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SINGLE PORT LAPAROSCOPIC CONGENITAL INGUINAL HERNIA REPAIR

General Surgery

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ABSTRACT

Aim and Objectives: The present study was undertaken to evaluate the effectiveness of single port laparoscopy incongenital inguinal hernia repair with respect to operative time, intra and postoperative complications, hospital stay and rate of recurrence. **Materials And Methods:** Total 30 patients of age between 2-15 years admitted with diagnosis of congenital inguinal hernia, unilateral or bilateral hernia, with reducible non obstructive, primary were included in the study. All cases were performed under general anaesthesia by using a modification of technique described by Ozgediz et al. **Results:** Among 30 patients, 25 (83.3%) were male and 5 (16.7%) were female. Maximum numbers of patients were in the age group of ≤5 years (56.7%) with mean age of patients was 6.39 ± 3.43 years. Most of the patients (17; 56.7%) had right inguinal hernia. Mean operative time required was 16.23±4.39 minutes. Only in one patient (3%) extra port placement needed to reduce the contents of hernia. Intra operatively, one patient (3.3%) had retro peritoneal hemorrhage and post operatively one patient (3.3%) had complained of nausea for some hrs. The mean hospital stay was 1.48±0.58 Day. There was no recurrence occur in any case. **Conclusion:** In the paediatric population, single port laparoscopic inguinal hernia repair can be performed safely. This enables extension of the advantages of reduced access surgery to patients with limited resources to be handled. It also incorporates the benefit of being fast, shortened operating time and better cosmesis. The benefit of limited instrumentation and the intracorporeal knotting avoidance makes this a feasible technique.

KEYWORDS

Laparoscopy, Congenital, Inguinal hernia, Anaesthesia Hemorrhage, Recurrence, Paediatric

INTRODUCTION

Inguinal hernia seems to be the most frequently encountered condition in children.[1] Around four hundred years ago a French surgeon called Ambroise Pare described the reduction of a pediatric hernia incarcerated and the use of trusses. He acknowledged that children's inguinal hernias were possibly congenital in nature, and that they could only be surgically treated. [2] While it is unclear the precise prevalence of inguinal hernia in infants and children, the recorded occurrence varies from 1-5%, influencing 1-2% of mature infants. Premature babies have an elevated risk of inguinal hernia, with occurrence rates of 2% for females and 7-30% for males. Approximately 5 per cent of all males during their lifespan develop a hernia. Mostly on right side 60 per cent of hernias occurs.[3]

Most pediatric inguinal hernias need surgical care to avoid complications such as inguinal hernia incarceration or strangulation from occurring.[2] The laparoscopic ligation of the hernia sac has been commonly used in medical procedure and numerous techniques have been created by different teams.[4,5] We may exit certain pitfalls, such as complicated procedure and specialized equipment; however, there are unusual records of a large wide variety of clinical cases of single-port laparoscopic inguinal hernia repair. Since June 2009, several pediatric inguinal hernia cases have been diagnosed and treated with some special method employing single-port approach, and good results have been obtained.[6] The current work has been conducted to evaluate the efficacy of single port laparoscopy in congenital inguinal hernia repair in terms of operating time, intraoperative and postoperative complications, hospital stay and risk of recurrence.

MATERIALS AND METHODS

The present prospective research was carried out in the Department of Surgery, Mahatma Gandhi Mission Medical College and Hospital, Aurangabad during the period from June 2014 to November 2016, after obtaining the approval of the Institutional Ethics Committee. The study included a total of 30 patients aged 2-15 years of age admitted with diagnosis of congenital inguinal hernia, unilateral or bilateral hernia, with reducible non-obstructive. Patients with lower abdominal surgery history, severe chest disease, unsafe for general anesthesia, recurrent hernia, and complications such as strangulation were removed from the study.

The procedures have been carried out under general anaesthesia. A modification has been used to the technique defined by Ozgediz et al.[6] The patient was put in the position of a reverse Trendelenberg, with the monitor stationed at the table's foot end and to his right. A single prophylactic dose of Cefuroxime Injection was administered. Pneumoperitoneum was formed by a closed method using a Veress needle, and the pressure was maintained between 10-12 mm Hg. A 5 mm, 30^0 laparoscope was inserted via an umbilical port, and the internal ring (IR) was visualized to validate the patent processus vaginalis. On the other hand, the internal ring was then visualized to pick up an occult Patent processus vaginalis if any. The size of the internal ring was determined approximately by the ease by which it might be reached by the 5 mm scope.

