



ORIGINAL RESEARCH PAPER

Paediatric

SPINAL NEEDLE ASSISTED LAPAROSCOPIC CONGENITAL HERNIA SURGERY IN CHILDREN, ONE OF THE BEST COSMETIC ALTERNATIVE APPROACH:- PROSPECTIVE CASE SERIES OF 22 PATIENTS

KEY WORDS: Laparoscopic Paediatric inguinal hernia repair, Laparoscopic Percutaneous Extra Corporeal Closure (LPEC), Needle Assisted Laparoscopic Repair (NALR)

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ABSTRACT

Open Herniotomy has been the timely approved and well accepted surgical treatment for congenital inguinal hernias in children. Laparoscopic surgery has recently emerged as an alternative but wider adoption of laparoscopic surgery remains controversial sometimes due to lack of facilities or lack of hands on experience. But due to advances in anaesthesia and surgical techniques, more advanced techniques with better cosmetic results can be performed in paediatric age groups also. In this prospective study we have performed Spinal needle assisted laparoscopic congenital hernia repair on 22 children (8 Boys & 14 Girls) from age group 1 year to 7 years. Operative time, intra and postoperative complications, postoperative pain, hospital stay and cosmetics aspects were recorded and compared for difference in outcome. Patients were followed for an average of 12 months to evaluate the outcomes.

1. INTRODUCTION

Congenital Inguinal hernia is one of the most frequently performed operations in infant and children. Open Herniotomy has been the timely accepted treatment for congenital inguinal hernia worldwide. With advances of recent treatment modalities Laparoscopic surgery has recently emerged as an alternative in recent years for paediatric surgery. Laparoscopic hernia repair is routinely performed in many centres and its efficacy and safety are well documented. Recently a unique technique of extracorporeal circuit suturing of congenital inguinal hernia defects using a minimally invasive technique by a needle assisted one also known as Laparoscopic Percutaneous Extra Corporeal Closure (LPEC) or Needle Assisted Laparoscopic Repair (NALR) has been incorporated in abroad countries. Almost very few literature references are available from India. Herewith we are presenting largest series of 22 patients got operated with same technique highlighting the pros and cons of the procedure. The aim of the study is to evaluate the feasibility, efficacy, and safety of the procedure in randomly selected cases in comparison with the open surgery.

2 MATERIALS AND METHODS:

In this prospective study 22 children underwent Spinal needle assisted laparoscopic congenital hernia repair on 22 children (8 Boys & 14 Girls) from age group 1 year to 7 years (Fig.1), randomly selected presented with unilateral or bilateral inguinal hernias. All procedures were done under general anaesthesia after following routine preoperative protocols and fitness and due consent of parents. 5 mm camera port is inserted through supraumbilical incision. Internal ring identified to confirm the patent process vaginalis and look for contralateral occult hernia. A 22 G spinal needle along with 2/0 prolene loop was inserted through a small stab incision which was marked in the groin skin over the internal ring. Spinal needle was manipulated around the internal ring to transfix the ring by taking small bites of peritoneum by lifting it with grasper. Extreme care was taken to avoid damage to vas deferens and gonadal vessels at this stage in male patients. The prolene loop was brought out after completing the circumferential bites of internal ring. Once the loop has entered into the peritoneum, needle was taken out and reinserted from lateral margin of internal and free end of the thread is passed entering into the loop. Loop was gradually

pulled out and complete encircling thread around the deep internal ring. The suture was tied in an extracorporeal manner and was buried under the skin (Fig.2, Fig.3, Fig. 4). Port incision was sutured with vicryl 3/0 suture. The small punctured wound in groin was closed with steristrip. The following steps are shown in fig. The pros of the procedure include very good cosmetic No scar surgery, very good alternative technique for bilateral female inguinal hernias, Same hospital stay as conventional open inguinal herniotomy. In boys, the main limiting factor was avoiding the vas and vessels (Cord structures). Trauma to cord structures can be minimised by using spinal needle which has less traumatic needle tip. Hernial sac with huge defect more than 3 cm after intra-abdominal insufflation of CO2 were difficult to encircled with this technique and chances of recurrent hernia are high. Use of prolene material was easy to encircle around the hernial defect but the chances of slippage of knots are more if knots are tied loose. Vicryl material was also tried but multifilament threads cause difficulty to get encircled smoothly around the hernial sac and chances of cord structures getting trapped in the thread are more. So, we predominantly used only Prolene 2-0. All the patients were discharged on the same day and called for follow-up visits at 2 weeks, 1 month, 3 months and 12 months. During follow-up, outcome measurements such as scrotal oedema, postoperative hydrocele formation, recurrence rate and cosmetic results were evaluated. 3 boys with huge hernial sac (defect more than 3 cm) got recurrence of hernia due to slippage of prolene knot confirmed on re exploration. All patients with recurrent hernia were operated with conventional open herniotomy. No recurrence was found in female patients.

