

# A case control study of needlescopic herniotomy versus open herniotomy in children

Ranendra Hajong, Kewithinwangbo Newme, Thoiba Moirangthem

Department of General Surgery, NEIGRIHMS, Shillong, Meghalaya, India

## ABSTRACT

**Introduction:** Since the inception of laparoscopy, it has been explored in many fields of surgery, like in the abdomen, hernia, thorax, etc., Laparoscopic hernioplasty in adults is being practiced by many surgeons nowadays. However, the role of laparoscopic inguinal hernia repair in pediatric patients is not well-established, even though it is being explored as an alternative to open herniotomy procedure. In the present study, laparoscopic needlescopic hernia repair was compared with the conventional open herniotomy procedure. **Material and Methods:** The study was a case-control study conducted in a tertiary care hospital in northeast India during 2018–2021. A total of 25 patients underwent needlescopic hernia repair, the outcome of which was compared by collecting data of 25 more patients who earlier underwent open herniotomy repairs. **Results:** The laparoscopic needlescopic repair took a longer operative time as compared to the open technique with a smaller-sized incision. **Conclusion:** Laparoscopic needlescopic hernia repair is a safe and feasible procedure with a similar outcome to open herniotomy but with a smaller scar.

**Keywords:** Herniotomy, inguinal hernia, needlescopic, open, pediatric

## Introduction

In children, congenital inguinal hernia is a common surgical problem requiring an operation.<sup>[1]</sup> Open herniotomy along with high ligation of the hernial sac is the gold standard of treatment for hernia in children.<sup>[2]</sup> Generally, in open herniotomy, high ligation of patent processus vaginalis (PPV) is done at the level of the internal ring and closed. There was doubt on the feasibility of laparoscopic repair of hernia in children a few years back but it is now emerging as a safe and alternate method of hernia repair.<sup>[3]</sup> A comparative study between open and laparoscopic repair was done and it was reported that there was more inclination toward laparoscopic repair.<sup>[4]</sup> The advantages in laparoscopic repair were better cosmesis, minimal dissection of tissues, improved visibility,

and at the same sitting, can allow examination of contralateral PPV and repair if needed.<sup>[2]</sup> It is, however, being debated as expensive with longer operation time and a higher incidence of recurrence.<sup>[5]</sup> The laparoscopic repair can be accomplished in two techniques, that is, intracorporeal and extracorporeal.<sup>[1,6-9]</sup> It is intracorporeal if the suturing and knotting of the internal inguinal ring is done intra-abdominally and extracorporeal if the knot is placed in the subcutaneous tissue.<sup>[10]</sup>

## Material and Methods

The study was conducted during 2018–2021 in a tertiary care hospital in northeast India. A total of 25 patients were operated upon by the needlescopic technique. Data of another 25 patients who were operated earlier by open technique were retrieved and compared with the data obtained from the needlescopic technique. Only one 5 mm port was required for a 30-degree telescope. All hernias were reduced first [Figure 1] showing the hernia orifice from inside. Then, about a 1 cm long skin incision was made in the skin around the deep inguinal ring till the subcutaneous layer

**Address for correspondence:** Dr. Ranendra Hajong, Associate Professor, Department of General Surgery, NEIGRIHMS, Shillong, Meghalaya, India. E-mail: ranenhajong@gmail.com

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under guidance from the camera. A 23 G spinal needle was used to pass a 3-0 polypropylene suture in the form of a loop through the small incision [Figure 2]. Several bites were taken in the peritoneum with the tip of the needle around the deep inguinal ring from the lateral side. The needle was then withdrawn leaving the suture loop inside [Figure 3]. Then, through the same skin incision, the needle was re-introduced with the same 3-0 polypropylene suture from its other end and introduced inside. Several bites were again taken in the peritoneum around the deep inguinal ring on its medial side and the tip of the suture was passed into the previously placed suture loop [Figure 4]. The previously placed loop suture was then pulled externally and tied at the subcutaneous layer in the incision site. The incision was taped with adhesive plaster.

### Results

Of the 50 children, 18 were females and 32 were males. Laparoscopic needlescopic repair was done on 25 children; 16 cases had a right-sided congenital inguinal hernia (CIH) and another 9 cases were left-sided CIH. No contralateral defect was noted in all the cases. Extracorporeal knotting was done in all the cases. The average operating in needlescopic and open hernia technique is significant (*P*-value 0.001).

The mean age was insignificant in both groups. It is noteworthy to say that the operating time in the laparoscopic needlescopic technique is a bit longer as compared to the open technique [Table 1].

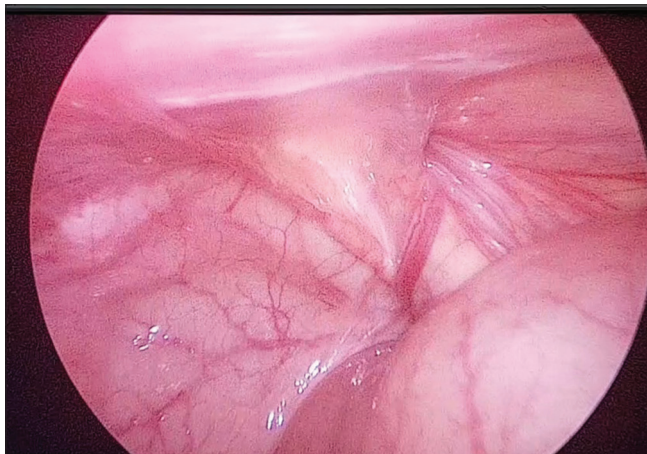
All patients were followed up either physically or telephonically for 3 months. No recurrences were noted in any patients undergoing the needlescopic technique. However, small hematomas occurred in four patients undergoing open technique which were resolved by conservative management. No complications were noted in the needlescopic group.

