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# Laparoscopic ileo-cecectomy for ileo-ceco-colic double intussusception due to a cecal adenoma harboring multifocal high grade dysplasia in a 24 years old male: A case report

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## ABSTRACT

**INTRODUCTION:** Intestinal Intussusception is defined as invagination of the intussusceptum into the intussusceptum, and is responsible of 1% of all bowel obstructions. It is rare in adults and common in children. It is mostly due to organic causes in adults that form lead points. Enterointeric intussusception is the most common type. Signs and symptoms are more classic in children but nonspecific in adults. Usually diagnosis is made intraoperatively, while abdomino-pelvic CT scan is the best preoperative imaging modality. Intestinal Intussusception in adults, especially when the colon is involved, is best treated by surgical resection.

**CASE PRESENTATION:** A 24 years old previously healthy male with no surgical or documented familial history presenting for severe crampy abdominal pain and distention, obstipation and palpable right lower quadrant abdominal mass. Abdominal Multi-slice CT diagnosed an ileo-colic intussusception without signs of bowel suffering. Laparoscopic ileo-cecectomy. Final Pathology showed a 4 cm cecal tubular adenomatous polyp with multifocal high grade dysplasia.

**CONCLUSION:** Intestinal intussusception in adults is an interesting rare entity that have the interest of general surgeons. Malignant lesions can be lead-points and they form a great counterpart among other colonic lesions. Minimally invasive laparoscopic surgery is gaining interest in management, and surgical resection remains the gold standard while reduction before surgery is debatable and can be considered in selected cases.

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## 1. Introduction

Intestinal Intussusception (II) is an uncommon old entity defined by invagination of the proximal bowel edge (traditionally named intussusceptum) into the distal bowel edge (intussusceptum) [1]. It is rare in adults, accounting to 1% of bowel obstruction cases and 5% of whole intussusceptions as reported by major centers worldwide and 3:1 male to female ratio [2,3]. BI can be classified into 4 types: 1) entero-enteric in small bowel (43%), 2) colocolic (22%), 3) ileocecal with the ileocecal valve acting as a lead point (21%) and 4) ileocolic (14%) [3]. Adults are usually lesser symptomatic than children, mostly presenting as abdominal pain

and distention, nausea and vomiting, and rarely with palpable mass, fever and diarrhea [4]. Most cases are idiopathic in children, while it is nearly 90% due to organic causes in adults. II in colon is 60% due to malignant bowel lesions, thus treatment is definitely an oncologic resection [4]. Abdomino-pelvic Computed Tomography (CT) scan is the gold standard for diagnosis with an accuracy approaching 100% [5]. Double intussusception represents an interesting uncommon phenomenon within the English literature; herein, we report a case of a 24 years male patient diagnosed with ileo-ceco-colic intussusception treated by laparoscopic oncologic surgical resection. This case was reported in line with Scare 2018 criteria [6].

## 2. Case presentation

This is a case of 24 years old previously healthy male patient with negative family and surgical history presented to the Emergency Room for severe colicky abdominal pain that was associated with nausea, vomiting, constipation and obstipation. He stated on/off Melena and/or fresh blood with several bowel movements as well

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**Fig. 1.** A ileocecal intussusception (blue arrow) seen on transverse cut of a CT scan abdomen-pelvis with IV contrast. B ileocecal intussusception involving the transverse colon (arrow) on transverse cut of the CT scan Abdomen-pelvis with IV contrast.

as several episodes of watery diarrhea and self-limited abdominal distention since 1 month. He denied any febrile episode. Upon physical exam, patient has a moderately distended, diffusely tender and soft abdomen. A tender mass was palpable on the right lower quadrant. Vital signs were stable, labs were within normal limits. He was admitted to regular floor for investigations and medical therapy and a surgical consult was obtained. A CT scan of abdomen and pelvis (Fig. 1A and B) with IV contrast was done showing mildly distended small bowel loops, ileocolic intussusception reaching the proximal part of the transverse colon, no bowel suffering and normal other visceral organs.

Urgent Exploratory laparoscopy was done by the primary surgeon and an ileo-ceco-colic intussusception was encountered (Fig. 2A–D) with an edematous right colon mesentery. It was successfully reduced (showing no signs of ischemia, necrosis or perforation) prior to the resection and anastomosis. The ileocecal vessels were ligated.

