

## CASE REPORT

## Ileoileal intussusceptions in a 13 year boy due to giant Meckel's diverticulum: a case report

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### Abstract:

Meckel's diverticula are common congenital gastrointestinal malformations. Most Meckel's diverticula are clinically silent. It has been called the "great imitator" because of its relative infrequency and protean manifestations. These diverticula may become inverted and serve as a lead point for development of intussusceptions.

Here in we report a case of 13yr old boy presented with features of gastroenteritis, non-bilious vomiting, non-bloody stool, initially without pain abdomen, and found to be having intussusception, on investigation. On performing laparotomy the intussusceptions was found to be having an inverted giant Meckel's diverticulum as a lead point.

Small bowel intussusception is different clinically from the classic ileocolic intussusception. Not only is it seen in a different age group,<sup>1</sup> but the presentation is different and there is more chance of finding a pathological lead point.<sup>2</sup> The unusual age group and variable presentation contribute to the frequent delay in diagnosis with increased morbidity and mortality.

**Keywords:** Giant Meckel's diverticulum, ileo ileal intussusception, (PLP)pathological lead point.

### Introduction:

Intussusception is the most common cause of intestinal obstruction between 6 and 36 months of age. 80% of those affected are in the first 2 years of life.<sup>3</sup> It is characterized by the telescoping of one segment of bowel (intussusceptum) into its neighboring segment (intussusciptens), situated most commonly near the ileocecal valve (ileocolic). In 75% of cases, the invagination is idiopathic. In children less than age 3 months or older than 5 years, however, it more commonly originates from a pathologic lead point (e.g., Meckel diverticulum, polyp, hemangioma) or can be associated with conditions causing hypertrophy of Peyer patches (e.g., Henoch-Schönlein purpura, lymphoma, rotavirus infection). The characteristic symptoms include episodes of unremitting, colicky abdominal pain with drawing up of the knees, vomiting, and, in the later stages, currant jelly stools. The signs

may include a tender abdomen with a sausage-shaped mass in the mid-abdomen.

The classical triad consists of pain, abdominal mass, and currant jelly stools. Prompt diagnosis and treatment are important, given the risk for bowel necrosis, peritonitis, and sepsis. Abdominal ultrasonography is the gold standard for investigating intussusception, with the "target sign" (i.e., bowel within bowel) being pathognomonic. Pneumatic or hydrostatic (barium or saline) enema under fluoroscopic or sonographic guidance can also be diagnostic and is the standard of care for the non-surgical reduction of classical ileocolic intussusception. Importantly, persistent intussusceptions involving only the small bowel are not amenable to radiologic reduction, in which case surgical reduction is necessary.

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Figure 1: Ultrasound showing target sign

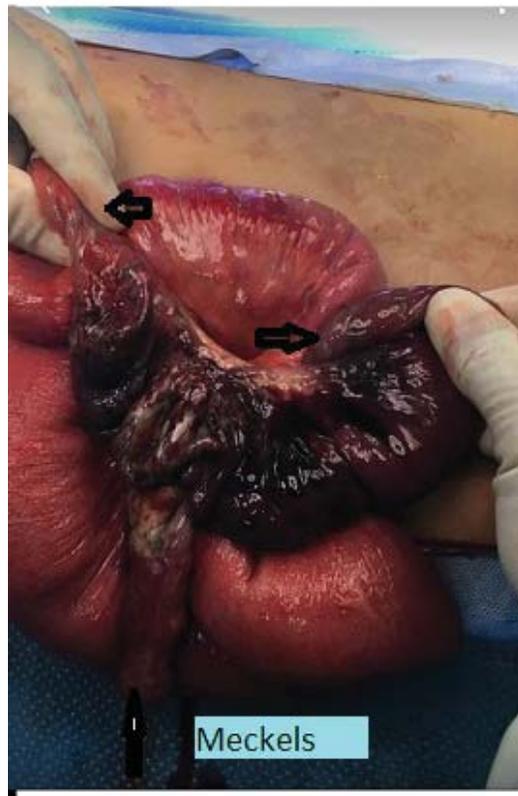


Figure 2: Surgical gross specimen of bowel demonstrating length of ileoileal intussusception (black arrows) and extensive hemorrhagic infarction of the involved ileum (white arrows)

#### Case Report:

A 13-year-old boy presented to the emergency department (ED) with non-bilious vomiting 8 to 10 times, loose motions 3 times, watery in nature, no blood in stool. On examination, he was dehydrated, with a blood pressure of 110/70 mmHg, pulse rate of 72 beat/min, temperature of 36.8°C. The abdomen was soft, not distended, non-tender no organomegaly. Immediate resuscitation in the ED was started with intravenous infusion of crystalloid fluids through large bore

intravenous cannulae. Lab results Hb 13.9, wbc 11.7, sodium 137, potassium 4.4. Creatinine 59. He was admitted in to pediatric ward with a diagnosis of gastroenteritis.

As he has developed a persistent abdominal pain pediatric surgical consultation was obtained.

Plain abdominal X-ray revealed dilated small bowel loops. An emergency ultrasound of the abdomen was performed which has revealed a target sign. Signs of small bowel intussusceptions.

He underwent exploratory laparotomy with a provisional diagnosis of small bowel obstruction due to intussusception. Abdominal exploration revealed massively dilated small bowel proximal to ileoileal intussusception. Intra operative findings Ileo-ileal intussusception about 20cm away from the ileocecal junction. On palpation the segment had hard consistency. After manual reduction of the intussusception, segmental ileal resection with an end to end anastomosis was performed. Exploration of the resected segment showed the leading point of intussusception was an inverted Meckel's diverticulum. The histopathology showed a gangrenous ileal segment with Meckel's diverticulum. The patient was discharged from the hospital on 7th day post-operatively with an uneventful post-operative course.