### Discussion

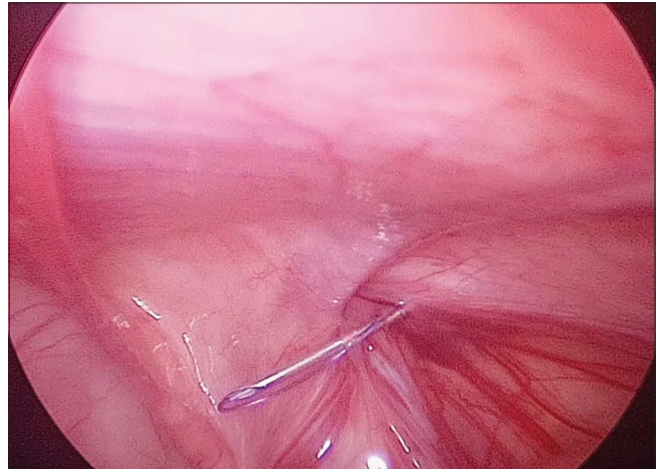
With the advent of laparoscopy, it has been explored in the field of hernia surgery, even in children. Due to its many advantages

**Table 1: Different parameters in the two groups**

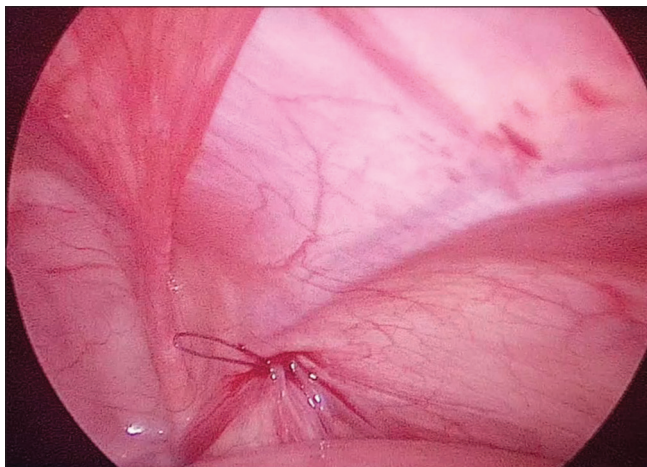
Clinical parameters	Needlescopic	Open	<i>P</i>
Age	6.53±1.401	5.44±1.504	0.709
Duration (minutes)	44.33±7.613	35.50±7.024	0.001
Hospital stay (days)	2.37±0.701	2.31±0.479	0.083



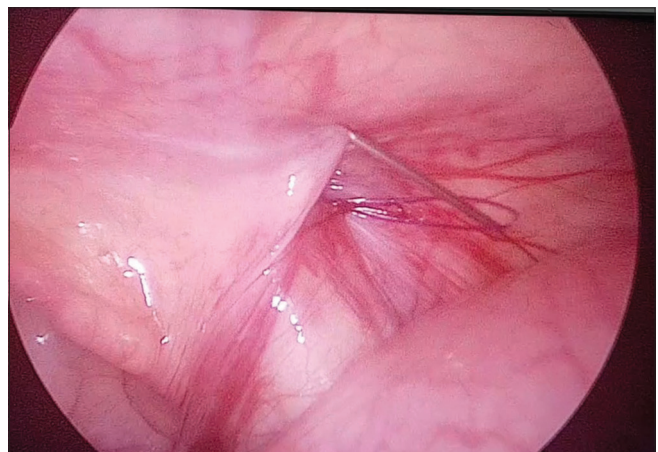
**Figure 1:** Showing hernia.jpg



**Figure 2:** Showing needle passing a suture loop



**Figure 3:** A suture loop



**Figure 4:** Showing a needle is passed inside a loop

over the open procedure, it is gaining popularity slowly. It has advantages over open hernia surgery in that, one can examine the contralateral side<sup>[11]</sup> and also repair any co-existing hernia in the same sitting. The first laparoscopic hernia repair in children was done by El-Gohary in 1997.<sup>[12]</sup> It was performed initially on female patients, but later on, Montepet and Esposito started laparoscopic inguinal hernia repair on male patients too.<sup>[13]</sup>

In the present study, the closure of the hernial sac was done extracorporeally by the puncture needle technique. The operating time was significantly longer in the laparoscopic needlescopic repair open herniotomy ( $P$ -value 0,001). Lee and Liang's study<sup>[11]</sup> also concluded that the laparoscopic hernia repair took a longer operative time than open hernia repair similar to the present study. However, Shalaby *et al.*<sup>[14]</sup> in their study found a shorter operative time in laparoscopic repair than in open hernia repair.

In the laparoscopic approach, it is possible to examine other abdominal organs including all hernial orifices bilaterally which is not possible in the open technique. In the postoperative period, the incidences of the iatrogenic ascent of the testis with relatively longer scars were noted in open repair. In the present study, barring the two cases with scrotal hematomas in the open technique, no complications were noted in the laparoscopic technique. Chinnaswamy *et al.*<sup>[15]</sup> reported hernia recurrences in two children, scrotal swelling in one child, and hydrocele in one child in their series of laparoscopic inguinal hernia repairs in children. The hospital stay was similar in both the groups like the findings of Jie Liu *et al.*<sup>[16]</sup>

## Conclusion

Laparoscopic hernia repair in children is safe and feasible with the added advantage of examination and repair of any contralateral concomitant hernias. It is technically not so challenging. The technique described in the present study is quite easy to master and can be adopted even by surgeons practicing in rural areas.

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## Conflicts of interest

There are no conflicts of interest.

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