

# LAPAROSCOPIC NEEDLE ASSISTED REPAIR OF INGUINAL HERNIA USING SPINAL NEEDLE

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## ABSTRACT

**Objectives:** To know the outcome of Laparoscopic Needle assisted repair of inguinal hernia using spinal needle.

**Material and Methods:** Retrospective chart review was carried out in pediatric surgery unit of the Khyber Teaching Hospital, Peshawar-Pakistan from may 2015 to july 2017. One hundred and forty four single incision laparoscopic needle assisted repair (LNAR) performed on 105 patients. 30 degree telescope of 3mm was used through a supraumbilical port to complete hernia repair and to examine contralateral, deep inguinal ring (DIR) as well. Using non absorbable suture in spinal needle of 22G DIR was encircled extraperitoneally and extracorporeal knot was taken in subcutaneous plan to close the ring.

**Results:** One Hundred and forty four single ports LNAR performed on 105 patients. 9 patients had bilateral inguinal hernia and 30 patients had contralateral patent processus vaginalis (CPPV). Age ranges from one month to 16 years with a mean age of  $3.7 \pm 2.7$  years. Gender distribution shows, male 79% (83 out of 105) and female 21% (22 out of 105). Mean weight of patient's  $10.2 \pm 5$  kg. Preoperative Laterality, unilateral IH was in 91.2% and bilateral IH 8.8%. CPPV was detected in 28% (30 out of 105). Operative time for unilateral hernia repair  $10.18 \pm 2.73$  min and bilateral hernia repair  $16.38 \pm 3.28$  min. Mean length of hospital stay (LOHS) was  $31.79 \pm 6.08$  hours. Analgesia doses required in unilateral cases were  $5 \pm 1$  doses while in bilateral  $7.17 \pm 1$  doses. The hernia recurrence and hydrocele was recorded in 2.8% and 0.95% cases respectively. Wound infection and testicular atrophy rate is 0% in this short series.

**Conclusion:** Single port laparoscopic repair of inguinal hernia using a spinal needle with non-absorbable suture is a safe and effective method having a comparable postoperative complication rate.

**Key words:** Laparoscopic Needle Assisted Repair (LNAR), laparoscopy, pediatrics, Patent Procesus vaginalis (PPV).

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## INTRODUCTION

Laparoscopic procedures speedily replacing conventional open surgery in many fields of surgery. Inguinal Hernia (IH) is common in pediatric population and most common surgical procedure performed on elective lists<sup>1,2</sup>. Open repair of inguinal hernia with high ligation was practiced for inguinal hernia treatment and considered the gold standard before the beginning of laparoscopic surgery<sup>3-6</sup>. In order to convene

the expedition for limiting pain and better cosmesis, laparoscopic management has been globally adopted which reduces hospital stay, minimal dissection, shorten operative time, early return to normal activity, improved visualization of structure and elevate parents satisfaction<sup>7,8</sup>. In recent years new techniques extended and continue to change. The technique can be divided into intraperitoneal and extraperitoneal repair of inguinal hernia<sup>9</sup>. Different number of trocars was used for laparoscopic repair. The techniques which require more trocar and working instruments will have more visible abdominal scar and increase in operative time<sup>10</sup>. Single trocar technique is nowadays more commonly practiced which lower the invasiveness with best outcome and comparable complication to other techniques. Research has been done globally to know the feasibility and outcome of laparoscopic inguinal hernia repair. We conducted this study to share our experience and to

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know the outcome of single port Laparoscopic Needle Assisted Repair (LNAR) in single center by same team of surgeons.

