Case Report

A COINCIDENTAL FINDING: TYPE 1 INTESTINAL MALROTATION IN AN ADULT INITIALLY DIAGNOSED BY ULTRASOUND

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ABSTRACT

Embryologic failure of rotation of the midgut around the superior mesenteric artery results in intestinal malrotation. Although most of these malrotations give symptoms in the neonatal period, they can be seen in adulthood.

We describe a case in which color Doppler study showed superior mesenteric vein on the left of superior mesenteric artery during an investigation of hematemesis and abdominal pain, with a type 1 malrotation. We believe that position of superior mesenteric artery and vein should be carefully checked during routine US examinations, as this can be the first clue of missed malrotation.

Key Words: Intestinal malrotation, adult, US, Doppler US

INTRODUCTION

Intestinal malrotations give symptoms in the neonatal period and are caused by the failure of rotation of intestines during the gestational period. Onset of symptoms in adulthood is extremely rare.

Malrotations can be observed coincidentally during investigation of hematemesis. In this case, routine abdominal ultrasound (US) examination for investigation of abdominal pain and hematemesis showed that superior mesenteric artery (SMA) was located on the right of superior mesenteric vein (SMV). Contrast examination of upper gastrointestinal system and colon after barium meal, following US, showed Type 1 malrotation and an ulcer in the duodenum, which was the cause of hematemesis and abdominal pain.

CASE REPORT

A sixty-two year old man was referred to our clinic for investigation of abdominal pain and hematemesis etiology. Biochemical studies and urine analysis were normal. In US examination SMV was located on the left side of the SMA (Fig. 1). In the barium examination of the upper gastrointestinal system an ulcer was detected in the second portion of the duodenum. Third and fourth portions of the duodenum, and duodenojejunal junction were on the right upper quadrant (Fig. 2). In the oral colon contrast examination jejunum was on the right and ileum was in the middle, cecum, appendix and ascending colon were on the left (Fig. 3).

DISCUSSION

Malrotations can be classified according to the three stages of normal rotation as types 1, 2, 3 (1, 2). Small intestine is a part of the midgut which extends from the duodenojejunal junction to the mid-transverse colon. At fifth weeks of gestation, the primitive gut and liver grow so rapidly that there is no enough space for them in the abdomen.The midgut herniates out of the umblicus and returns, after ten weeks of gestation, when there is more room. During this period, intestines rotate counter-clockwise at 270 degrees around the SMA. This period is divided into three stages : 1) Before the umbilical herniation, 2) Umbilical herniation, 3) Following the return to the abdominal cavity. In case of an error during this period, rotation anomalies come out;

Type 1 Malrotation, Nonrotation: This results from an error in rotation before 6 weeks of gestational age. Small intestine is located on the right, colon including cecum is located on the left.

