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Case Report

The double target sign as ultrasonographic finding in a case of double intussusception: A case report [☆]

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ABSTRACT

Intussusception is one of the common conditions in children presenting with abdominal pain. The exact etiology of intussusception is unknown. Lead point is not identified in the majority of cases in children. Commonly, radiographic evidence suggests the presence of a target sign is diagnosis of intussusception. However, the presence of a double target sign in the case of intussusception is rare and depicts the presence of double intussusception. We present a case report of a 1-year-old child who presented to the emergency department with excessive crying for more than 10 hours. After the initial clinical assessment and acute management, an abdominal ultrasound revealed a double target sign on the sub-hepatic and left para-umbilical region which suggested double intussusception. No lead point was identified in our case. Early diagnosis and prompt treatment are the mainstay of management in such cases.

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Background

Intussusception is one of the differential diagnoses of abdominal pain in infants and young children. It is a life-threatening condition if not managed promptly. It is a condition in which a part of the intestine slides into the adjacent part of the intestine. The telescoping proximal portion of the intestine (ie, intussusceptum) invaginates into the adjacent distal bowel (ie, intussusciens). It typically involves the small bowel and presents as an abdominal lump. The classic triad of symptoms

includes abdominal pain, vomiting, red currant jelly stools, or abdominal mass [1]. Intussusception is one of the common causes of intestinal obstruction in children between 3 months and 6 years of age [2]. The exact etiology of intussusception is unknown but some nonspecific causes include viral infection with adenovirus, rotavirus vaccination, and sometimes intestinal polyps [3]. Complications of intussusception include dehydration, intestinal obstruction, perforation, and peritonitis [4]. Ultrasound (US) abdomen is a useful screening tool and in cases of intussusception reveals target signs specific to this condition. The presence of a double target sign demon-

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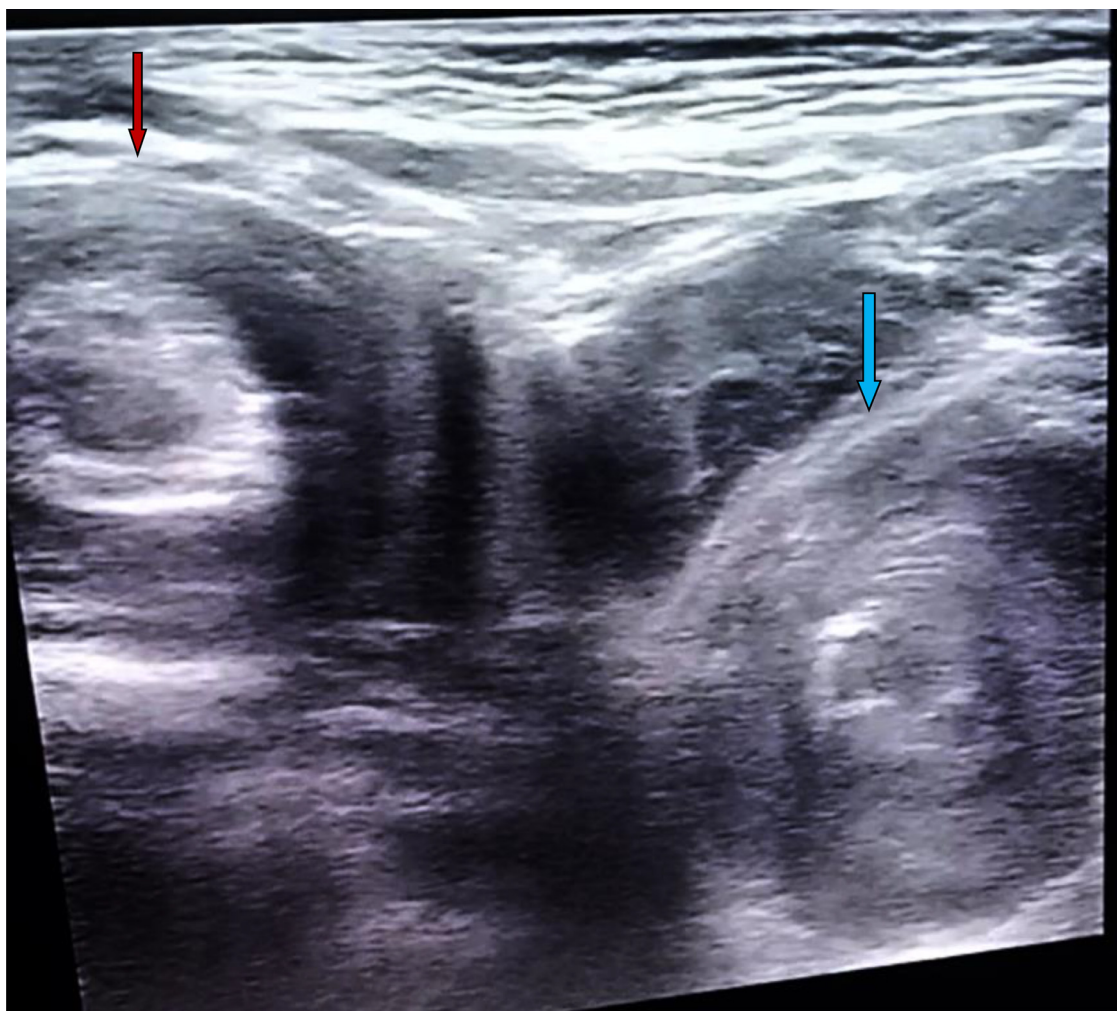


