

Laparoscopic Flip-Flap Technique Versus Conventional Inguinal Hernia Repair in Children

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ABSTRACT

Background and Objectives: Inguinal hernia repair is one of the most frequently performed pediatric surgical operations. Several pediatric laparoscopic inguinal hernia repair techniques have been introduced. But debate is unresolved regarding the feasibility of laparoscopy for treating pediatric inguinal hernias.

Methods: A retrospective cohort study enrolled 33 patients who underwent congenital inguinal hernia repair by either the new laparoscopic flip-flap technique or conventional open repair. Patients were divided into 2 groups according to the type of surgery: Group A included those who underwent the new laparoscopic technique, and Group B included those who underwent conventional open repair.

Results: Group A comprised 15 patients (mean age, 39 months), and group B comprised 18 (mean age, 44 months). Mean operative time was 47.5 minutes for Group A versus 27.5 minutes for Group B. Intraoperative complications for Group A included 1 case (7%) of vas deferens injury, and 3 cases (20%) in which the flaps were torn during suturing. In Group B, no intraoperative complications were encountered. In both groups, the mean postoperative hospital stay was 5.5 hours. Postoperative follow-up of 3 months revealed recurrence in 4 patients in Group A (27%), while there were no recurrences in Group B.

Conclusion: Our preliminary experience shows unsatisfactory outcomes with laparoscopic flip-flap hernia repair in children. In spite of advancement in the application of laparoscopy in pediatric surgery, conventional open hernia repair is still the gold standard for children, in our experience. Future studies with more numbers and long-term follow-up should be conducted.

Key Words: Inguinal hernia, Children, Laparoscopy, Flip-flap technique, Open repair.

INTRODUCTION

Hernias and hydroceles are common conditions of infancy and childhood, and inguinal hernia repair is one of the most frequently performed pediatric surgical operations.¹

Since the advent of laparoscopy, adult surgeons have applied it to all spectra of surgical diseases including inguinal hernia repair.² With advancements in anesthesia and refinements in laparoscopic instruments, it has become conceivable that application of laparoscopy in pediatric surgical diseases including hernia repair is the next step.^{3,4}

Unresolved debate still exists regarding the benefit of using laparoscopy over conventional open inguinal hernia repair even between laparoscopic surgeons. Although inguinal hernia repair is widely performed in every pediatric surgery department, the use of laparoscopy has not gained wide acceptance due to the benefits of conventional open repair regarding lower morbidity, good cosmesis, and lower rates of recurrence.^{5,6}

Different techniques are being used to tighten up the hernia opening, which vary from a single stitch to a purse string procedure using laparoscopy.⁷ Several published comparative studies and large laparoscopic series³⁻⁶ aim to clarify the feasibility of laparoscopy in pediatric inguinal hernia repair and compare laparoscopy versus conventional repair.

The aim of the current study was to compare various aspects of a recently reported laparoscopic flip-flap technique⁸ with the conventional open inguinal hernia repair in a short-term follow-up.

METHODS

A retrospective cohort study was performed including all children who underwent congenital inguinal hernia repair in the pediatric surgery department of Alwasl Hospital from July 2004 to October 2004 by either the new laparo-

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scopic flip-flap technique described by Yip et al⁸ or conventional open repair. The laparoscopic procedure was performed by the same laparoscopic surgeon.

Laparoscopic Repair Technique

We followed the same steps described by Yip et al.⁸ A 5-mm umbilical port was introduced and a 5-mm 30-degree telescope was used. Another 2 flank ports were introduced under direct laparoscopic guidance, and insufflations ranged from 8 mm Hg to 10 mm Hg. An incision over the peritoneum alongside the anterior and lateral edge of the hernia entry side was made; a peritoneal flap big enough to cover the hernia opening was raised. Blunt dissection was performed beneath the flap. The anterior and lateral half circumference of the sac was detached from the surrounding soft tissue, and the opening of the hernia sac spontaneously collapsed. The vas deferens and testicular vessels were untouched and safeguarded. A 4–0 polypropylene suture was then introduced into the peritoneal cavity through the anterior abdominal wall. The peritoneal flap was flipped medially and anchored with the stitch. The suture was tied intracorporeally. The needle was retrieved through the working port, and the wounds were then closed with absorbable sutures.

The medical records of these patients were reviewed, and patients were divided into 2 groups according to the type of surgery done: Group A comprised those who underwent the new laparoscopic technique, and Group B comprised those who underwent conventional open repair. The following data were collected and analyzed: demographics, hernia site, operative time, intraoperative complications, time of postoperative hospital stay, and postoperative recurrence.

RESULTS

From July 2004 to October 2004, 33 patients underwent inguinal hernia repair. All patients were male, and the age ranged from 4 months to 7 years (mean, 44 months).

Group A included 15 patients (mean age, 39 months), while Group B comprised 18 patients (mean age, 44 months). Five patients had bilateral hernias in Group A versus 7 patients in Group B (all of them had bilateral repairs).