TOTAL PATIENTS NO : 22

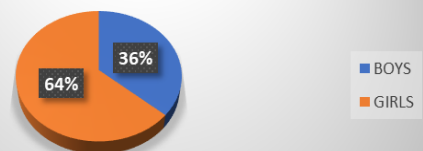


Fig:1

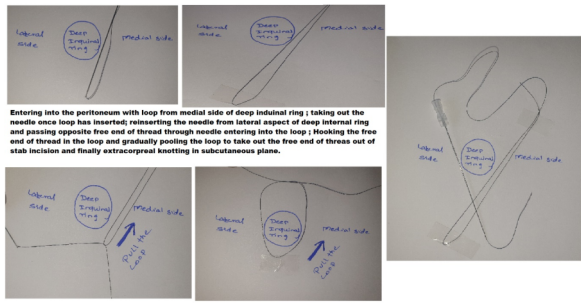


Fig. 2

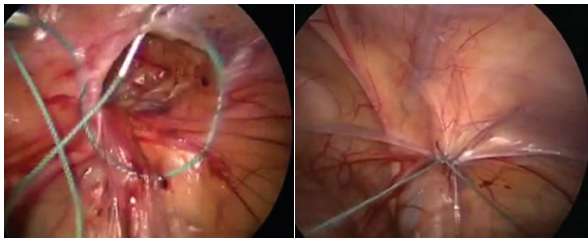


Fig. 3

Fig. 4

3 DISCUSSION:

Indirect inguinal hernia is common in paediatric population due to the persistence of peritoneal reflection providing a passage for testicular descend from abdomen to scrotum. A number of risk factors have been implicated in its development like prematurity, low birth weight, undescended testis, lung disorders and use of ventilator for mechanical ventilation (1). The most dangerous complication of inguinal hernias in children is their risk of incarceration and strangulation, the risk of which is highest in the infant period (2). In paediatric, conventional open herniotomy technique is universally accepted technique which is limited to ligation of hernia sac at the internal inguinal ring (3). Dissecting hernial sac from cord structures to reach the deep inguinal ring bears potential risk of damaging the vas deferens, haematoma formation, damage to testicular artery specially in paediatric age group where hernia sac is very fragile. Laparoscopic repair of hernia in children has been widely accepted as an alternative method of treatment and is rapidly gaining popularity endorsing its feasibility, efficacy, and safety. Advantages of laparoscopic repair include excellent visual exposure, ready evaluation of the contralateral side, minimum dissection and avoidance of injury to vas and vessels and iatrogenic ascent of the testis, and decreased operating time especially in obese child and in recurrent cases. Ozgediz et al provided the idea of minimal instrumentation with extracorporeal knotting in laparoscopic inguinal hernia repair thus making this minimally invasive surgery more minimally invasive and simple (4). Laparoscopic inguinal hernia repair has been found to be highly effective and safe in children because of less trauma of access, less dissection, decreased postoperative pain, less bleeding and early resumption of daily activities (5). Different laparoscopic techniques of inguinal hernia repair in children have been described. Schier (1998) used 2-mm instruments without a trocar for intraabdominal suturing of the IIR in 25 girls by the placement of two Z-sutures with good result (6). Lee and Liang performed microlaparoscopic high ligation of IIR in 450 patients with good results and low recurrence rate (0.88 %) (7). Shalaby et al. used Reverdin needle (Martin Medizin Technik, Tuttlingen, Germany) for extracorporeal ligation of the IIR in 187 groin hernias in 150 patients with superior results over intracorporeal techniques. Shalaby et al. had further compared the intracorporeal purse string suture with extracorporeal closure using Reverdin needle (RN). Laparoscopic hernia repair by RN resulted in a marked reduction of operative time and excellent cosmetic results

with low recurrence rate (8). With the technique we used a spinal needle which is readily available for encircling the deep inguinal ring around the patent processus vaginalis. This method does not need any special needle or hook and can be performed by a surgeon with basic laparoscopic skill without knowledge of intracorporeal knotting techniques. Available literature search revealed that a similar method which was described by Tatekawa in 2012 by the use of an epidural needle and preperitoneal hydro-dissection to separate the vas and vessels (9). We believe that complete encirclement of the ring, emptying the sac, and reducing the abdominal pressure before tying may help in reducing hydrocele formation and recurrence of hernia. We have not encountered any hydrocele during the 6month follow-up.

Due to learning period, we took longer time at the beginning but it is significantly reduced at present (from 25 to 10 min). Contralateral exploration for patent processus vaginalis (PPV) remained a controversial topic. But during laparoscopy, it becomes obvious automatically.

RESULTS:

In this prospective study we have performed Spinal needle assisted laparoscopic congenital hernia repair on 22 children (8 Boys & 14 Girls) from age group 1 year to 7 years. 3 boys with huge hernial sac (defect more than 3 cm) got recurrence of hernia due to slippage of prolene knot confirmed on re exploration. All patients with recurrent hernia were operated with conventional open herniotomy. No recurrence was found in female patients.

CONCLUSIONS:

We conclude that this technique is simple, safe, and efficacious for paediatric inguinal hernia repair. It does not need any special equipment and the procedure can be performed by surgeons with basic laparoscopic skill. There is no need of laparoscopic dissection of hernial sac. Spinal needle 22 G is best as its tip less traumatic and Prolene 2-0 suture material can be easily passed through. Monofilament material is preferable than multifilament material as chances of entrapment of cord structures into the knot is less.

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