After the internal ring was located, a 2-mm stab incision was made using No. 11 blade. Working from right to left, a 2-0 vicryl suture swung onto a 30 mm curved round body needle was introduced through this stab incision [Figure1a] and the hernial sac neck was encircled extraperitoneally, there is a need to letrav peritoneum only then to skip over the coalescence of the vas and testicular vessels atits **[Figures 1b and 1c].** The needle was then pulled out through the skin on the opposite side of the inner ring, slightly lateral to the lower epigastric vessels (IEV), and then backed up over the upper part of the ring in a plane just above the peritoneum **[Figure 1d]**. The needle was cut and the suture knotted, cut and the skin raised the knot to sink in. The encirclage was begun only laterally to Inferior Epigastric Vessels and similarly followed for a left-sided hernia.

Patient were started on oral feeds after 4 to 6 hours, mobilised and discharged after 12 hours monitoring. Patients were advised for follow up on second and fourth week.

OBSERVATIONS AND RESULTS

A total of 30 patients with diagnosis of inguinal hernia unilateral orbilateral were enrolled in the study, among them 25 (83.3%) were male and 5 (16.7%) were female.The mean age of patients was 6.39 ± 3.43 years, ranging from 2 – 15 years. Maximum numbers of patients were in the age group of ≤5 years (56.7%) as shown in table 1.

Table 1: Distribution Of Patients According To Age Group

Age group (Years)	No. of patients	Percentage
≤5	17	56.7%
6-10	09	30%
>10	04	13.3%
Total	30	100%

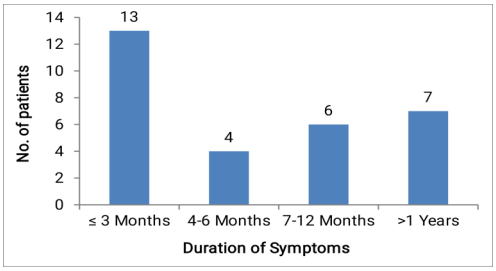

Figure 1: Distribution Of Patients According To Duration Of Symptoms

Out of 30 patients, 17 patients (56.7%) hadright side inguinal hernia, 9 patients (30%) had left side inguinal hernia and 4 patients (13.3%) had bilateral inguinal hernia.Patients were divided in groups according to IR size.16 patients (53.3%) had IR size ≤10mm, 11 patients (26.7%) had IR size between 11mm to 15mm and 7 patients (23.3%) had IR size >15mm.Distribution of patients according to duration of symptoms are shown in F**igure 1**.

Mean operative time taken in study group was 16.23±4.39 minutes, operative time ≤15 min in 18 (60%) cases and > 15 min in 12 (40%) cases.Mean hospital stay in present study groupobserved was 1.48±0.58 Day.

Table 2: Distribution Of Patients According To Operative Time And Post-operative Stay In Hospital

Operative Time	No. of patients	Percentage
≤15 min	18	60%
>15 min	12	40%
Total	26	100%
Post-operative stay	No. of patients	Percentage
1 Day	20	66.7%
2 Day	08	26.7%
3 Day	02	6.7%
Total	26	100%

Only in one patient extra port placement needed toreduce the contents of hernia which was only 3% in 30 patents.Intra operatively, one patient (3.3%) had retro peritoneal hemorrhage.Post-operative complaints observed for vomiting,nausea, shoulder pain or any other in that only one patient (3.3%) had complained nausea post operatively for some hrs.

DISCUSSION

Pediatric inguinal hernias are common in pediatric surgery and these kinds of hernias frequently occur in children under one year of age , particularly in a few months of birth, and male-to female ratio is approximately 15:1. About 60 percent of inguinal hernias occur on the right side and around 10 percent of bilateral hernias occur in all cases.[7,8,9] In present study, the male-to female ratio was about 5:1, in which the trend of sex ratio was consistent with the study done by Chen et al.[5] Male susceptible is concerned with gender anatomy.

One important benefit of laparoscopic techniques in paediatric hernias is the ability to pick up occult Patent Processus Vaginalis while avoiding metachronous hernias. The recorded rates of occult Patent Processus Vaginalis are 23-37 per cent in literature.[6,10] Nevertheless, about 16.66 percent of cases in the present series had an occult Patent Processus Vaginalis. Compared with most of the other series where there were neonates and preterm infants, this can be clarified by the reasonably older children in our series. Up to 40% of Patent Processus Vaginalis is considered to close by 2 months and 60% by two years of age. The conditions used to fix occult Patent Processus Vaginalis are whether it is is more more than 2 mm or if the sac is more than 1.5 cm wide.[6,11] An analysis of the literature has shown that the processus vaginalis closes faster on the left than on the right. Therefore, if there is a left-hand hernia, there are more chances of a patent processus vaginalis on the right.[12]This conclusion was verified in our research in which all occult Patent Processus Vaginlis cases were correlated with left-sided hernias and this was considered statistically significant. Another benefit is the capability to treat synchronous hernias only through a single incision.

