



## Surgery

## ROLE OF LAPAROSCOPY IN PEDIATRIC IDIOPATHIC INTUSSUSCEPTIONS

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**ABSTRACT** **Aim:** To evaluate the role of laparoscopy and its effectiveness in treating idiopathic intussusceptions in pediatric patients. **Materials and Methods:** This is a retrospective study of children who underwent laparoscopy for treatment of idiopathic intussusceptions in children < 2 years. Laparoscopic reduction was done under general anesthesia with assisted hydrostatic reduction by saline. The procedure was stopped when complete reduction was achieved and saline distended the terminal ileum. **Results:** Nineteen patients were operated over a period of 2 years. Seventeen patients (89.5%) had ileo-colic intussusceptions and complete reduction was achieved. Two patients (10.5%) had ileo-ileo-colic intussusceptions and only partial reduction was achieved, so open surgery was done. There were no complications. The mean duration of surgery was 40.8 ( $\pm 9.6$ ) min. **Conclusions:** Laparoscopy is safe and effective for treating idiopathic intussusceptions in children. Laparoscopy has specific advantage of confirming diagnosis, reducing it safely under vision, avoiding excessive bowel handling, ensuring completeness of reduction, assessing bowel viability and identifying any complications.

**KEYWORDS :** Intussusception, laparoscopy

**INTRODUCTION:** Intussusception is one of the most common abdominal emergencies in children. Idiopathic intussusceptions occur between 4 months – 2 years of age. The diagnosis is based on clinical features and confirmed by Ultrasound. 80-85% of these cases are reduced by pneumatic or hydrostatic methods under radiological/USG guidance<sup>1</sup> and 10-20% need surgical intervention<sup>2,3</sup>. Traditionally open surgery was done. With the advent and developments in laparoscopy, laparoscopic reduction is now preferred over open surgery<sup>4</sup>. Laparoscopy apart from its general benefits of less pain, less wound complications, better cosmesis, shorter hospital stay etc <sup>5,6</sup> has specific advantage of confirming diagnosis, reducing it safely under vision, avoiding excessive bowel handling, ensuring completeness of reduction, identifying any secondary lead points, assessing bowel viability and identifying any complications<sup>7</sup>. This study was undertaken to review our experience with laparoscopic reduction in idiopathic intussusceptions, with the aim to analyze its efficacy and safety in children.

**MATERIALS AND METHODS:** This is a retrospective study of children who underwent laparoscopic reduction for idiopathic intussusceptions between July 2014 - June 2016 was carried out. The patients who underwent laparoscopy as primary procedure were included in the study. Patients with symptoms and signs of peritonitis, bowel ischemia, advanced bowel obstruction with abdominal distension due to prolonged duration of intussusception were excluded from the study. Patients with failed hydrostatic/pneumatic reduction were excluded from the study.

The data pertaining to age, sex, clinical presentation, duration of symptoms, operative findings, duration of surgery, complications and hospital stay were noted. In these patients under general anesthesia, a 14-16 Fr Foley self-retaining catheter was passed into rectum and the bulb inflated. Warm normal saline bottle kept at a height was connected to the Foleys catheter via IV dripset. A 5-mm subumbilical port for the telescope and a 3-mm bowel grasper in the left flank/suprapubic area were inserted. Intussusception was confirmed and the warm normal saline was infused into the rectum under laparoscopic vision, overdistension of bowel was avoided to prevent inadvertent bowel rupture. The bowel grasper was used to displace the dilated bowel loops for better vision and only minimal handling of bowels was done. The procedure was stopped when complete bowel reduction was achieved and saline distended the terminal ileum. Post reduction the vascularity of reduced bowel, presence of secondary lead points and any complications were assessed before withdrawing the telescope. Oral feeding was started after 12 hrs of surgery and the patients were discharged once full oral feeds were resumed.