Fig 1 – Cross-sectional USG showing alternate hyperechoic and hypoechoic circular structure in subhepatic (red arrow) and left paraumbilical (blue arrow) region giving double target sign.

strates double intussusception, a rare condition, which is often idiopathic but is also reported in cases of Peutz-Jeghers Syndrome [5].

Case presentation

A 1-year-old male child was brought to the emergency department with complaints of excessive crying for more than 10 hours and the child cried upon touching the abdomen. The child was given pain killers from a local pharmacy for the same. According to the mother, there was no history of fever, coryza, urinary problems, loose stools, blood in stool, rashes, trauma, and convulsions. However, the mother gave a history of excessive crying of her child intermittently and some episodes of non-bloody vomiting during the attacks. There was no past history of similar illness in the patient and was born at term in the hospital. His birth weight was 2.7 kg. He has been immunized to date according to the immunization

schedule. The patient's developmental milestones were appropriate for his age and apart from illness, he has no other congenital abnormalities.

On physical examination, the patient was crying in pain and the consciousness was normal. His head circumference, chest circumference, abdominal circumference, length, and weight were within normal limits. His respiratory rate, pulse rate, blood pressure, and temperature were normal for his age. He was anicteric and no significant findings on general examination were noted. His hernia orifices were intact. Furthermore, there were no signs of dehydration. The rest of the examinations were normal. Systemic examinations were normal except for pain abdomen, which was demonstrated when the child cried whenever touched. Routine investigations were done which revealed an increment in total cell count, hemoglobin was 11.9 gm/dL. Liver and renal biochemical parameters were within normal limits. Finally, US of the abdomen and the pelvis was planned to rule out causes of acute abdomen. USG findings revealed the presence of alternating concentric layer of hyperechoic and hypochoic band



Fig. 2 – After successful hydroreduction with a normal sign showing disappearance of target sign.

giving double target sign in subhepatic and left paraumbilical regions (Fig. 1: showing target sign marked by arrows) which confirmed the diagnosis of intussusception, one of the most common differential diagnoses of abdominal pain.

The patient was treated successfully with hydroreduction (Fig. 2: showing disappearance of target sign with bowel loop filled with fluid). In this procedure, an 18F Foley catheter was inserted into the rectum after lubrication with xylocaine jelly. The balloon of the catheter was inflated by injecting 20 mL of distilled water. One and a half liter of prewarmed normal saline was suspended 150 cm above the bed level and connected to the catheter via an IV set line. Then, normal saline run freely into the rectum with the effect of gravity. Under real-time US, gradual distension of the large bowel, disappearance of intussusception, and passage of fluid from the caecum into the terminal was observed. Serial follow-up ultrasound was done after 8 hours, 16 hours, and 24 hours which doesn't show intussusception. The patient was then discharged after 24 hours.

