Intussusception is one of the common causes of acute abdomen in pediatric age bracket with ileocolic type being the most prevalent. This happens when a proximal segment of bowel (intussusceptum) telescopes into the lumen of the adjacent distal segment (intussuscepiens). Its incidence is highest between 5 to 9 months aged, being uncommon in neonates. Overall, the male-to-female ratio is approximately 3:1. With advancing age, gender differences become marked; in patients older than 4 years, the male-to-female ratio is 8:1. The studies of prevalence of the disease ask commonest variant i.e., ileocecal intussusception. The etiology is idiopathic in pediatric age bracket however hyperplasia of the intestinal Peyer’s patches secondary to viruses like adenovirus, enterovirus, echovirus and human herpes 6, 7 are identified as the leading point in neonates whereas Meckel’s diverticulum, duplications, polyposis and lymphomas act as pathological lead point in children older than 2 years. Adult intussusception is rare, representing only 1-5% of all bowel obstructions with colocolic being the foremost prevalent type and therefore the commonest causative factors are chronic inflammatory bowel disease, benign or malignant intraluminal lesions, metastases, foreign bodies, Meckel’s diverticulum etc., or by postoperative adhesions. Few reports had also shown, Juvenile Intussusception – A common entity but seldom diagnosed (lesson learnt from case series for family physicians).

**Case Series**

Intussusception is one of the common causes of acute abdomen in pediatric age bracket with ileocolic type being the most prevalent. This happens when a proximal segment of bowel (intussusceptum) telescopes into the lumen of the adjacent distal segment (intussuscepiens). Here we report six cases of intussusception in which five were in pediatric age group and one was adult. All children were admitted, resuscitated well, USG abdomen was done to confirm the diagnosis, written and informed consent for surgery and anaesthesia, was taken from parents. However, all were managed successfully by hydrostatic saline reduction under sedation. Only one child had recurrence after one year who was again treated conservatively. Adult case was managed by means of laparotomy by excision of benign polyp being the pathological lead point. We present this case series to analyse the spectrum of presentation, diagnostic and therapeutic options available with review of literature. Since primary care providers and family physicians are first responders, this case series would help them for differential diagnosis and prompt referrals for further management.

**Keywords:** Family physicians, hydrostatic, intussusception, paediatrics
polyp causing colocolic intussusception which is otherwise rare in children.\cite{19,16} Presentation are often variable however typical triad of vomiting, abdominal pain and diarrhoea or Red currant jelly stools is the characteristic of intussusception which is found in but 20% patients only. The hallmark physical findings in intussusception are a right hypochondrium sausage-shaped mass and emptiness within the right lower quadrant (Dance sign). Intussusception are often a diagnostic dilemma, however with evolving diagnostic armamentarium and with high index of clinical suspicion it is often diagnosed early and managed with appropriate intervention. The death rate from Intussusception in children is a smaller amount than 1% but if left untreated, this condition is uniformly fatal. Since primary care providers and family physicians are first responders, this case series would help them for differential diagnosis and prompt referrals for further management.

**Case Series**

We treated six cases of intussusception in which five were in paediatric age group and one was adult. All children were admitted, resuscitated well, USG abdomen was done to confirm the diagnosis, written and informed consent for surgery (including stoma consent) and anaesthesia was taken from parents however all were managed successfully by hydrostatic reduction under sedation. Only one child had recurrence after one year who was again treated conservatively. We present this case series to analyse the spectrum of presentation, diagnostic and therapeutic options available with review of literature.

**Case 1**

First patient was a 09-month-old boy who was brought with one day history of alternate irritability (sleep and cry) with poor feeding without any history of fever, diarrhoea or trauma. General physical examination and systemic examination was unremarkable. Child was given symptomatic treatment in the form of antispasmodic and sent back to home. Child was brought back in the same day evening with 2 episodes of vomiting. Again, clinical examination was normal. Haematological and biochemical parameters were normal. As the child was irritable X ray abdomen was skipped and USG of abdomen was done which revealed a Bull’s eye or Target sign on transverse views which results due to a loop of bowel within another loop of bowel [Figure 1]. Hydrostatic reduction with normal saline was done successfully. After uneventful observation of 12 hours child was discharged on next morning.

**Case 2**

Second patient 2 years old male child brought with 2 days history of clear emesis with excessive irritability. Clinical examination was normal except signs of dehydration. All lab parameters were normal. USG of abdomen revealed characteristic Target sign. Successfully treated by hydrostatic reduction and discharged after one day observation.

**Case 3**

Third case was a 19-month-old boy who was treated as viral gastroenteritis for 2 days presented with drowsiness. On examination child was drowsy but easily arousable. No history of trauma. Laboratory parameters were normal. USG abdomen revealed ileoileal intussusception in proximal ileum. Hydrostatic reduction was done and child was normal during observation period of 24 hours.

**Case 4**

Fourth case was 13-month-old girl child who had pain abdomen and vomiting 24 hours. No abnormality was detected on examination. Ultrasound confirmed the diagnosis of ileocolic intussusception and treated by saline hydrostatic reduction.

**Case 5**

Fifth child was a 26-month-old boy who presented with pain abdomen with excessive irritability without any other complaints for the last 24 hours. Abdomen was soft but a mass was palpable at right upper quadrant of the abdomen. USG abdomen clinched the diagnosis of ileocolic intussusception and treated by hydrostatic reduction.