Ileocectomy was performed with intracorporeal ileo-cecal side-to-side anastomosis by Endo GIA 60 mm blue (Fig. 2E). The resected segment (5 cm of ileum and 10 cm of right colon) was sent to pathology (Fig. 3).

The Patient had an uneventful postoperative period, spent 4 postoperative days, and discharged on soft diet. Follow up in the out clinics showed normally healing surgical wounds, normal laboratory tests, and absence of the previously suffered abdominal

pain. Final Pathology of the taken segment showed a 4 cm tubular adenoma at the cecal base with multifocal high grade dysplasia and associated with acute serositis and pericolic fat necrosis, 22 pericolic lymph nodes were noted to be negative for malignancy.

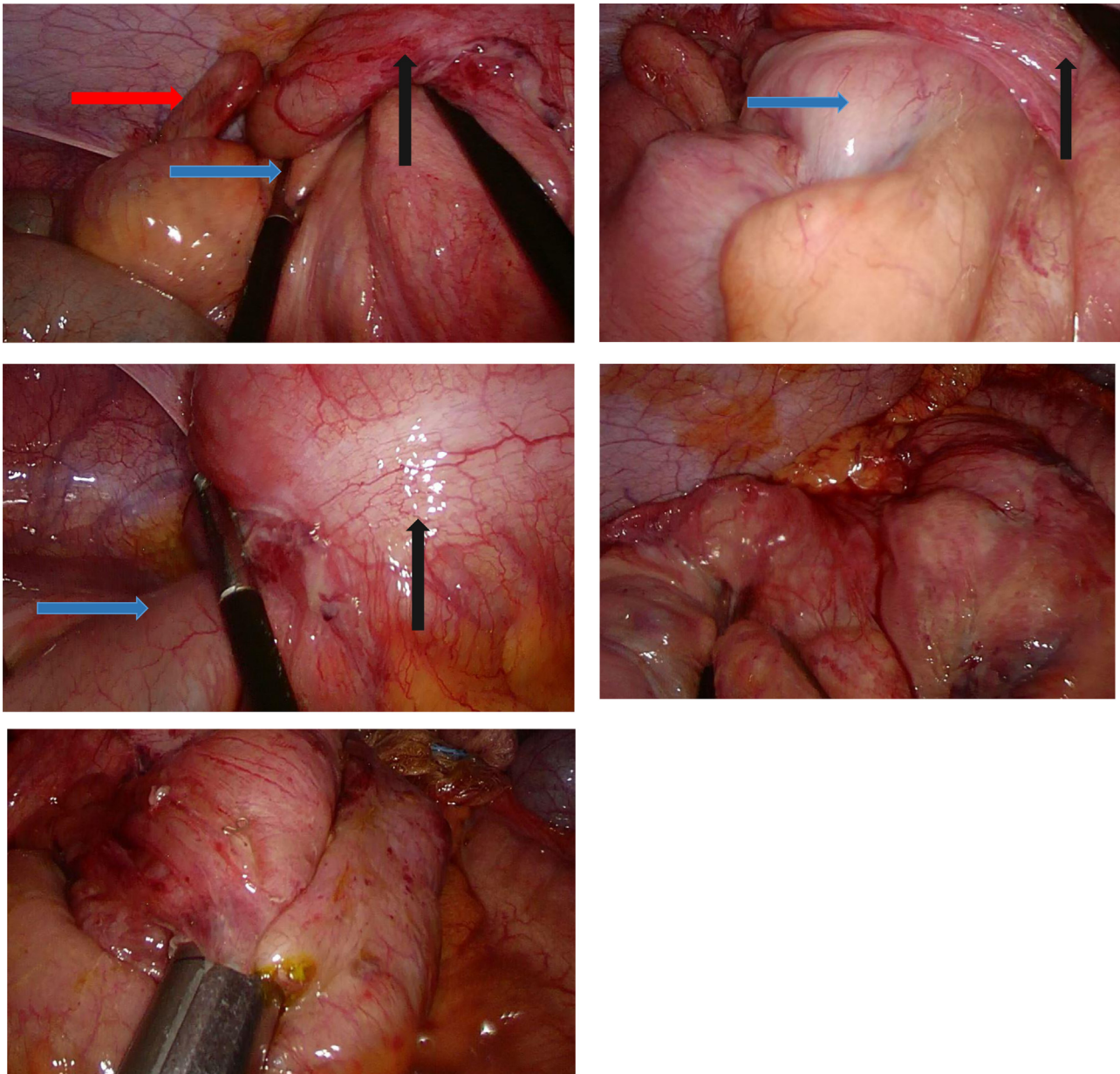
### 3. Discussion

II is first discovered by the Dutch doctor Paul Barbet in Amsterdam in 1674, and first treated with manual reduction by the English surgeon Sir Jonathan Hutchinson in 1871 [1]. Adults II is mostly due to organic lesions that may be considered as a risk factor or a cause for such event. The mechanism of II is considered to be an erroneous peristalsis near to the lesion which will serve as a lead-point. About 30% of Adult BI involve the colon, where lesions are mostly malignant (Adeno Carcinoma, lymphoma...) and uncommonly benign (mainly adenomatous polyps). Ileo-cecal intussusception was seen due to benign lesions such as appendix, Meckel's diverticulum, inflammatory lesions, polyps, lipomas, previous anastomosis site, endometriosis, worms and foreign bodies. Malignant lesions are ileal or cecal carcinoma, carcinoid tumors and lymphomas [7]. Symptomatology of Adults patients is different from that of children, where the classical triad of abdominal pain, palpable mass and jelly stools is rarely encountered in adults [8]. Symptoms are mostly chronic (48%) (7 days to 3 months) and non-specific, maybe acute in 34% of cases ranging from hours to 7 days or long lasting from 3 months to one year (22%). This represents a challenge to the physicians yet it is preoperatively diagnosed in 30% of cases [3,9].

