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Chapter

Laparoscopic Findings of Rare Pediatric Inguinal Hernias

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Toshihiko Watanabe and Yutaka Kanamori*

Abstract

Pediatric inguinal hernias are caused to the patency of the processus vaginalis (PPV). The principle for the repair of indirect inguinal hernias in children consists of complete ligation of the PPV. Laparoscopic percutaneous extraperitoneal closure (LPEC) has spread rapidly since it was reported by some groups from around 1998, and the number of institutions adopting this method as a standard procedure for pediatric inguinal hernia is increasing in Japan. Since the closure of PPV by laparoscopic surgery is popular, rare hernias in children can be observed from the abdominal cavity. We present the laparoscopic findings of rare pediatric inguinal hernias and report their experience.

Keywords: indirect inguinal hernia, direct hernia, femoral hernia, child, adult

1. Introduction

Most inguinal hernias in children are classified as indirect inguinal hernias. Laparoscopic percutaneous extraperitoneal closure (LPEC) repair for pediatric indirect inguinal hernia is a standard technique in our facilities [1, 2]. We experienced two rare cases of pediatric inguinal hernias and reported their laparoscopic findings.

2. Case reports

2.1 Case 1

A one-year-old boy was admitted to our hospital for the incarceration of right inguinal hernia several times. He underwent LPEC procedure as a right indirect inguinal hernia. Laparoscopic findings demonstrated that the hernia orifice was present in the medial inguinal fossa (**Figure 1**). We converted the open approach and performed to reinforce the posterior wall of the inguinal canal. After the hernia sac was opened and excised, the transversalis fascia and Cooper's ligament were closed (McVay repair).

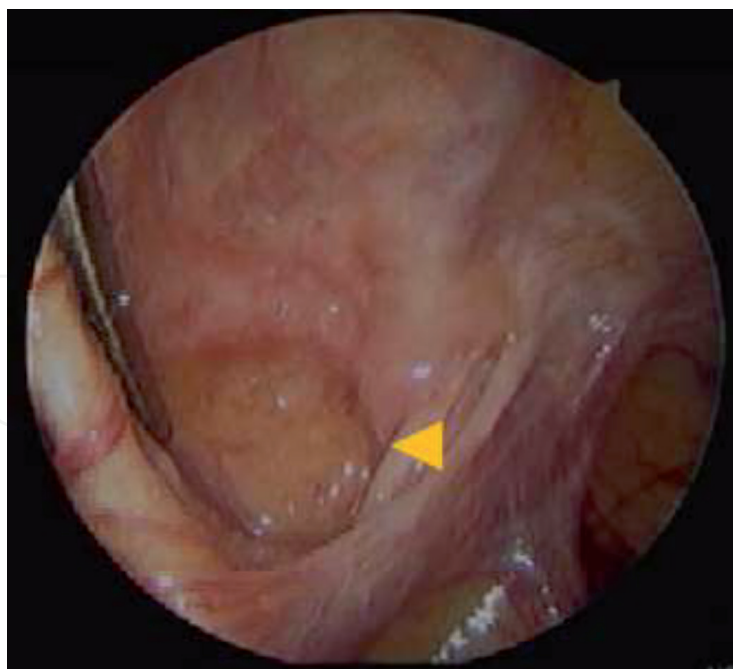


Figure 1.
Laparoscopic finding of right direct inguinal hernia. Hernia orifice presented medially to the external iliac vessels (arrowhead).