**MATERIAL AND METHODS**

We conducted a retrospective chart’s review of 105 patients with diagnosis of inguinal hernia (IH) who underwent single port LNAR from May 2015 to July 2017. The study was conducted in Padiatric surgery department of Khyber Teaching Hospital, Peshawar-Pakistan. LNAR performed with single port using spinal needle and a non absorbable suture to encircle the DIR. Patients having aged between 20 days to 16 years and reducible inguinal hernia were included in the study. Patients with obstructed inguinal hernia or operated through laparoscope using other methods were excluded from the study. All surgeries were performed by the same team of surgeons and in the same unit. Patient data was analyzed regarding age, weight, gender, preoperative laterality, operating time, hospital stay, analgesia requirements, postoperative complications and parents/care giver satisfaction. For all patients follow up period was 6 months, having 4 visits with different interval. Patients who lost follow up were inquired through telephone. All patients were discharged on the same day after recovery. CPPV detected were repaired in the same settings. Parents/care giver satisfaction level calculated on 1st follow up visit through a questionnaire [“Appendix”]. All procedures were done under general anesthesia with the patient in supine position and endotracheal tube passed. NG tube passed and urinary catheterization done in all patients on table before starting the procedure. LNAR was performed using a single 3mm supraumbilical port and internal deep ring encircled with a non absorbable suture using spinal needle of 22G. Ring closed with ligating the suture extraperitoneally in the subcutaneous plane.

**RESULTS**

Data of 105 patients was collected and analysed retrospectively, which has 79%(83 out of 105) male and 21% (22 out of 105) female. Preoperatively, 91.43% (96 out of 105) patients had unilateral hernia and 8.57% (9 out of 105) had bilateral hernia. Mean age of patients was 3.7±2.7 SD. Age distribution shows 32.4% (34 out of 105) patients up to 1 year, 49.5% (52 out of 105) patients up to 5 years and 18.1% (19 out of 105) above 5 years. Mean weight of patients was 10.2±5 SD. Weight distribution shows 20.1% patients weighing under 5 kg, 42.8% patients weighing between 5 to 10 kg and 36.2% patients above 10 kg. CPPV was detected in 28.5% (30 out of 105) patients and repair in the same setting to prevent metachronous hernia.

Mean operative time and analgesia requirement for unilateral hernia as well as bilateral inguinal hernia repair. Mean LOHS was 31.79±6.08 hours. Parents/care giver satisfaction is shown in table 1, which shows a high level of satisfaction with the procedure. Postoperative

**Table 1: Operative time, length of hospital stay, analgesia requirements, parents satisfaction score**

<b>Operative time (Mean ± SD)</b>	
Unilateral	10.18min ±2.7
Bilateral	16.38min ±3.28
<b>Analgesia requirements</b>	
Unilateral	5doses±1
Bilateral	7doses±1
<b>Length of hospital stay (LOHS)</b>	31.79 hours±6.08
<b>Parents/Care giver satisfaction score</b>	12.49±1

**Table 2: Postoperative complications**

<b>Complications</b>	<b>Number of Patients and %ages</b>
Recurrence	3/144 (2.08%)
Hydrocele	1/144 (0.5%)
Testicular atrophy	0/144 (0%)
Wound infection	0/144 (0%)

**Annexure: Parents/Care giver satisfaction questionnaire**

<b>Questions to asked on 1st follow up visit</b>	<b>0=Not satisfied</b>	<b>1= satisfied</b>	<b>2=Very satisfied</b>
1.Satisfaction with the recovery time:			
2. Satisfaction with the post-op mobilization:			
3. Satisfaction with post-op feed tolerance:			
4. Satisfaction with wound appearance:			
5. Satisfaction with scar appearance:			
6. Satisfaction with rapid return to normal activity:			
7. If given the choice, would you do the surgery the same way that it was done?	NO	Yes	Sure

complication recorded during the follow period includes recurrence, hydrocele, wound infection and testicular atrophy. Results of postoperative complications are shown in table 2.

