

## Laparoscopic-Assisted Resection of Ileal Lipoma Causing Ileo-ileo-colic Intussusception

Adult intussusception is rare, and the majority of cases has an underlying cause that requires surgical resection. We report a case of a 39 yr-old man with ileo-ileo-colic intussusception caused by ileal lipoma that was successfully managed by a laparoscopic-assisted surgical maneuver. Using a three-cannula technique, ileo-colic intussusception was reduced laparoscopically. Then, through a 4-cm transverse incision in the right lower quadrant abdomen, ileo-ileal intussusception was reduced manually, and a resection of the tumor-bearing ileal segment and end-to-end anastomosis was performed extracorporeally. Although the role of laparoscopy in managing intussusception is not clearly defined, laparoscopy may be an alternative approach to the surgical treatment of adult intussusception in selected cases.

**Key Words:** Intussusception; Laparoscopy; Adult; Colon; Ileum; Lipoma

Kwan Tae Park, Seon Hahn Kim, Tae Jin Song,  
Hong Young Moon

Department of Surgery, Korea University College of  
Medicine, Seoul, Korea

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**Address for correspondence**

Seon Hahn Kim, M.D.  
Department of Surgery, Korea University Ansan  
Hospital, 516 Kojan-dong, Ansan 425-020, Korea  
Tel: +82.31-412-5030, Fax: +82.31-413-4829  
E-mail: drkimsh@chollian.net

### INTRODUCTION

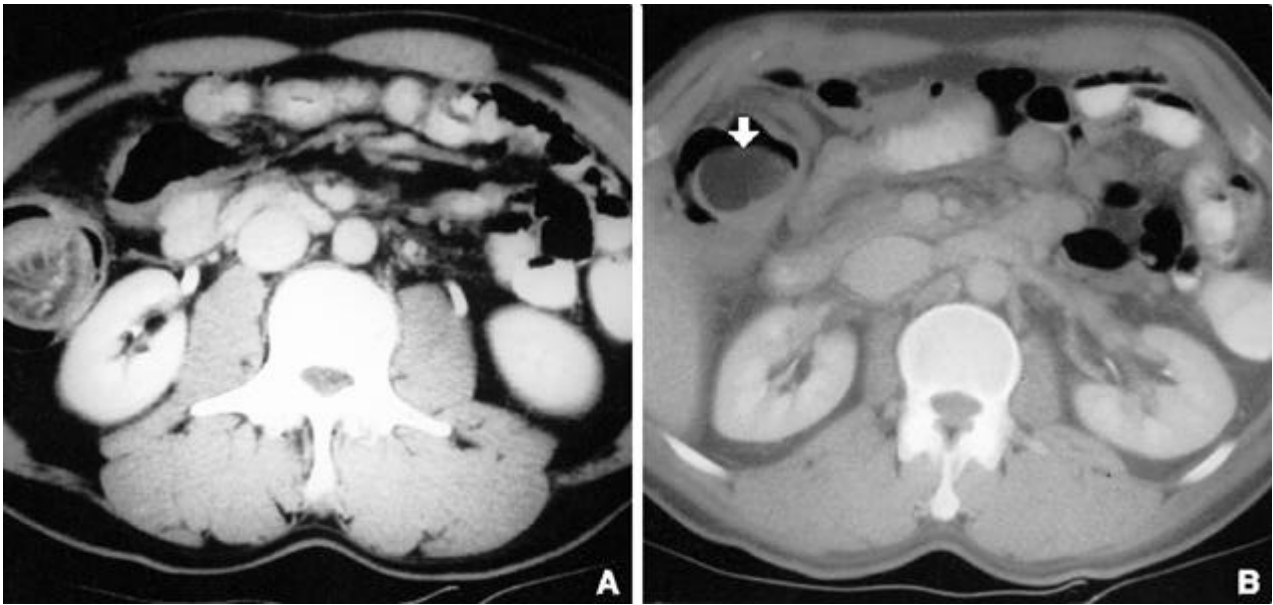
Ileocolic intussusception is rare in adults (1, 2). Contrasting those cases of children, nearly all cases of intussusception in adults have primary causes such as a polyp or a malignant tumor that needs to be resected. Recently, laparoscopic approaches have been used for the surgical management of ileo-colic intussusception in children (3, 4) or jejuno-jejunal intussusception in adults (5, 6). However, to the best of our knowledge, laparoscopic approach for the surgical management of ileo-ileo-colic intussusception in an adult has not been reported. We report here a case of ileo-ileo-colic intussusception caused by ileal lipoma, which was successfully managed by a laparoscopic-assisted surgical maneuver.