A total of 6 bilateral hernias were repaired with success. In one case, however, irreducible omentocoele needed an additional port to be put in order to minimize the contents before the repair could be carried out. The oldest cases in our collection, a 13-year-old boy was handled successfully using this technique.[7] One of the purposes of this method will be to reduce operating times. The median operating time recorded in a 3-port technique is about 20 min in the best of hands.[13] In our study the mean operating time was 13.20 min for a unilateral hernia and 20.66 min for a bilateral repair. The same has been recorded in another series, 15 and 25 min, respectively.[14] All the other paediatric inguinal hernia repair techniques will be measured against the open herniotomy gold standard rates. The recorded rate of recurrence in children for open herniotomy ranges from 2-6.3 percent.[15-17] The same varies from 0-5.3 per cent in laparoscopic 3 port techniques.[13,18-20] The recurrence rates for the recorded single port techniques are 0- 4.8 per cent.[7,14,21] The recurrence in our series is zero percent.

When we look at the simplicity of this method, there is no doubt that it has a learning curve but it is a fairly short one in the authors' view. Operating times and recurrence rates should be indicative of the learning curve gradient as the number of cases increases. Looking at unilateral repairs in our study, all cases had an average operating time of 10 min. Operating periods average 24 min for bilateral hernias. Of a recurrence rates reported in the literature in one series, 5/13 recurrences taken place during the first 4 months and only 2 in the last 100 cases.[6] In the first 35 cases, 5/7 recurrences happened in another series and only 2/7 in the last 77 cases occurred..[14] In our series there is no recurrence occur in any case.

Our series did not conversion to open procedures. The technique can therefore be picked up easily, and can be done with a reasonable amount of convenience, ease and good performance. Looking at the risks, every laparoscopic procedure's additional issue is the need for trans-peritoneal access and the associated risk of visceral / vascular injury. The prevalence of minor and major complications in a series of laparoscopic procedures to determine the risk of needle and trocar injuries was 0.41 percent and 1.58 percent.[22] Fortunately, in our series we had no such complications.

In one case (3.3 percent) one of the smaller veins was injured when navigating the internal ring, resulting in a minor retroperitoneal haemorrhage, which was easily managed by deflating the pneumoperitoneum and exerting pressure outside through the anterior abdominal wall. The pneumoperitoneum was eventually recreated, and the operation completed. Another possible complication can occurs when navigating the internal ring leading to injury to Inferior Epigastric Vessels, but no such complications have been encountered. No patients had any noticeable complications during the postoperative phase, and were discharged the next morning. While they were technically fit being sent home the same evening, this was not achieved because of logistical issues with the parents coming from distant, remote areas with conveyance issues and also because of administrative reasons.

In the follow-up phase, hydrocoeles are a well-known problem that can occur and the cause for this may be either a persistent distal sac that causes the fluid to accumulate exacerbated by the small defects left behind by 'skipping over' the vas and vessels that act as a 1-wayvalve or additional tissue in the purse string suture around the peritoneum.[6,14] However, it was observed that most of these hydrocoeles are self-resolved and only occasionally involve a second procedure.[6] In any event, our postoperative hydrocoele sequence did not occur. Many complications identified for this technique are suture abscess and granulomas. [6,14] We did not experience such a single complication, however. There are also concerns about injury to the femoral and ilio-inguinal nerve injuries and testicular atrophy secondary to testicular artery injury that may occur but we have not found any such cases.[6,11] Additionally, there was no noticeable damage to the sperm cord. Needless to say, the parents find the cosmesis outstanding with just one 5 mm incision at umbilicus, the scar of which after a few months is unnoticeable.

CONCLUSION

In the paediatric population, single port laparoscopic inguinal hernia repair can be performed safely. This enables extension of the advantages of reduced access surgery to patients with limited resources to be handled. It also incorporates the benefit of being fast, shortened operating time and better cosmesis. The benefit of minimum instrumentation and the intracorporeal knotting avoidance makes this a feasible technique.

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