**Case 6**

Our sixth case was a 46 year old male who presented with pain abdomen, nausea, vomiting with obstipation of 24 hours duration. There was no history of surgery in the past and there was no associated comorbid condition. Clinically tachycardia was present. Abdomen was distended and diffusely tender. On digital rectal examination rectum was empty. Standard protocol of subacute intestinal obstruction was followed, and patient was made nil per oral, Ryle's tube was inserted, intravenous fluids and broad-spectrum antibiotics were started. In laboratory parameters only significant finding was leucocytosis (12000/cubic mm). There was no evidence of pneumoperitoneum on X-Ray chest PA view erect. X-Ray abdomen erect and supine revealed dilated jejunal loops with mucosal thickening suggestive of subacute intestinal obstruction [Figure 2]. USG abdomen revealed the characteristic Target or Doughnet sign. CECT abdomen showing round heterogeneous mass lesion in the right iliac fossa suggestive of intussusception [Figure 3]. Now clinicoradiological diagnosis of ileoileal intussusception was made. After taking the written and informed consent for surgery and anaesthesia patient was taken up for exploratory celiotomy. A special consent for stoma was also taken from patient. Laparotomy revealed grossly distended jejunal and proximal ileal loops with ilo- ileal intussusception.

![Figure 1: USG abdomen showing heterogenous echotexture mass lesion with Doughnet / Target sign characteristic of intussusception](image-url)
approximately 12 cm proximal to ileocecal junction with minimal free fluid in peritoneal cavity. Manual reduction of the intussusception revealed solitary, sessile polyp originating from the anti-mesenteric border of the ilium [Figure 4]. V- resection of the polyp taking 1.5 cm of the margins was done and primary closure was done [Figure 5]. Oral fluids followed by soft diet was started on second postoperative morning. Patient was discharged on tenth postoperative day after suture removal. Histopathological examination confirmed it as inflammatory polyp. Colonoscopy and upper GI endoscopy was also done to rule out any synchronous or metachronous lesions. This patient was followed up for 1 year postoperatively and was asymptomatic.

**Discussion**

Intussusception is defined as the introduction of a segment of loop inside the lumen of the contiguous intestinal segment, relatively common in childhood and rare in adults. Complications typically do not occur within first 24 hours, thus serves as window to avoid surgery. Common complications are bowel obstruction, intestinal ischemia, perforation, sepsis, shock and death. An extensive literature review was conducted by means of the following electronic bibliographic databases, Medline and Cochrane Library Online. The accurate global data on incidence and gender preponderance of intussusception cannot be determined due to various confounding variables such as nutritional status, weaning practices, diet, ethnicity, socioeconomically status and environmental factors however broad consensus says that in developed countries in infants and children it varies between 1.5 – 4 cases per 1000 live births and in adults 2 to 3 cases per 10,000000 per annum whereas in developing countries very few countries have this data available. Data on prevalence of types of intussusception says that ileocolic (77%) is the commonest and retrograde (0.2%) is the rarest. There are also conflicting data from developing and developed countries on the existence and importance of seasonal variability in the incidence of acute intussusception but by and large it coincides with spring and summer seasons or the season in which upper respiratory or gastroenteritis illnesses are more frequent. Regarding etiology majority is idiopathic, however in elderly children and adults, pathological lead point is the most accepted theory. Presentation is also variable but pain abdomen with palpable abdominal lump are more commonly encountered symptoms. The classic triad of abdominal pain, vomiting and rectal bleeding is quite inconsistent seen in less 20% of patients. Diagnosis remains a clinical challenge in both developed and developing countries due to its nonspecific nature of symptoms and signs, scarcity of radiological armamentarium or expertise. Treatment is generally conservative like barium enema, air enema, US guided contrast enema, US guided saline enema or sometime gets reduced spontaneously. There is no proper consensus on best conservative method, however USG Guided saline enema is more preferred method may be due to absence of radiation exposure, chemical peritonitis or tension pneumoperitoneum. Surgical intervention is rarely required in children except patient presenting with shock, complicated or recurrent intussusception, prolonged duration of symptoms, transanal prolapse of the intussusceptum, or failed enema reduction, whereas in adult's surgical intervention is the mainstay of treatment. The above findings are very much essential for primary care providers and

![Figure 2: X ray abdomen supine and erect view showing multiple dilated small bowel loops with air fluid levels suggestive of small bowel obstruction](image)

![Figure 3: CECT abdomen showing round heterogenous mass lesion in the right iliac fossa suggestive of intussusception](image)

![Figure 4: Intraoperative picture showing ileoileal intussusception with poly on mesenteric border](image)

![Figure 5: Intraoperative picture showing ileum after resection and primary closure](image)
Intussusception is a surgical emergency that requires prompt diagnosis and management. Diagnosis is challenging due to nonspecific wide-ranging symptoms. Primary care providers and family physician or emergency department surgeon should diagnose it with high index of clinical suspicion and avert the dreaded complications. In children per rectal enema reduction (air/contrast/saline) is the mainstay treatment with 2.5 to 5% recurrence rate but diagnostic delay increases the risk of surgical intervention, hence emphasising the importance of prompt and effective management.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

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