

CASE REPORTS

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# An innovative use of PIRS technique for pediatric femoral hernia: report of 2 cases

Ergun Ergun, Yusuf Alper Kara<sup>\*</sup> , Beytullah Yagiz, Sila Ispir Karalar, Ozlem Balci and Ismet Faruk Ozguner

## Abstract

**Background:** Femoral hernia is very rare in children. Surgical intervention is necessary for treatment. There are many different surgical methods explained before. Laparoscopic single port repair technique is not reported before.

**Case presentation:** A 2.5-year-old girl with left femoral hernia and a 5.5-year-old boy with a right femoral hernia were presented to the hospital with bulging on the groin. Using a 5-mm telescope with optical forceps, the defects of patients were repaired with percutaneous ring suturing technique via spinal needle without excision of the lipoma. No complications developed on the patients in 12 months follow-up.

**Conclusion:** Laparoscopic single port needle assisted repair is a safe and feasible method repairing femoral hernia and excision of the lipoma should be kept in mind to avoid possible recurrences.

**Keywords:** Children, Hernia, Femoral, Laparoscopy

## Background

Femoral hernia is very rare in children and appears with a bulge on the groin [1–3]. Most (two-thirds) are not suspected before operation [1]. Surgical intervention is necessary for treatment. There are different surgical methods as the lower infrainguinal ligament procedure of Lagenback, trans inguinal Cooper's ligament repair (McVay procedure), abdominal extraperitoneal repair (Cheatle-Henry) and laparoscopic repair [2, 4]. Laparoscopic single port needle-assisted hernia repair with percutaneous internal ring suturing (PIRS) technique is frequently preferred to repair inguinal and diaphragmatic hernias [5–9]. The aim of this case is to present laparoscopic single port needle assisted repair of the femoral hernias in 2 children.

## Percutaneous Internal Ring Suturing (PIRS) technique

Under general anesthesia the laparoscopy telescope and optical forceps located into abdominal cavity via umbilical incision after trocar placed. Then, the inguinal defect explored. A 2-mm-incision made the skin at the level of defect. The spinal needle passed through extraperitoneal both sides of the defect and closed extracorporeally.

## Case presentations

### Case 1

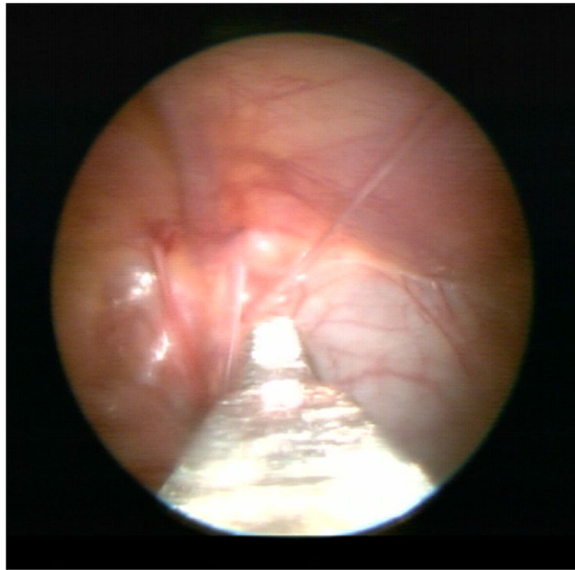
A 2.5 year-old-girl presented to the hospital with a complaint of bulging on the left groin that was noticed 1 day before applying to the hospital. Physical examination revealed a bulging on the left groin. Ultrasound examination was concordant with femoral hernia.

Under general anesthesia, 5-mm trocar placed via umbilical vertical incision. Telescope with optical forceps placed into abdomen through umbilical trocar. Left inguinal and left femoral hernia were detected. There was a 1 × 1-cm lymph node and lipoma at medial side of the hernia. The lipoma has not been excised. Femoral hernia was repaired by percutaneous ring suturing technique via 3/0 non-absorbable suture via 22 G 90 mm-length Quincke tip spinal needle. Then the inguinal hernia

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\*Correspondence: dryakara1024@gmail.com

University of Health Sciences, Dr Sami Ulus Maternity and Children Health and Research Application Center, Alparslan Turkes St. 57, Ankara, Turkey, Yenimahalle



**Fig. 1** Laparoscopic view of femoral hernia after repair

was repaired with the same fashion. There was no other pathology inside the abdomen (Fig. 1).

The follow-up was uneventful for 12 months after the surgery.

#### Case 2

A 5.5-year-old-boy presented to the hospital with a complaint of bulging on the right groin. Physical examination revealed a bulging on the right groin. Ultrasound examination was concordant with femoral hernia.

Under general anesthesia laparoscopic exposure revealed right femoral hernia and the hernia was repaired by percutaneous ring suturing technique with 3/0 non-absorbable suture via 22 G 90 mm-length Quincke tip spinal needle. There was no other pathology inside the abdomen.

The follow-up was uneventful for 12 months after the surgery.

#### Conclusions

Laparoscopic single port needle assisted repair with PIRS technique of a femoral hernia seems a safe and feasible method in children.