Operative time for Group A ranged from 40 minutes to 55 minutes (mean, 47.5). In Group B, operative time ranged from 20 minutes to 35 minutes (mean, 27.5). The calculated time excluded time consumed for any technical problems with the laparoscopic instruments.

In Group A, intraoperative complications included 1 case (7%) of vas deferens injury during mobilization of the flaps, and in 3 other cases (20%) the flaps were torn during suturing, which necessitated multiple sutures to close the defect. However, in Group B no intraoperative complications were encountered.

In both groups, the range of postoperative hospital stay was from 3 hours to 8 hours (mean, 5.5).

Postoperative follow-up of 3 months revealed recurrence in 4 cases in Group A (27%), and no recurrences were encountered in Group B.

DISCUSSION

The inguinal hernia repair is the most frequently performed procedure in children. Failure to close the processus vaginalis accounts for nearly all the inguino scrotal abnormalities seen in infancy and childhood. The concurrence rate of recurrent inguinal hernia after uncomplicated inguinal hernia conventional open repairs is generally reported at 0.5% to 1%, increasing for premature infants and complicated inguinal hernia.⁹

With advances in minimally invasive surgery,¹⁰ inguinal hernias have been treated routinely by the laparoscopic method in some centers. However, from the technical point of view, the procedure remains in its early evolution.⁶

Recurrence for laparoscopic pediatric inguinal hernia repair is approximately 4%, which is higher than recurrence for conventional open repair.⁹ Several technical modifications have been reported aiming to reduce the high recurrence rate after laparoscopic repair. Chan and Tam¹¹ advised normal saline injection at the extraperitoneal space to separate the vas deferens and testicular vessels from the peritoneum. They emphasize the importance of using a “needle” sign. Also they highlight the importance of application of the “complete ring” sign in laparoscopic repair to lower the recurrence rate. Care still is needed to prevent hematoma formation with this procedure, thus avoiding recurrence.¹¹

Schier¹² initially performed laparoscopic hernia repair only in girls for fear of damaging the vas deferens and testicular vessels in boys. After refining his technique by using interrupted stitches to close the internal ring, thus avoiding this risk, he included boys for this operation.¹³ However, optimal spacing is difficult in the placement of interrupted stitches. Too wide a space can lead to recur-

rence, whereas too narrow a space near the vas deferens or testicular vessels can cause obstruction.⁶

Prasad et al¹⁴ recently described the use of a 1.7-mm needle laparoscope, and a special curved stainless steel awl introduced percutaneously anterolateral to the internal ring for childhood hernia repair. This method still has the difficulty of separating the vas deferens and testicular vessels from the peritoneum, and the risk of damaging these important structures persists.

Yep et al⁸ published a new laparoscopic technique in which the hernia opening was repaired with a peritoneal flip-flap anchored with a single tension-free intracorporeal suture. The vas and testicular vessel were completely untouched. The valve mechanism of the flip-flap helped to avoid scrotal collection and prevent hernia recurrence.⁸

The operative time was shorter in the open group than in the laparoscopic group, and the learning curve did not change the time which is comparable to that of the open technique due to the meticulous dissection required to create the flaps; however, even this caution did not guard against tearing of the flaps in 3 cases.

Intraoperative complications in the open repair were nil in comparison with complications in the laparoscopic group in which one case of vassal injury occurred during creation of the flaps, and in 3 cases the flaps were torn during stitch fixation, which required closure of the internal ring by multiple stitches.

Postoperative hospital stay was nearly the same in both groups, and all the patients were discharged the same day. Meanwhile, the postoperative analgesic requirements also did not differ in both groups, and this may be attributed to our policy of routine preemptive analgesia with nonsteroidal anti-inflammatory medication.

We did not encounter any postoperative recurrence in the open group in the 3-month follow-up, while 4 cases of recurrence occurred in the laparoscopic group.

From our experience, the operative time was longer in the laparoscopic group. Intraoperative complications and postoperative recurrence in the laparoscopic flip-flap technique were a major problem discouraging wide use of this new technique in comparison with the satisfactory results obtained by conventional open repair from all aspects including good cosmetic appearance and lower rate of recurrence.

Although the incidence of contralateral hernia remains controversial,^{15,16} the advantage of using laparoscopy for inguinal hernia repair to diagnose the contralateral side

should be associated with comparable results to that of the conventional open repair. Moreover, until we have satisfactory outcomes for laparoscopic hernia repair in children, the open repair remains the gold standard for pediatric surgeons, and other options for managing the contralateral side are still available through either¹ observation and repair of a contralateral hernia only if it later becomes apparent,² routine contralateral groin exploration, and³ laparoscopy to evaluate the contralateral groin for a potential hernia that could be used through the inguinal incision or by using a mini-telescope through the umbilicus.¹⁷

CONCLUSION

Our preliminary experience showed unsatisfactory outcomes with the laparoscopic flip-flap hernia repair in children. In spite of the advancement in the application of laparoscopy in pediatric surgery, conventional open hernia repair is still the gold standard for children in our experience. Future studies with more numbers and long-term follow-up should be conducted.

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