### DISCUSSION

Since the introduction of laparoscopy in inguinal hernia repair in early 90s its is gaining attractiveness with many authors reporting its safety and reliability<sup>11</sup>. Initially there was doubt regarding safety and reliability of laparoscopic repair of inguinal hernia in children and now it is considered as a substitute of open repair<sup>1,2</sup>. With growing interest in minimal invasive surgery there has been a conception of new techniques in laparoscopic repair. Expansion of new laparoscopic technique brought further refinement in the ligation of patent processus vaginalis at DIR. These various techniques are extracorporeal and intracorporeal suturing<sup>12,13</sup>. This study was conducted to share single center experience of single port LNAR. Laparoscopic approach to inguinal hernia has the beauty of detection of contralateral PPV and reported incidence is from 23% to 43%<sup>14,15</sup>. Examination has limited role in CPPV detection. Laparoscopic repair for hernia provide an exceptional chance to inspect contralateral PPV and to repair it in same anesthesia<sup>7</sup>. Current study shows CPPV detection in 28.5% cases which were repaired in same anesthesia. Controversy exist in repair of CPPV in same anesthesia as some researcher rejected the idea with the supplication that only a small percentage with develop metachronouse hernia<sup>16</sup>. Operative time is an important parameter to measure the feasibility of the procedure. In the current study operative time for unilateral hernia repair was 10 mins and bilateral hernia repair was 16.38 min. Reported operative time for unilateral LNAR repair range from 17 mins to 20 mins and for bilateral repair 20 min to 26.4 mins<sup>17,18</sup>. The Operative time decrease with experience and vary between different surgeons. Low operative time of LNAR can be attributed to low working port and less instrumentation<sup>19</sup>. Post operative pain after laparoscopic hernia repair is controversial. Some authors have reported similar postoperative pain. Some authors have reported instillation of local anesthetics at port site<sup>20,21</sup>. We recorded postoperative analgesia doses to quantify pain. Unilateral hernia repair requires 5 doses of analgesia while bilateral hernia repair require 7 doses. Less analgesia is attributed to the single 3mm port and low level of intrabdominal pressure. Length of hospital stay has been always less for laparoscopic surgery. Our results showed the length of hospital stay of 31.79 hours for LNAR which is high as reported in literature. High stay is accredited to the initial series of laparoscopic surgery. Satisfaction is an important measure of outcome. In pediatric population

parents satisfaction is very important for any surgery. To know the level of satisfaction, we designed a questionnaire. Reported parents/care giver satisfaction is high in laparoscopic repair of hernia which is endorsed by the current study as well<sup>22,23</sup>. Recurrence of hernia is a major complication. Comparative study with open surgery revealed high, but comparable recurrence rate with laparoscopic surgery. Some authors have reported no recurrence after LNAR<sup>21</sup>. Other have reported recurrence of 1% to 4.4%<sup>16,17</sup>. Our results showed recurrence rate of 2% which is comparable to other studies. The reported incidence of hydrocele after laparoscopic repair of hernia is up to 4%. In our study, 0.5% cases developed hydrocele. Laparoscopic surgery has been popular for low incidence of wound infection. Port site infection is reported up to 1% after inguinal hernia surgery. Wound infection rate in our study was zero, as we use single supraumbilical 3mm port.

### LIMITATION OF STUDY

Small sample size and our early experience of laparoscopic surgery can affect the result of this study. Further research with randomized controlled trial is required to know the impact of laparoscopic hernia repair in children using a spinal needle.

### CONCLUSION

Laparoscopic repair of inguinal hernia in children using a spinal needle is a safe and effective technique with best cosmetic result and high level of parent's satisfaction.

### RECOMMENDATIONS

It is recommended that LNAR using a spinal needle should be considered as substitute to other form of inguinal hernia repair in children.

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#### **AUTHOR'S CONTRIBUTION**

Following authors have made substantial contributions to the manuscript as under:

**Rahman IU:** Main idea and critical Review.  
**Rahman FU:** Data analysis & drafting  
**Imran M:** Data interpretation & literature review  
**Rahman ZU:** Literature review  
**Amin H:** Data Collection  
**Akhtar W:** Article Review & Internet Search  
**Ridhwan W:** Data Collection

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.