Femoral hernia is a rare condition among children [1, 3]. As a result of this condition, there is not a widely accepted single and proven treatment modality in the literature [10].

In addition to conventional open techniques of inguinal hernia surgical repair, there have been many reports regarding the possibility of laparoscopic repair of inguinal hernia since the 1990s [11, 12]. PIRS is claimed to be

a safe treatment method in inguinal hernia repair and preferred frequently [6, 9, 13].

Femoral hernia is also repaired by laparoscopy in adults [14]. As a result of wide defects of adult's femoral region, massive dissection and graft use is needed. In children the approach completely changes. PIRS method has been widely using in pediatric inguinal hernia repair, but also could be preferred to repair femoral hernia due to the smaller size of defect even though it is a direct hernia [15].

In this report, femoral hernias of a 2.5-year-old-girl and a 5.5-year-old-boy were repaired laparoscopically using optical forceps and spinal needle (Fig. 2). The defect was sutured and closed with PIRS technique entirely. After the surgery, the cosmetic outcome was satisfactory, the patients discharged on the same day and there were no complications (Fig. 3).

Limitations of this study is reporting only two patients with a short follow-up period (10–12 months). In this period, there was no complication seen, but the lipoma



**Fig. 2** Optical forceps used in the procedures



**Fig. 3** Postoperative view of incisions

could be excised in the future cases, to avoid possible recurrences. On the other hand, this limitation is a result of disease's rarity.

Laparoscopic single port needle-assisted repair with PIRS method seems to be a safe and minimal invasive method of femoral hernia repair.

#### Abbreviations

mm: Millimeters; PIRS: Percutaneous internal ring suturing.

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#### Authors' contributions

Concept—all of authors. Design—EE, BY, and YAK. Supervision—EE, BY, and IFO. Data collection and/or processing—all of authors. Analysis and/or interpretation—YAK, SIK, OB, and IFO. Literature review—EE, BY, YAK, SIK, and OB. Writing manuscript—BY, OB, and IFO. Critical reviews—all of authors. All authors read and approved the final manuscript.

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#### Availability of data and materials

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#### Declarations

##### Ethics approval and consent to participate

Ethical approval was gained from local ethical committee and written informed consent was obtained from the parents of the patient for participation.

##### Consent for publication

Written informed consent was obtained from the parents of the patient for publication of this case report and accompanying images.

##### Competing interests

The authors declare that they have no competing interests.

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#### References

1. Radcliffe G, Stringer MD. Reappraisal of femoral hernia in children. *Br J Surg.* 1997;84(1):58–60.
2. Snyder C, Escolino M, Esposito C. In: Holcomb AJ, editor. *Inguinal hernia*, in Holcomb and Ashcraft's *Pediatric Surgery*. Amsterdam: Elsevier; 2020. p. 784–804.
3. Fosburg RG, Mahin HP. Femoral Hernia in Children. *Am J Surg.* 1965;109:470–5.
4. Glick PL, Boulanger SC. In: Coran AG, editor. *Inguinal hernias and hydroceles*, in Coran's *Pediatric Surgery*. Philadelphia: Saunders; 2012. p. 985–1001.
5. Shalaby R, et al. One trocar needlescopic assisted inguinal hernia repair in children: a novel technique. *J Pediatr Surg.* 2017;53(1):192–8.
6. Yilmaz E, et al. A novel technique for laparoscopic inguinal hernia repair in children: single-port laparoscopic percutaneous extraperitoneal closure assisted by an optical forceps. *Pediatr Surg Int.* 2015;31(7):639–46.
7. Stone ML, et al. Novel laparoscopic hernia of Morgagni repair technique. *J Thorac Cardiovasc Surg.* 2012;143(3):744–5.
8. Kaya M, et al. Laparoscopic-assisted repair of Morgagni–Larrey hernia by anterior abdominal wall fixation technique. *Ann Pediatr Surg.* 2015;11(1):30–2.
9. Wolak PK, Patkowski D. Laparoscopic inguinal hernia repair in children using the percutaneous internal ring suturing technique - own experience. *Wideochir Inne Tech Maloinwazyjne.* 2014;9(1):53–8.
10. Matthyssens LE, Philippe P. A new minimally invasive technique for the repair of femoral hernia in children: about 13 laparoscopic repairs in 10 patients. *J Pediatr Surg.* 2009;44(5):967–71.
11. Pesta W, et al. Single incision laparoscopic surgery transabdominal pre-peritoneal hernia repair - case report. *Wideochir Inne Tech Maloinwazyjne.* 2012;7(2):137–9.
12. Zallen G, Glick PL. Laparoscopic inversion and ligation inguinal hernia repair in girls. *J Laparoendosc Adv Surg Tech A.* 2007;17(1):143–5.
13. McClain L, et al. Laparoscopic needle-assisted inguinal hernia repair in 495 children. *Surg Endosc.* 2015;29(4):781–6.
14. Yang XF, Liu JL. Laparoscopic repair of femoral hernia. *Ann Transl Med.* 2016;4(19):371.
15. Ollero Fresno JC, et al. Femoral hernia in childhood: review of 38 cases. *Pediatr Surg Int.* 1997;12(7):520–1.

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