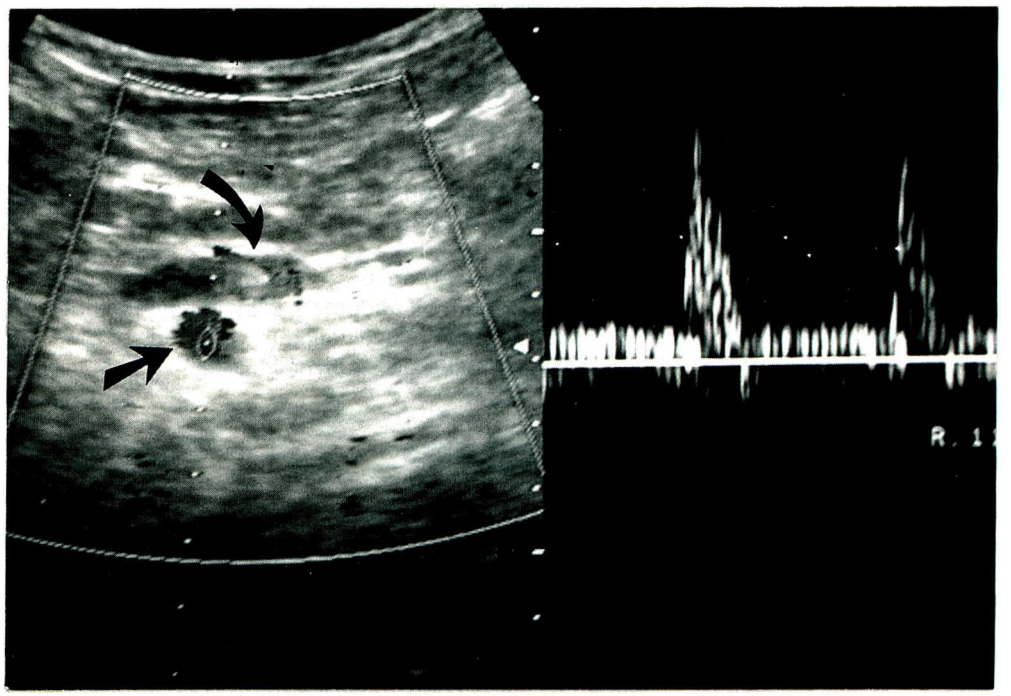

Fig.1: Color Doppler examination shows that superior mesenteric artery (straight arrow) is on the right side behind the superior mesenteric vein (curved arrow).

Fig.2: Barium examination shows jejunum on the right side of the abdomen.

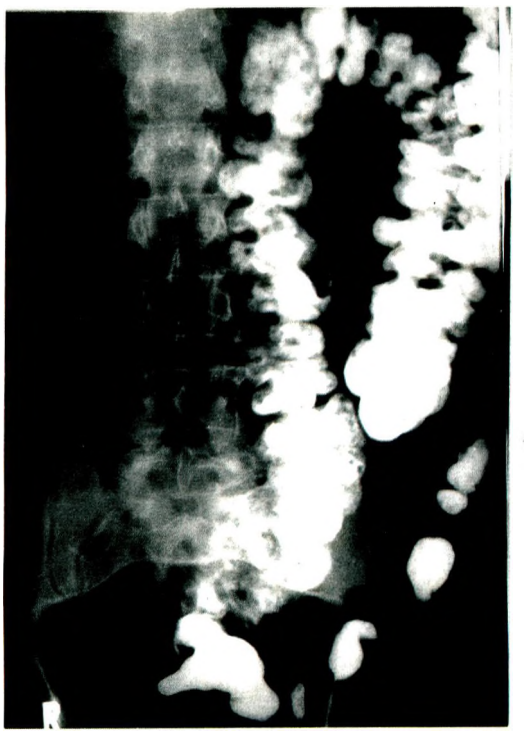

Fig.3: Oral barium contrast examination shows the cecum on the left side. At the same time, other colon segments are located on the left side of the mid-line.

Type 2 Malrotation, Reversed Malrotation, Duodenal Malrotation: This results from an error in rotation between 6th week to 10th week of gestational age. Primarily duodenum is affected. Duodenum ends up either in front of the SMA or obstructed by Ladd's bands. Transverse colon lies below the origin of the SMA.

Type 3 Malrotation, Incomplete Rotation: This results from an error in rotation after 10 weeks of gestational age. Cecum may be located on the right, in the middle or on the left of the abdominal cavity. Because of abnormal rotation, peritoneal bands (Ladd's) may pass through the second portion of the duodenum to the right posterolateral abdominal wall (1, 2). This is the most frequent type (3).

As symptoms are related to the partial or complete bowel obstruction caused by peritoneal bands, volvulus or internal hernie, malrotations are most frequently detected during the neonatal period, especially when symptoms detected during early infancy are intermittent (1-3).

Most cases of intestinal malrotation begin in the neonatal period. 55% occurs in the first week and 80% in the first month of life (4).

The first accurate description of the embryology of the midgut and malrotation in adults was reported by Mall in 1898 (5). Malrotation can also be observed in adults, usually with symptoms of bowel obstruction (4). Ingram and Gardner reported one patient with concurrent appendicitis (6) and Korn et al. reported one patient with duodenal ulcer as the initial symptom (7).

At ultrasonography relative position of the SMA and SMV may be different. Weinberger et al. reported malrotation in all 5 patients, in which SMV was on the left side of the SMA and 1 out of 4 patients in which SMV was ventral to the artery (8). Ultrasonography in our case, showed that SMV was on the left of the SMA. This US finding alerted us to the possibility of malrotation.

Initial symptoms of the patient were hematemesis and abdominal pain. Contrast gastrointestinal system examination showed right sided small intestines, and left side cecum and ascending colon, giving a diagnosis of Type 1 malrotation.

Because intestinal malrotation is an uncommon diagnosis, familiarization with this concept help us avoid confusing interpretations and errors in the radiologic diagnosis.

These cases can be found out during routine US examination of abdomen. We conclude that care must be taken in evaluating the positions of SMA and SMV in routine US examinations.

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