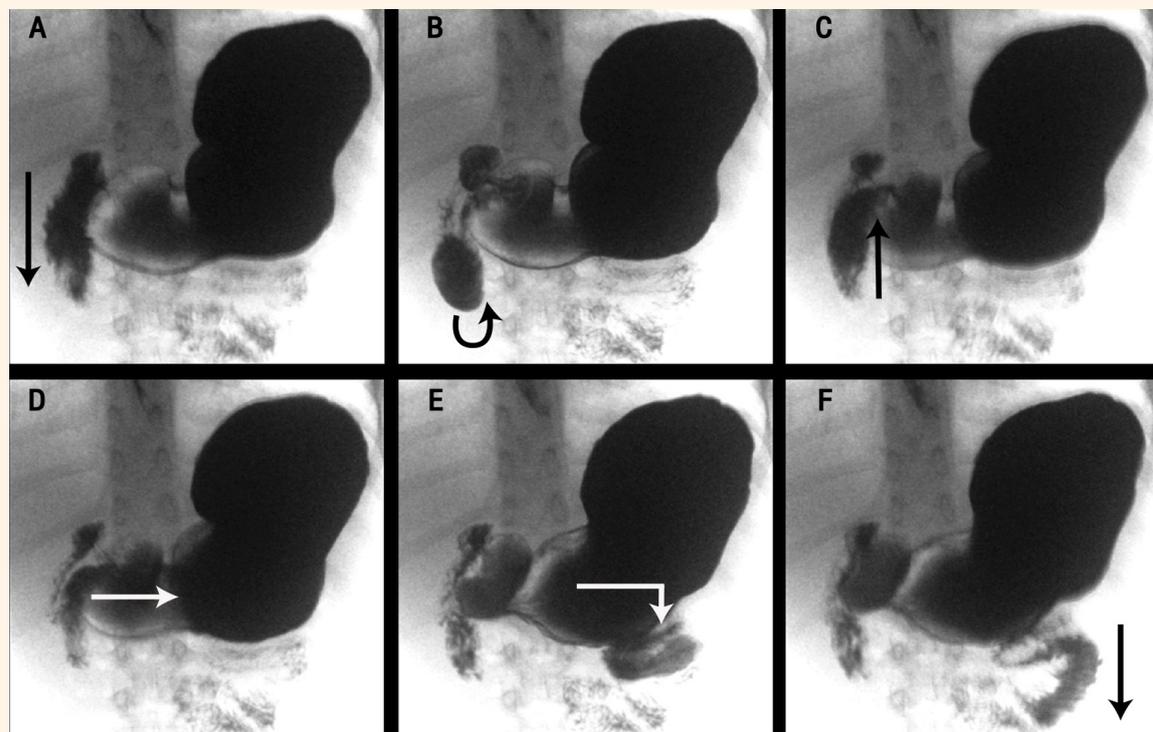


## Duodenum *Inversum* Findings from an upper gastrointestinal series

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### القولون الإثني عشر المنقلب نتائج من صور متتالية للجهاز الهضمي العلوي

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**Figure 1A–F:** Sequential images from an upper gastrointestinal series of a 12-year-old girl showing the (A) normal appearance of the first and second parts of the duodenum and the (B) third part of the duodenum bending over the second part and (C) continuing with a vertical orientation. Subsequently, the (D) duodenum crosses the midline to the left and the (E) duodenojejunal junction is located normally at the level of the bulb. Finally, the (F) proximal jejunal intestines are located in the left upper quadrant. The arrows show the route of the barium contrast medium.

**A** 12-YEAR-OLD GIRL WITH A HISTORY OF occasional nausea and vomiting for the previous 4–5 years was admitted to the Erciyes University Children’s Hospital, Kayseri, Turkey, in 2014 after the frequency of these symptoms had increased. For the previous six weeks, she had been vomiting 6–7 times per day and had lost 3 kg in weight. The laboratory findings and a physical examination were unremarkable except for non-specific epigastric tenderness. An upper gastrointestinal series (UGIS)

was performed using a fluoroscopy device and barium contrast medium; this revealed that the third part of the duodenum was vertically oriented and subsequently crossed the midline to the left to form the duodenojejunal junction in the normal location, at the level of the bulb [Figure 1]. Based on these findings, a diagnosis of duodenum *inversum* was made. In addition, gastroesophageal reflux was observed.

An endoscopic biopsy revealed peptic oesophagitis and chronic gastritis. There was no evidence

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of duodenal obstruction, only duodenum *inversum* as seen during the UGIS. The patient was therefore prescribed 20 mg of oral omeprazole daily. Her symptoms gradually resolved and she was noted to have gained 4 kg at a three-month follow-up evaluation.

## Comment

Duodenum *inversum*, also known as inverted duodenum or duodenum *reflexum*, is a rare congenital anomaly of duodenal configuration which results in the third part of the duodenum bending over onto the second part posteriorly and crossing the midline at a more cephalic level than expected, subsequently forming the duodenojejunal junction at its original site.<sup>1-6</sup> In an UGIS, radiological signs of duodenum *inversum* following the introduction of a contrast substance are as follows: (1) return of the contrast substance from the second into the first part of the duodenum and then into the bulb more frequently; (2) *stasis* in the duodenum; and (3) rapid passage of the contrast medium through the third stage.<sup>2</sup>

While the aetiology of duodenum *inversum* is unknown, it is believed to be due to the persistence of the dorsal mesentery with a mobile duodenum.<sup>5</sup> Determining the normal location of the duodenojejunal junction is important in differentiating duodenum *inversum* from intestinal malrotation.<sup>1-3</sup> Patients with duodenum *inversum* are often asymptomatic, although they may present with obstructive symptoms, epigastric pain, bloating, nausea and vomiting. Furthermore, duodenum *inversum* may

predispose patients to diseases such as cholecystitis, pancreatitis and peptic ulcers.<sup>1-6</sup> These symptoms and comorbidities are thought to be due to *stasis* in the duodenum.<sup>6</sup> Clinicians must therefore be aware of possible comorbidities in patients with duodenum *inversum*.

For symptomatic patients with peptic ulcers and without duodenal obstruction, pharmacological treatments are advised, including antacids, antispasmodics and anti-ulcer agents; however, if a duodenal obstruction is present, surgery is the treatment of choice.<sup>1</sup> Although limited in number, studies have shown favourable outcomes for both surgical and pharmacological interventions.<sup>1,3,4</sup>

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