### CASE REPORT

A 39-yr-old man was referred to our hospital with a two year history of intermittent abdominal pain, especially, in the right lower quadrant. He denied any symptoms of acute intestinal obstruction. Physical examination revealed a palpable mass in the right lower quadrant and mild tenderness over the mass. His bowel sound was normal. All laboratory values were unremarkable. Barium enema performed at an outside clinic revealed a polypoid filling defect in the ascending colon with coiled-spring

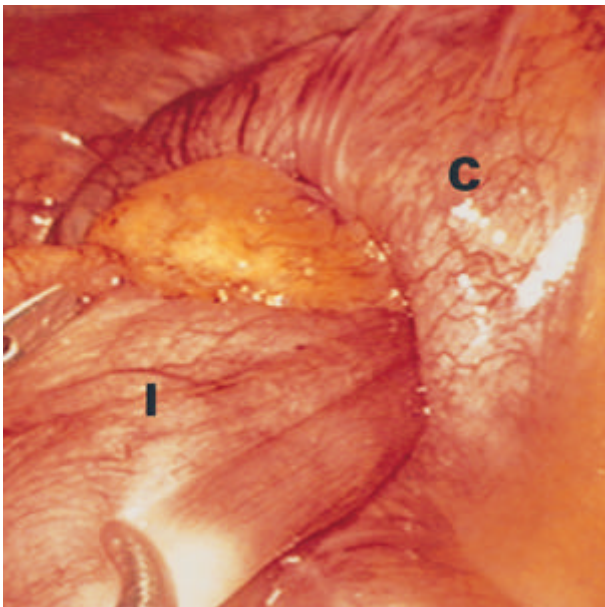
appearance. Abdominal ultrasonography demonstrated a mass with a dense central hyperechoic area surrounded by concentric sonolucent rings. Computed tomographic scan showed a right lower quadrant mass with alternating layers of low and high attenuation (Fig. 1A). This layered pattern was characteristic of intussusception with evidence of an invagination of both the ileum and mesenteric vessels. In the most distal portion of the intussusceptum, a 4×4 cm-sized well-circumscribed mass of fatty attenuation is seen (Fig. 1B). These findings were considered to be consistent with ileo-colic intussusception caused by ileal lipoma.

Laparoscopic surgery was performed under general anesthesia with endotracheal intubation. The patient was placed in supine position. A nasogastric tube and urinary catheter were placed. A 10-mm cannula was inserted just above the umbilicus by an open technique, carbon dioxide pneumoperitoneum of 12 mm-Hg was established, and a zero-degree telescope was inserted. One 5-mm port in the left upper quadrant and one 12-mm port in the left lower quadrant were inserted under direct laparoscopic vision. The patient was tilted to the left side in the Trendelenburg position. There were dense adhesions between the intussuscepted mass and anterolateral abdominal wall, suggestive of chronicity of the lesion. An invagination of the distal ileum into the ascending colon was clearly seen (Fig. 2). Neither the small bowel nor colon was distended. Likewise in conventional manual



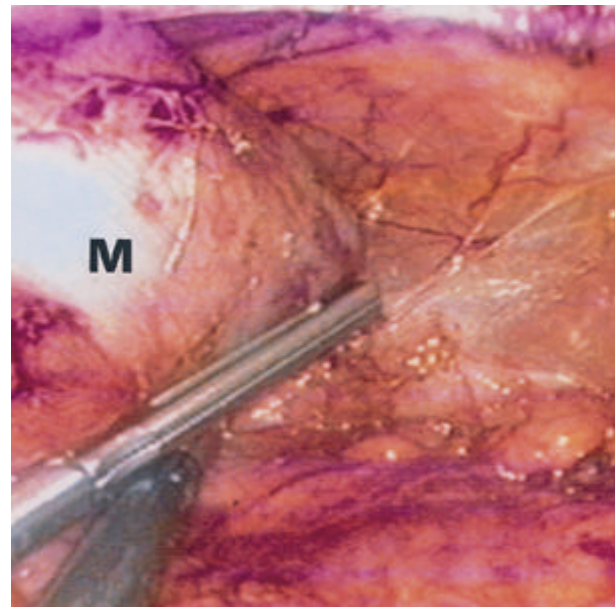
**Fig. 1.** A: Computed tomographic scan shows a right lower quadrant mass with alternating layers of low and high attenuation. B: In the most distal portion of the intussusceptum, a well-circumscribed mass of pure fat density is seen (arrow). It was diagnosed as ileal lipoma and considered as the lead point of the intussusception.

reduction, gentle distal pressure was applied over the intussuscepted mass using two laparoscopic atraumatic forceps. The intussusceptum was slightly squeezed out. Because pericolic adhesions prevented further laparoscopic milking, they were divided by a sharp dissection using dissecting scissors equipped for electrosurgery. Although distal pushing against the intussusception was continued (Fig. 3), complete reduction was not achieved.

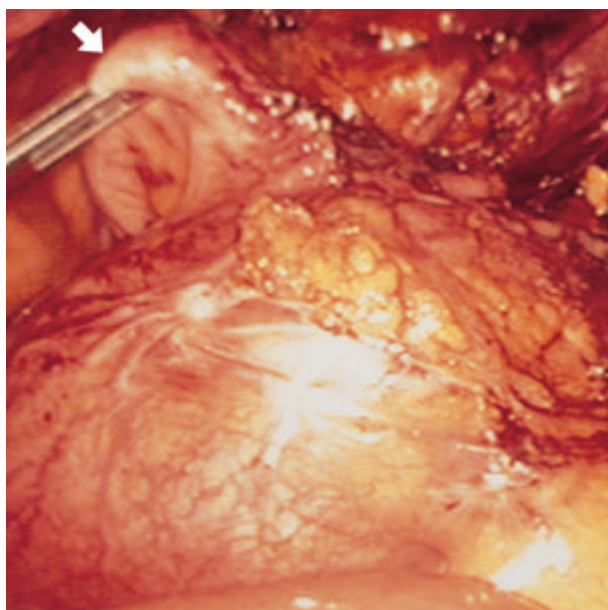


**Fig. 2.** An invagination of the distal ileum (I) into the ascending colon (C) is clearly seen on laparoscopic examination.