**RESULTS:** In the study nineteen patients (sixteen males and three females) with idiopathic intussusceptions were operated over a period of 2 years. The mean age was 7.4 ( $\pm 3.8$ ) months. All the patients

presented with sudden-onset excessive intermittent cry, fifteen patients had history of passing red-currant jelly stools. On examination of abdomen lump was palpable. Ultrasound abdomen confirmed the diagnosis in all. The mean duration from onset of symptoms to surgery was 29.8 ( $\pm 9.4$ ) hrs. In seventeen patients (89.5%) with ileocolic intussusceptions complete reduction was achieved and in two (10.5%) patients with ileo-ileocolic intussusceptions only partial reduction was achieved and laparotomy was done and the ileoileal part was reduced with difficulty. Post reduction there was no bowel ischemia in any patient and no secondary lead points were present. No complications were noted. The mean duration of surgery was 40.8 ( $\pm 9.6$ ) min. All patients had an uneventful recovery, and the mean duration of hospital stay was 3.2 ( $\pm 0.3$ ) days. The mean follow-up was 3 months and no recurrence was noted.

**DISCUSSION:** Intussusception is a very common disease in children. Since the introduction of hydrostatic reduction by Ravitch<sup>8</sup>, nonoperative reduction (pneumatic or hydrostatic) is the preferred first line of therapy with success rate up to 85-90%<sup>1</sup>. Pneumatic or hydrostatic reduction done without anesthesia is associated with patient discomfort and parental anxiety. Any complications like serosal tears and sometimes completeness of reduction cannot be assessed under pneumatic or hydrostatic reduction. Laparoscopic reduction under visual assessment is a very good alternative and it can be easily and safely performed in children.

In this study the mean age was 7.4 ( $\pm 3.8$ ) months and the mean duration from onset of symptoms to surgery was 29.8 ( $\pm 9.4$ ). The mean duration of laparoscopic reduction was 40.8 ( $\pm 9.6$ ) min, which is comparable to that reported by Kia et al<sup>5</sup>. Success rate of Laparoscopic assisted hydrostatic reduction in our study was 89.5%, which is similar to the success rates reported by Kia et al. (87.5%), Cheung et al. (86.7%) and Fraser JD et al (91%)<sup>5,9,10</sup> Kia et al. and Schier F et al recommended that one must exercise greater caution with the laparoscopic approach because of the potential for injury to bowel in view of the fact that traction is used more extensively with the laparoscopic approach while pulling and squeezing the intussusception with bowel graspers<sup>5,11</sup>. In our study, we had no bowel perforation and no need for bowel resection and anastomosis, which may be attributed to the following reasons: (a) early presentation of cases (b) use of hydrostatic technique to assist in reduction (c) reduction under vision and hence overdistension and bowel vascularity could be assessed and inadvertent bowel rupture could be prevented (d) bowel grasper used mainly to displace the dilated bowel loops for better vision of intussusception and not to handle the intussuscepted bowel.

The mean duration of hospital stay in our study was 3.2 ( $\pm 0.3$ ) days which is comparable to that reported by Teitelbaum et al and Cheung et al<sup>12,9</sup>. Laparoscopic assisted hydrostatic reduction has specific

advantage of reducing it safely under vision, avoiding excessive bowel handling, ensuring completeness of reduction, identifying any secondary lead points, assessing bowel viability and identifying any complications<sup>7</sup>.

However certain limitations in children like hemodynamic instability and smaller peritoneal space may compromise the generation of adequate pneumoperitoneum and absence of tactile sensation in laparoscopy may result in missing secondary intraluminal lead points sometimes<sup>1,13</sup>.

**CONCLUSION:** Laparoscopy with assisted hydrostatic reduction is safe and effective in treatment of idiopathic intussusceptions in children. Apart from its general advantages of laparoscopy such as less postoperative pain, reduced wound complications, minimal scarring, better cosmesis, shorter hospital stay, earlier return to normal activities and low long-term risk of bowel adhesions, laparoscopy has additional advantages of confirming the diagnosis in doubtful cases, controlled reduction of intussusceptions under vision, ensures completeness of reduction, assessment of bowel vascularity and identifying any complications.

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