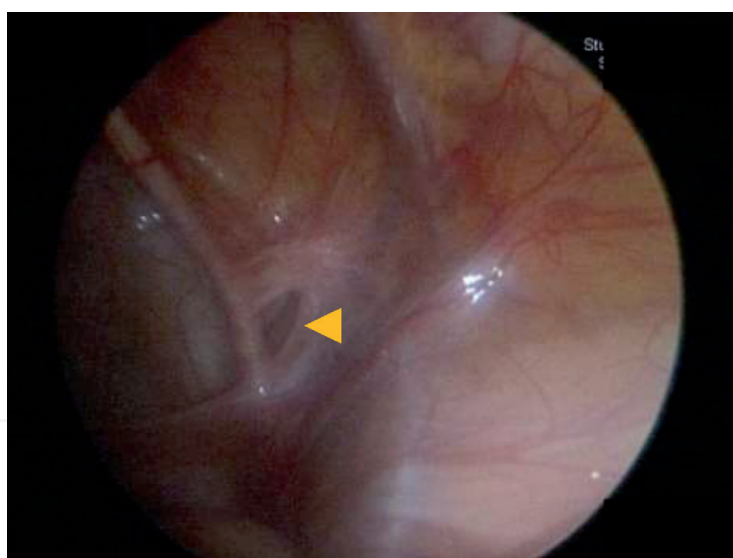


Figure 2.
Laparoscopic finding of femoral hernia at first operation. Hernia orifice presented medially to the epigastric vessels and below the inguinal ligament (arrowhead).

2.2 Case 2

The patient was a seven-year-old girl. She was diagnosed with the right external inguinal hernia and planned for LPEC procedure. Based on laparoscopic findings, we misdiagnosed an internal inguinal hernia (**Figure 2**). Iliopubic tract repair was performed with an open approach. One month after the operation, recurrence of inguinal protrusion was observed, and ultrasonography demonstrated femoral hernia (**Figure 3**). Therefore, the laparoscopic examination was scheduled. Intra-abdominal findings showed that the hernia orifice appeared to be closed, but traction with forceps confirmed the presence of a femoral hernia sac (**Figure 4**).

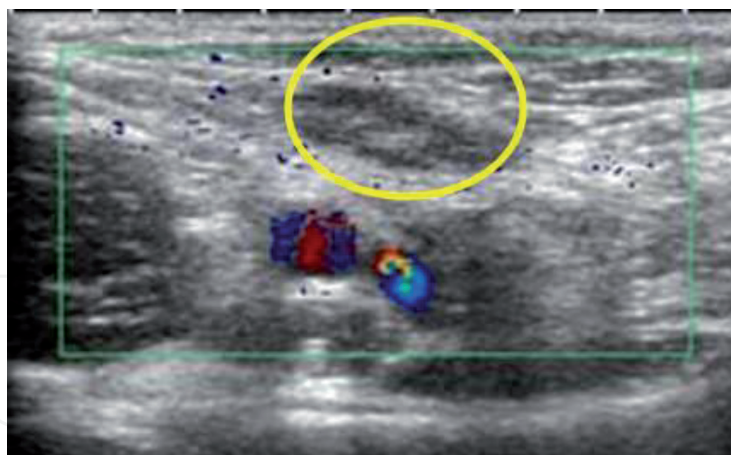


Figure 3.
Ultrasonography of femoral hernia at recurrence. Herniation was recognized caudally to inguinal region and medially to the epigastric vessels (circle).

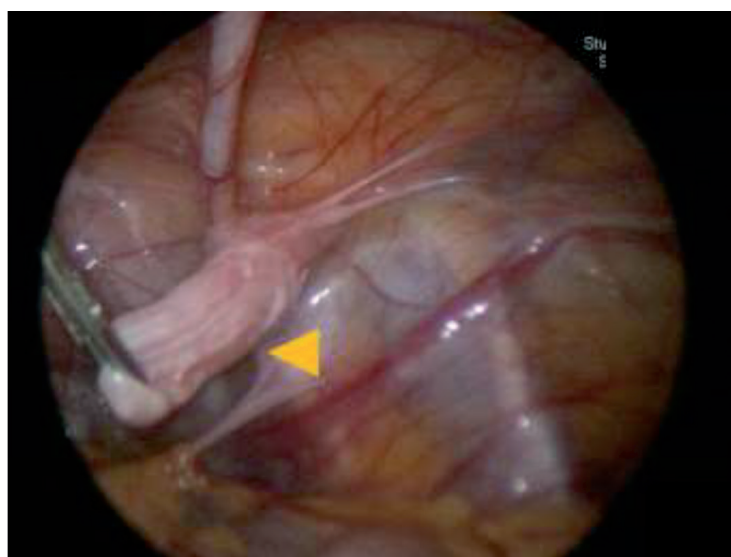


Figure 4.
Laparoscopic finding of femoral hernia at second operation. A hernia sac with fat was identified (arrowhead).

