Research Article

DOI: http://dx.doi.org/10.18203/2349-2902.isj20160257

Management of inguinal hernia in children: a single center experience of 490 patients

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Received: 15 January 2016 Accepted: 27 January 2016

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ABSTRACT

Background: To evaluate 490 consecutive children who underwent hernia repair over a 3-year period. Technical details and clinical results are reported.

Methods: Retrospective study of open and laparoscopic inguinal hernia repair performed in dept. of pediatric surgery, NSCB Medical College, Jabalpur, M.P. during July 2009 to July 2012 was done. The variables evaluated were age, sex, type of inguinal hernia, presence of an associated hydrocele, side of hernia, incarceration, obstruction, strangulation, occurrence of opposite-side hernia, recurrence, and other associated complications and conditions. Correlation between radiology and intraopearative findings was done. A total of 540 open internal rings were closed surgically in 490 children (boys and girls, aged 02 days to 14 years, mean 32 months). 400 cases underwent open repair by standard technique and 90 cases underwent laparoscopic surgery. In laparoscopic technique one 5-mm and two 3-mm instruments were used to access the peritoneal cavity. The internal inguinal ring was closed with a non-absorbable suture or tacker as described in paper.

Results: There were no significant intraoperative complications. Length of procedure ranged between 20 and 50 minutes with a mean of 35 minutes in laparoscopy and 20 min in open surgery. Postoperative hospital stay ranged from 1 to 3 days. Five children who presented with a right-sided hernia and three with a left hernia (total of 8) were found to have a patent contralateral internal ring on laparoscopy. Mean follow-up was 20 months. There were 2 hernia recurrences (0.4%) 1 in open and 1 in laparoscopic group.

Conclusions: Ultrasonography of inguinal region is good adjuvant for diagnosis in doubtful cases. Majority of hernia cases were operated by standard open surgical technique. Laparoscopic hernia repair in children is a safe and feasible technique. There is clear visualization of structures and vas remains untouched and opposite patent ring is seen which can be managed in same setting. As per our experience the recurrence rate is comparable to that of the traditional open approach with a superior cosmetic result.

Keywords: Inguinal hernia, Pediatric, Surgery, Sonography, Laparoscopy

INTRODUCTION

Pediatric inguinal hernias are due to the persistent processus vaginalis. It is diagnosed with the classic clinical feature of a lump that transmits a cough impulse. Less clear-cut clinical presentations such as a "bulge,"

"fullness," and a cough impulse in the absence of a definite lump reduce diagnostic certainty. A patient may also present with pain alone, in which case there is a broad range of differential diagnoses.

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Imaging specially sonography of inguinal region is most important modality in cases with doubtful presentation and also to see the patency of opposite ring. ^{1,2}

Inguinal hernia is the most common indication for surgery in the paediatric age group and the incidence of inguinal hernia in those younger than 18 years old varies from 0.8 to 4.4% inguinal hernia repair in infants is a routine surgical procedure. Conventional inguinal hernia repair in children involves ligation of the hernia sac at the internal inguinal ring. Laparoscopic surgery has been applied in children, and the repair is based on the same principle.^{3,7,9}

However, numerous issues, including timing of the repair, the need to explore the contralateral groin, use of laparoscopy, remain unsettled. Our study aims to answer few of these questions.

METHODS

Duration: July 2009 to July 2012

Type of study: Retrospective

Inclusion criteria

All patients of inguinal hernia of age <14 years.

Exclusion criteria

Patients with hernia with undescended testis, patients age >14 years.

Patients underwent ultrasonography preoperatively with the patient in the supine and erect positions, in a relaxed state, as well as during coughing/crying. All the records were reviewed as per above criteria including preoperative imaging (ultrasonography of inguinal region), intraoperative finding and correlation between the two.

Operative technique

All operations were performed under general anesthesia (GA). The patients placed in a supine position. Open herniotomy was done in standard manner.

Patients who underwent laparoscopic herniotomy, an Umbilical 5 mm port are inserted with open technique and CO₂ pneumoperitoneum is established. The intraabdominal pressure is set at 6-10 mm of mercury. A 5-mm scope is then placed at the umbilicus. Findings are noted. Two lateral trocarless working ports of 3/5 mmmm are made through the right and left pararectal region by stab technique to maintain a triangular orientation.

Sac excision was done for hernia more than a bubonocele. In cases with small defects, laparoscopic ring closure was done with 3-0/4-0 Polyglactin 910/

nylon/prolene, introduced directly through the anterior abdominal wall. In extracorporeal knotting technique suture is retrieved with a port closure needle and tied outside followed by placement of knot subcutaneously. An extra medial suture was taken including lateral umbilical ligament to reinforce the repair. A similar procedure was performed on the contra lateral side, if found to be patent. Liquids can be started after 12 hours and solids after 18 hours and patients are discharged after 24 hours.