While pushing back the intussuseptum, a gentle proximal traction on the ileum was applied. It was partially effective. The wall of both the ileum and colon was thick, so bowel injury did not occur. After distal pushing and proximal pulling were applied over a period of time, the entire appendix was visualized (Fig. 4). The terminal ileum was felt as a fixed mass on laparoscopic palpation. We thought that the reduction was completed.



**Fig. 3.** Gentle distal pressure is applied against the distal end of the intussuscepted mass (M) using two laparoscopic atraumatic forceps.



**Fig. 4.** Laparoscopic reduction of the ileocolic intussusception is completed when the entire appendix (arrow) is visualized.

A planned 4-cm transverse incision was made in the right lower quadrant abdomen for an extracorporeal resection of the ileal tumor. When we attempted to deliver the distal ileum into the wound, another ileo-ileal intussusception was identified unexpectedly. It was reduced manually without difficulty by the surgeon using the fingers. Complete reduction was ensured as serosal invasion of the yellowish tumor was seen in the ileum. After delivering the tumor-bearing segment through the wound, extracorporeal resection and anastomosis were performed in a usual fashion. Operating blood loss was 50 mL and operating time was 162 min.

The patient was started on free oral fluid on the first postoperative day and was discharged on the fourth postoperative day. There were no postoperative complications. The histologic diagnosis of the tumor was lipoma measuring 4 cm in diameter.

## DISCUSSION

In theory, there are two questions concerning the role of laparoscopy in managing intussusception. First, is it technically feasible to reduce an intussusception laparoscopically? Second, can a lead point, if one exists, be managed appropriately using laparoscopic techniques? In infants with ileocolic intussusception, if hydrostatic enema or pneumatic reduction failed, surgical reduction is indicated. Recently, in these cases, laparoscopic reduction was tried instead of open surgery (3, 4). Schier (3) reported that four of seven intussusceptions with failed

hydrostatic reduction were successfully reduced by laparoscopy. Reduction was quite easily completed after only minor squeezing and pulling with laparoscopic forceps. Cuckow et al. (4) also described two laparoscopic reduction techniques for infantile ileocolic intussusception. Initially, they pulled gently the antimesenteric wall of the ileum proximal to the intussusception while applying countertraction to the right colon, with using two pairs of atraumatic forceps. This proved unsuccessful. The second technique involved grasping the ileum and stroking the neck of the intussusception back over the invaginated bowel. Reduction was achieved with persistent effort over several minutes. An experimental study (7) was designed to evaluate the feasibility of laparoscopy in assisting pneumatic reduction for the dogs with artificially-produced ileocolic intussusception. The success rate was 96% (26 of the 27 dogs) and bowel perforation was observed in one dog. These clinical and experimental results may justify the further exploration of the role of laparoscopic techniques in the treatment of infantile ileocolic intussusception. The fact that spontaneous reduction occurs after general anesthesia in some cases, thus avoiding unnecessary open surgery also support the potential role of laparoscopy.

The role of laparoscopy in adult intussusception seems more obscure than in infants because very few laparoscopically managed cases have been reported (5, 6, 8). However, the presence of thickened wall in the affected bowel loops without acute intestinal dilatation in most adult intussusceptions may make laparoscopic approaches easier than in infants. Based on the literature (5, 6, 8) and our experience, this statement is not just in theory but in reality. In all three reported cases (5, 6, 8) of adult small bowel intussusception managed laparoscopically, reduction was easily accomplished. In our case in which dense pericolic adhesions was present at the time of surgery, the ileo-colic intussusception was successfully reduced without much difficulty by the combined action of distal milking and proximal pulling.

The ileal tumor preoperatively diagnosed as lipoma was resected extracorporeally in this case. Extracorporeal removal of a large hamartoma in Peutz-Jeghers syndrome (6) and a low-grade lymphoma (5) were also reported in laparoscopically managed cases. Almost half of colonic intussusceptions are associated with malignancy (2). If the leading point is a malignant tumor, delivery of the affected bowel through the wound may be arguable in terms of tumor deposits in the wound. We believe that, if malignancy is highly indicated in the leading point, conventional surgical resection of the intussusception without reduction is the preferred treatment (9). However, in our case, we chose laparoscopic reduction as the treatment option because the ileal tumor showed a typi-

cal benign nature on preoperative CT scan.

In conclusion, laparoscopy may be a safe and feasible alternative for the surgical management of adult ileo-colic intussusception caused by a benign-appearing tumor that does not cause acute intestinal obstruction.

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