#### Discussion:

Charles Mayo famously wrote that "Meckel's diverticulum is frequently suspected, often looked for, and seldom found."<sup>4</sup>

Meckel's diverticulum is a true diverticulum and the most common gastrointestinal malformation, occurring in 2% of the population.<sup>5</sup> Meckel's diverticulum is due to the persistence of the vitelline duct and, in its most common form, presents as a two inch blind segment of bowel approximately two feet from the ileocecal valve and often containing ectopic gastric or pancreatic tissue.<sup>6</sup>

Up to half of symptomatic Meckel diverticula



Figure 3: Resection of infarcted bowel, and end to end anastomosis done.

will present in the first 2 years of life, and most complications will develop before 10 years of age. The type of complication also varies with the age of the patient. Hemorrhage and obstruction predominate in the very young, and obstruction and inflammatory symptoms occur in adults. Neoplasia becomes a more frequent complication in the elderly.

Overall, neoplasia is found in 0.5% to 4% of Meckel diverticula<sup>7,8</sup> and malignant tumors predominate. Benign tumors include leiomyomas, lipomas, angiomas, and neurofibromas. A variety of malignancies have been reported (leiomyosarcoma, carcinoids, adeno-carcinoma, villous adenoma, gastrointestinal stromal tumors, and others). Overall, carcinoid is the most common tumor arising in the diverticulum.

MD range in size from 1-10 cm, cases of giant MD ( $\geq 5$  cm) are relatively rare and associated with more severe forms of the complications, especially for obstruction. Herein, we report a case of giant MD with secondary small bowel obstruction in a 13-year male that was successfully managed by surgical resection and anastomosis. The largest giant MDs reported have been > 100 cm long,<sup>9</sup> 96 cm long,<sup>10</sup> 85 cm long,<sup>11</sup> and 66 cm long.<sup>12</sup> Some authors consider vitelline cysts as Giant Meckels diverticula.

Common complications of Meckel's diverticulum include rectal bleeding, melena and/or hematochezia, although many patients are entirely asymptomatic. Less frequent complications include Meckel's diverticulitis, intestinal obstruction, volvulus, and intussusception, and the lifetime complication rate for untreated Meckel's

diverticulum 4%.<sup>13</sup> Meckel diverticula can cause a bowel obstruction via intussusception, volvulus, vitelline bands/remnants, incarcerated Littre hernia, and other mechanisms. Intussusception is slightly more common in children, and volvulus in adults. Intussusception is a result of the diverticulum acting as a pathologic lead point. Pathologic lead points are infrequent in children with intussusception younger than the age of 2 years. Although intussusception can be seen in all pediatric ages from prenatal to the late teens, 75% of cases occur within the first 2 years of life and 90% in children within 3 years of age. More than 40% are seen between 3 and 9 months of age<sup>14</sup>.

#### Pathologic Lead Point:

The most common focal cause of a PLP is an inverted Meckel diverticulum<sup>15-17</sup> followed by intestinal polyps<sup>18</sup> and duplications. Other less common focal PLPs that have been reported are; inversion appendectomy,<sup>19</sup> appendiceal mucocele; local suture line; massive local lymphoid hyperplasia; ectopic pancreas; abdominal trauma; benign tumors (adenoma, leiomyoma, carcinoid, neurofibroma, hemangioma); and malignant tumors (lymphoma, sarcoma, leukemia).<sup>20,21</sup>

#### Diagnosis:

The optimal strategy for diagnosis and treatment depends on the clinical suspicion of intussusception, and the experience of the clinician in the hands of an experienced examiner, ultrasound can have 100% accuracy for the diagnosis of intussusception.<sup>22-24</sup> The major advantage of ultrasound for detection of intussusception is that it is portable, non-invasive, and without radiation. With the use of modern high-resolution transducers, the diagnosis of intussusception is straight forward. The characteristic finding is a 3 to 5cm diameter mass, the typical target or doughnut sign, which is usually found just deep to the anterior abdominal wall on the right side.

Patients with intussusception limited to the small bowel (ileo ileal, jejuno ileal, jejuno jejunal) are managed differently, as compared to ileocolic intussusception, small bowel intussuscep-

tion are less likely to respond to non operative reduction. Surgery is necessary to reduce the small bowel intussusception or to excise the lead point.

### Conclusion:

The classic symptoms of abdominal pain or vomiting and the two classic signs of abdominal mass or rectal bleeding are present in 85% of patients. A high index of suspicion must be maintained for atypical cases, such as the 15% whose intussusception is painless. In conclusion, small-bowel intussusception is rare, accounting for fewer than 10% of all cases of childhood intussusception. It is seen more commonly in neonates and those over two years of age. It should be suspected in children with features of intestinal obstruction. Ultrasonography is the diagnostic procedure, and so should be the investigation of choice, since barium enema is likely to be negative. Surgery in these patients should not be delayed because of the high incidence of finding a lead point and also the need to obviate ischemic necrosis of the small bowel. PLPs can be found in 4% of infants and children who have one recurrent intussusception, and in up to 19% with multiple recurrences.

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### Role and contribution of authors:

Dr Abdulrahman Almaawi, is a consultant Paediatric surgeon at King Abdullah Hospital, Bisha, operated upon this patient and conceive the idea of writing this case report, went through the article and made the final changes in the case report and discussion and conclusion.

Dr Ramakrishnaprasad D. collected the data and references and wrote the initial write up.

Dr Hossam Youssry helped in collecting the data and references and also helped in discussion and conclusion writing.

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