RESULTS

Table 1: Side of hernia.

Side of hernia	No.	Percentage
Right	318	65%
Left	122	25%
Bilateral	50	10%
Total	540	

Bilateral hernia cases include 8 cases of patent processus vaginalis noted intraoperatively in laparoscopy.

Table 2: Correlation between imaging and laparoscopy contralateral patent ring.

Sr. No.	Contralateral patent processus vaginalis detected
Ultrasonography	5
Laparoscopy	8

Table 3: Intraoperative and perioperative outcome.

Sr. No	Parameters	Open (n = 400)	Lap (n = 90)
1	Operative Time in minutes	20 min	35
2	Recovery		
	<3 hrs	380 (95 %)	72 (80%)
	>3 & <6 hrs	20 (5%)	18 (20 %)
3	Discharge		
	<24 hrs	384 (96%)	54 (60%)
	>24 hrs	16 (4%)	36 (40%)
4	Cosmesis		
	Excellent	80 (20%)	72 (80%)
	Good	320 (80 %)	18 (20%)

A total of 540 open internal rings were closed surgically in 490 children (boys and girls, aged 02 days to 14 years, mean 32 months). 400 cases underwent open repair by standard technique and 90 cases underwent laparoscopic surgery. The ages ranged from 02 days to 14 years with a male-to-female ratio of 2.5:1 (294 males and 196 females). 65% right, 25% left, and 10% bilateral hernias (Table 1). Hydroceles were present in 7% associated hernias. Five children who presented with a right-sided hernia and three with a left hernia (total of 8) were found to have a patent contralateral internal ring on laparoscopy, of these 5 patients were suspected on

preoperative ultrasound to have patent ring on the basis of >4 mm diameter of internal ring, the presence of fluid or organs in the inguinal canal at rest or during straining (Table 2). Incarceration occurred in 8.7% of children. No emergency surgical intervention was required in incarcerated cases, all of which were operated on electively after 3 to 5 days following manual reduction. Intraoperative and perioperative outcome were evaluated (Table 3).Our recurrence rate was 0.45%. There was a 0.2% wound infection rate (Table 4).

Table 4: Outcome of operated patients.

Complications	No.	Percentage
Wound complications	3	0.5%
Hydrocele	2	0.4%
Recurrence	2	0.4%
Testicular atrophy	1	0.2%
Others	0	0

DISCUSSION

Inguinal hernia occurs in 0.8–4.4% of children, and are unilateral in 75–90%. ^{1,2} Incidence is higher in premature infants. ⁴ All inguinal hernias are repaired to avoid the risk of incarceration of bowel and gonadal infarction and atrophy. However, these risks must be balanced against the risk of potential operative and anesthetic complications. ^{2,4}

As symptoms may be multifactorial and history may be ambiguous or misleading, a protocol-driven evaluation with ultrasound is recommended so that better preoperative diagnosis can be made. US is a noninvasive, readily available, and highly accurate (97%) method for evaluating the presence of inguinal hernia in children at risk, especially when the clinical findings are equivocal or normal. US can provide an objective measure in determining the advisability of exploratory inguinal surgery in such cases. 12

The pooled incidence of metachronous contralateral hernia after unilateral inguinal hernia repair is 7.3%. If the contralateral side is evaluated with laparoscopy or ultrasound, a contralateral patent processus vaginalis (CPP) is found in about 30% of patients. The utility of contralateral inguinal exploration in children is an area of active debate. The rationale for attempting to diagnose a contralateral PPV is that repair can be performed to prevent any potential contralateral incarceration with no additive anesthetic risk. Although contralateral repair in patients with CPP may reduce the incidence of MCH, such a strategy will result in significant overtreatment since a majority of these patients will not develop clinical MCH.

The literature suggests that laparoscopically identified CPP is a poor indicator of future contralateral hernia. Almost a third of patients will have a CPP, while less

than one in 10 will develop MCH when managed expectantly. Performing contralateral hernia repair in patients with CPP results in overtreatment in roughly 2 out of 3 patients. 8,11

Our reported hernia recurrence rates are comparable to those associated with open repair. However, data regarding the risk of testicular atrophy are not available as it needs long term follow up. 11

CONCLUSION

Majority of hernia cases were operated by standard open surgical technique. Laparoscopic hernia repair in children is a safe and feasible technique. There is clear visualization of structures and vas remains untouched and opposite patent ring is seen which can be managed in same setting. As per our experience the recurrence rate is comparable to that of the traditional open approach with a superior cosmetic result. There is no consensus on when or if contralateral inguinal exploration is necessary. A randomized trial with more number of patients is needed to answer these questions.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

institutional ethics committee

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Cite this article as: Acharya H, Agrawal R, Agrawal V, Tiwari A, Chanchlani R. Management of inguinal hernia in children: a single center experience of 490 patients. Int Surg J 2016;3:345-8.