Discussion

Intussusception is one of the common causes of abdominal pain in children and is the most common cause of intestinal obstruction in children. Children with intussusception present with a wide range of nonspecific symptoms including abdominal pain, vomiting, irritability, loose stools, and decreased appetite. The classic triad of colicky abdominal pain,

vomiting, and red currant jelly stools occurs in about one-fourth of the cases [3]. So, many of the cases often remain undiagnosed or misdiagnosed as caused by other etiologies including bacterial or amoebic dysentery, and are often treated with antibiotics without finding out the exact etiology.

Early diagnosis and treatment are crucial in the management of childhood intussusception where most cases are idiopathic [3]. Involvement of mesenteric lymphoid hyperplasia or hypertrophied lymphoid tissue in the wall of the intestine due to viral infections such as adenovirus, rotavirus vaccination [5] and bacterial infections including yersinia pseudotuberculosis and staphylococcus aureus in some cases have been identified [6]. The most common site is the terminal ileum where the lymphoid tissues. Are abundant in children. Younger infants do not have a specific lead point whereas children more than 3 years show the presence of a lead point. Meckel's diverticulum is present as lead point in 6 % of the cases [7]. Other lead points include polyps, carcinoids, cysts, leiomyoma, angiofibroma, and buried appendectomy stump [6].

US is a widely used screening tool for diagnosing intussusception since it is portable can be performed at the bedside and is radiation free. Findings on ultrasonography reveal intussusception as a round mass with a target bowel-in-bowel appearance in the transverse plane [4]. The target sign also known as the doughnut sign or bull's eye sign appears as concentric alternating echogenic and hypoechoic bands which are formed by mucosa and muscularis as well as submucosa respectively [7]. Lymph nodes or the appendix may also be noted within the intussusceptum, Double target sign appears

when there is the presence of intussusception in 2 different sites [7]. Double intussusception is a very rare condition. Study done by Krasniqi et al. [7] shows a rare case of double ileocolic intussusception in an adult patient. US is also helpful in diagnosing lead points [7] of the condition as well as in the assessment of complications beforehand. Furthermore, ultrasonography is also helpful in finding an alternate diagnosis [8]. Moreover, US has been used as a safe guidance tool for hydrostatic and pneumatic reduction of childhood intussusception [8] which implicates the role of US in diagnosis as well as management.

Treatment options include conservative and surgical management. Hydro-reduction with normal saline, barium enema, and air contrast enema are various modalities of conservative management [3]. Reduction is confirmed if there is free flow of normal saline/ barium/ air into terminal ileum, disappearance of mass and child becomes comfortable [1]. Previously, it has been suggested that a conservative reduction of lead point intussusception is not possible. However, recent study shows successful reduction of lead point by conservative methods [6]. Contraindication of conservative management include symptoms greater than 48 hours, signs of intestinal obstruction on abdominal radiography, and signs of peritonitis. Surgical management include operative reduction by milking the back of intussusception by compressing bowel loops just distal to it. If reduction is not achievable/ gangrenous bowel loops seen, resection anastomosis has to be done [1].

Conclusion

Intussusception is one of the common conditions in childhood and presents as abdominal pain, vomiting, and red currant jelly stool. It can be diagnosed with the help of clinical symptoms and is supported by ultrasonography. Double target sign in cases of intussusception suggests the presence of double intussusception which is a rare finding. So in case of intussusception while performing USG it is essential to scan whole abdomen and not only the subhepatic region as there may be double intussusception in same patient. Thus, ultra-

sonography in cases of intussusception is not only essential for diagnosis but is also essential in determining the therapeutic choice which includes non-surgical reductions thereby substituting the classic surgical techniques.

Patient consent

Written informed consent for publication of this case report was obtained from parent of patient.

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