Work up for Adult II can be accomplished through several imaging modalities in case of recurrent symptoms and increased severity. Aggressive work-up is not indicated in case of mild and transient symptoms or enteric II in young cases [7]. An abdominal X-ray have little significance and may only show intrapped air crescent sign between the intussuscepted intestines. Barium studies are useless in adults. Ultrasound is more used in children showing the classic doughnut sign (target sign), while it is not that reliable in adults [10]. Multislice Abdominal-pelvic CT scan with contrast material is the most significant imaging modality in adults' II diagnosis [7]. Several stages can be clarified on CT scan; early stage II showing a target sign on transverse cuts, this progresses to sausage-shaped structure that is best seen on longitudinal cuts, then finally to pseudokidney mass that develop later due to chronicity, mesenteric and bowel wall edema, and vascular impendence and compromise. This stage may lead to necrosis and bowel wall perforation. MRI showed equal importance in diagnosing the adult BI and its etiologies [10].

Cecal adenoma is one of the most common benign lesions that may cause ileo-cecal II. In patients younger than 50 years old, studies showed that prevalence of a polyp in the first colonoscopy is 6%, where only 3 and 5% might be harboring invasive carcinoma or high grade dysplasia (termed carcinoma in situ limited to muscularis mucosa) respectively [11,12]. Advanced adenomas (AA) are defined as polyps being >1 cm in size or containing villous tissue or high grade dysplasia; these are ones of the risk factors of Colorectal cancer, thus searching for a familial inherited syndrome is required in cases of young adults [12].

The site of the Adults' II influences the surgical procedure and the treatment plan. It is clear that small bowel intussusception can be reduced prior to surgical resection for the lead points have a lesser malignancy rate than colonic leadpoints. When it comes to the colon BI, things get debatable. Opponents have stated that colonic II leadpoints are usually malignant and chronic, thus manipulation may lead to seeding of tumoral cells and venous embolization, perforation and fecal material spillage, and higher risks of anastomotic complications [4]. Supporters recommended that reduction fol-

