successfully treated by a standardized transabdominal laparoscopic approach with the use of three 3.5-mm trocars. All patients were treated in a day care setting. No postoperative complications occurred. No recurrences were seen until the present time, with a mean follow-up of 31/2 years.

Conclusions: Laparoscopy provides a straightforward, accurate diagnosis for the rare and often missed pediatric femoral hernias. The new technique described offers a safe and efficient minimally invasive anatomical repair of the crural orifice in children, even when not suspected preoperatively. The laparoscopic diagnosis of 13 femoral hernias from a cohort of 462 laparoscopic groin hernia repairs (2.8%) may suggest a higher prevalence rate of this unusual type of hernia in children than earlier described in literature.

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* Corresponding author. Department of Pediatric Surgery, Radboud University Nijmegen Medical Center, Nijmegen. Tel.: +352 44116109; fax: +352 441323.
E-mail address: philippe-p.paul@chl.lu (P. Philippe).
[1] Current address: Radboud University Medical Center, Nijmegen, The Netherlands.

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Femoral or crural hernia (Nyhus type IIIc) is rare in adults and even rarer in children. It accounts for 3% to 6% of all abdominal hernias in adults [1-3] and has a reported incidence in children varying between 0.1% and 0.9% of all inguinal hernia repairs [1,3-10].

The clinical diagnosis of pediatric femoral hernia (FH) is notoriously difficult [11], and many surgeons may only see an FH in a child once during their career [3,4,6]. Because of its rarity, misdiagnosis occurs in more than half of the cases [3,12]. Some FHs are diagnosed pre- or perioperatively, but an important number is discovered only at the time of groin hernia "recurrence" [4,9,12].

The standard operative repair of FH is through an open anterior approach, either inguinal ("high") or crural ("low"), and involves the resection of the hernia sac and its accompanying lipoma, closure of the peritoneum, and repair of the femoral defect by suturing either the inguinal ligament [13] or the conjoined tendon and the transversalis fascia [4] to the Cooper ligament [6].

A minimally invasive posterior approach for FH has been reported both in adults and in children [14-16]. Both pre- and transperitoneal endoscopic approaches have been advocated in adults as well as in pediatric patients. The laparoscopic repair of the crural orifice is performed with the use of a prosthetic patch, even in children [14], where it should probably be avoided.

We reviewed our experience with the minimally invasive laparoscopic diagnosis and repair of FH without the use of prosthetic material in a consecutive prospectively studied series of pediatric patients with groin hernias treated in a single institution over a 7-year period.

1. Material and methods

Since the year 2000, all children older than 6 months with a groin hernia were treated at the Children's Clinic of Luxemburg by a minimally invasive standardized transabdominal laparoscopic approach described previously [17]. We reviewed all the pediatric FHs treated between 2001 and 2007 from a prospectively collected database.

Patient files were studied together with the anesthesia and operative reports for detailed informations on patient age at presentation; sex; medical history; the signs, symptoms, and clinical and/or radiological findings at presentation; the surgeon's preoperative findings and diagnosis; the intraoperative findings and treatment; and the postoperative evolution.

All patients were operated on in a day care setting under general anesthesia with endotracheal intubation by a standardized laparoscopic technique. After creating a CO_2 pneumoperitoneum to an intraabdominal pressure of 8 to 10 mm Hg, three 3.5-mm trocars were inserted: one in the umbilicus, for a 3-mm 0° telescope, and one at the lateral border of the rectus abdominis muscle bilaterally, for instrumentation. The diagnosis of FH was confirmed by direct visualization of the femoral orifice, medial to the femoral vein and under the inguinal ligament (Fig. 1), whereas the internal inguinal ring was not patent (Fig. 2). Using monopolar hook dissection, the peritoneum was incised circumferentially around the femoral orifice; and the accompanying lipoma was resected until the medial aspect of the femoral vein, the Cooper ligament, and the inguinal ligament of Poupart, together with the conjoined tendon, were clearly identified (Fig. 3). The latter, with the transversalis fascia, was then sutured to the Cooper ligament using 1 or 2 nonabsorbable braided polyester 2-0 sutures, intracorporeally knotted (Fig. 4). The peritoneum was then closed, with an added plication of the ipsilateral umbilical ligament as an extra reinforcing patch [18] in the last 4 patients (Fig. 5).

An outpatient clinical control visit was performed 4 weeks postoperatively. To study and confirm the late follow-up results, all patients and their parents were contacted by telephone for an interview and a follow-up questionnaire about postoperative pain, recurrence, physical activity, and cosmetic satisfaction at a mean of 40.8 months after the operation. If necessary, the patients were invited to our clinic for clinical reevaluation (1 case).

2. Results

Out of 389 patients (462 hernias) laparoscopically treated for groin hernias between 2001 and 2007, 10 patients with 13 FHs were identified. All patients and their parents were available for follow-up.

The mean age of these 6 boys and 4 girls was 71/2 years, ranging between 11/2 and 12 (Table 1).

In 7 of the 10 patients and 9 of the 13 hernias (70%), a preoperative clinical diagnosis/suspicion of FH was noted in

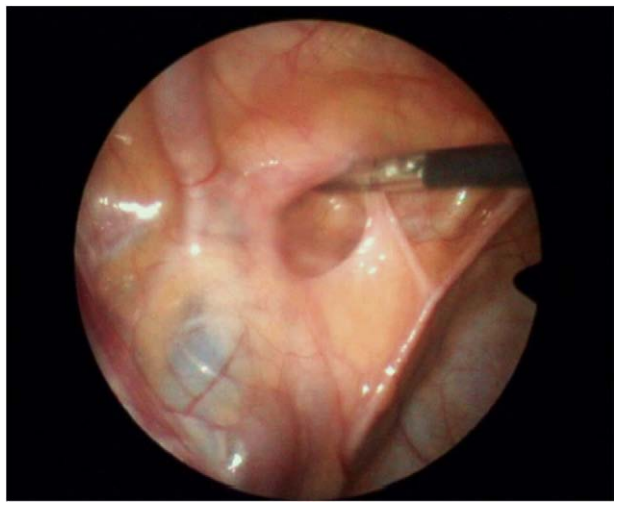

Fig. 1 Left FH.