We expected that the second open approach would have strong adhesion, therefore, we chose laparoscopic surgery. The hernia sac with the adipose tissue was resected. The iliopubic tract and Cooper's ligament were exposed and the femoral ring was closed (modified McVay repair).

3. Discussion

Direct inguinal hernia in children is quite rare. The incidence of direct inguinal hernias is as low as 0.2–1.2% of all pediatric inguinal hernias [3, 4]. Direct inguinal hernias seem to occur in males, and the affected side is on the right [4]. Fonkalsrud or other presumed the two or three etiologies of direct inguinal hernia: (1) attenuation of transversalis fascia, (2) increased abdominal pressure, and (3) weakness of the internal inguinal ring due to the previous surgery for indirect inguinal hernia. Wright divides the direct hernia into five based on the findings from the inguinal region [5, 6].

The correct diagnosis rate of indirect inguinal hernia is 38% preoperatively, and diagnosis is often missed even during surgery [5]. Recently, the laparoscopic diagnosis seems to be a feasible choice in this rare condition. In our case, preoperative diagnosis is an indirect inguinal hernia, however laparoscopic findings demonstrated direct hernia during surgery.

The treatment of direct hernia is different in each facility. Some authors recommend Bassini repair [4, 5], and some recommend McVay repair [6]. Laparoscopic closure of indirect hernia is described as an excellent technique for rare hernia. They use the vesical or umbilical ligament to close the direct defect [3, 7, 8]. However, laparoscopic treatment of pediatric inguinal indirect hernia is still controversial, and we performed McVay repair rather than laparoscopic closure to ensure posterior wall reinforcement.

Femoral hernia in children is less than 1% of all groin hernia [9–11]. Previous statements that femoral hernia is equally in males and females [12], and some authors indicated more frequently in boys than girls [13, 14]. A predominance of affected sides reported the right side, however, the cause is not understood [14, 15]. Regarding the etiology of femoral hernia, the most supported hypothesis was described by McVay and Savage [16]. They proposed that a congenital narrow insertion of the posterior inguinal wall onto Cooper's ligament caused an enlargement of the femoral ring.

A femoral hernia is also often misdiagnosed as a direct hernia. The correct diagnosis rate of femoral hernia is 53% preoperatively [17]. Several authors recommended a meticulous physical examination in the inguinal area, and ultrasonography is especially useful to distinguish femoral hernia from indirect inguinal hernia [14, 18]. We misunderstood our case as an indirect inguinal hernia in the first operation. Reconfirming the physical examination, the orifice of hernia was slightly caudal position and ultrasonography demonstrated femoral hernia. Pediatric hernias required a more accurate examination at the first visit.

The advantage of the laparoscopic technique in pediatric hernia includes the accurate diagnosis, minimal pain, and cosmesis. Although laparoscopic repair of femoral hernia was established in adults [19], most pediatric surgeons chose the open approach. In recent years, laparoscopic modified McVay technique reported in children [17, 20]. The laparoscopic approach was performed because of recurrent cases and the possibility of severe adhesion in our case. Laparoscopic closure required more operative time than an open approach. We consider the key to femoral repair is the closure of the hernia orifice without tension, following the resection of lipoma with the hernia sac.

4. Conclusions

Numerous pediatric surgeons have never seen rare hernias, however, in the laparoscopic era, intraabdominal findings revealed more higher rate of rare hernias. Rare pediatric inguinal hernias are challenging to diagnose and treat. In our both cases, the laparoscope approach was useful for diagnosis, however, simple or modified laparoscopic closure is still controversial.

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Conflict of interest

The authors declare no conflict of interest.

Notes/thanks/other declarations

Thanks to my colleagues.

Acronyms and abbreviations

PPV patency of the processus vaginalis
LPEC laparoscopic percutaneous extraperitoneal closure

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