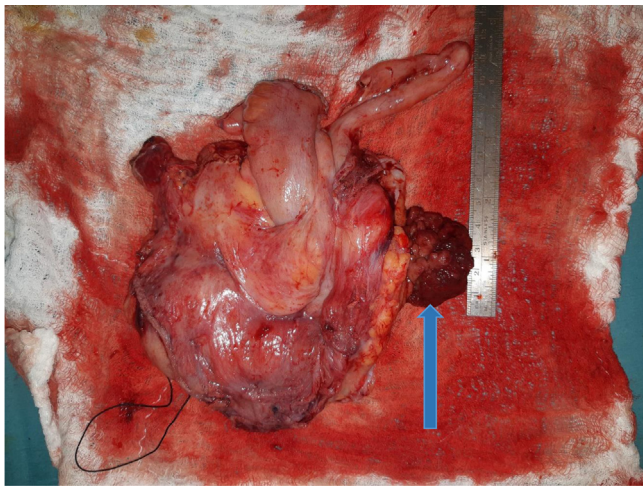


**Fig. 2.** A. ileo-cecal intussusception seen during laparoscopic exploration (appendix: red arrow, terminal ileum: blue arrow, colon: black arrow). B: image showing edematous cecal wall and mesentery during laparoscopic reduction of the fore mentioned intussusception. (Cecum: black arrow, ileum: blue arrow). C: Colo-Colic Intussusception seen on laparoscopy (black arrow: ascending colon, Blue arrow: cecum). D: Laparoscopic view of the right colon post-reduction of ileo-ceco-colic intussusception. E: Mechanical ileo-colic intracorporeal side-side anastomosis after laparoscopic ileo-cecectomy using endoGIA blue 60 mm.

lowed by surgery may decrease the size of resected bowel especially in case of enteroenteric II or if necrosis or vascular compromise are not present or suspected [4]. This suggest that reduction of II may be attempted regardless of the type of the intussusception unless there is a preoperative diagnosis of bowel ischemia or malignancy [13]. Surgical oncologic resection is the treatment of choice meanwhile. Minimally Invasive laparoscopic techniques are gaining importance in dealing with BI at different sites. The extent of oncologic colon resection should be 5–7 cm proximal and distal to the leadpoint along with the feeding vessel and the draining lymph nodes. The recommended minimal number of lymph nodes excision is 12 and are enough to tell it is an N0 stage when they are all negative [14]. Nonoperative colonoscopic reduction of ileo colic and colo-colic adults' II has been reported to be effective in selected cases where there is no signs of bowel suffering, this may act as a bridge to surgery [13]. Combined endoscopic-laparoscopic surgery

is a new technique that have been invented for polyps that are hard to resect by conventional colonoscopy due to location or size especially those involving the right colon. It is currently applicable in polyp size <5 cm, age >18 years old, benign polyps with/without high grade dysplasia, no multiple polyps or familial polyposis syndromes, and no simultaneous or history of left colon cancer [15]. A colonoscopy follow up is indicated for advanced and malignant polyps in 1 year colonoscopy if surgical excision was performed, then in 3–5 years if no adenomas are detected [16].

The previously healthy 24 years old male patient with no documented family history of colon cancer was diagnosed with a cecal AA 4 cm in size harboring multifocal high grade dysplasia after a laparoscopic ileo-cecal oncologic resection with ileo-colic intra-corporeal anastomosis. He was suffering of severe occlusive symptoms along with the triad of abdominal pain, currant jelly stools and palpable right lower quadrant abdominal mass is



**Fig. 3.** The resected specimen showing a cecal mass measuring 4 cm sent to pathology. (Arrow).

rarely encountered in adults. Abdomino-pelvic CT scan with contrast was the diagnostic procedure that detected the target sign on transverse cut with no signs of intestinal suffering. Laparoscopic ileo-cecal resection is rarely reported in literature, and this is the only reported case of cecal adenomatous polyp showing multifocal high grade dysplasia and causing ileo-ceco-colic double intussusception that was resected respecting the oncological rules. Patient is then followed by his gastroenterologist, and his follow-up colonoscopy is planned after 1 year.

#### 4. Conclusion

Adults' II is an ancient and uncommon interesting phenomenon that present usually with chronic nonspecific abdominal symptoms. Colonic involvement is majorly due to malignant lesions. Despite the advance of several diagnostic methods, an uncountable number of cases are still intraoperatively diagnosed. Abdomino-pelvic CT scan is the diagnostic gold standard. Manual reduction prior to surgery is still debatable, and can be safely done in some cases. Oncological surgical resection is the most agreeable definitive treatment method. Colonoscopic follow up is crucial and duration varies according to the findings. Searching for familial inherited syndromes that increase the risk of colorectal cancer must be carried in young adults with a history of excised AA polyps.

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This article has no conflict of interest with any parties.

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#### Ethical approval

The study type is exempt from ethical approval.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images.

A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contribution

Writing the paper: Elias El-Khoury, Jad J Terro, Etienne El-Helou.  
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