

Situs Inversus Totalis: A Mirror Woman

ABSTRACT

Situs inversus totalis (SIT) is a rare anatomical anomaly where the internal organs are oriented in a mirror-image fashion compared to typical human anatomy. Radiographic techniques play a crucial role in identifying and elucidating these anatomical variations. It is essential for medical practitioners to be vigilant for this anomaly during preoperative evaluations.

Keywords: Congenital abnormalities, mirror woman, situs inversus totalis

Situs inversus totalis (SIT) typically has minimal impact on an individual's quality of life, with affected persons often demonstrating normal functional capacity. Given its rarity, most radiologists, clinicians, and surgeons have limited experience in managing these patients. Recognizing this congenital deviation becomes paramount in emergency settings. Consequently, both clinical and radiological evaluations should always consider the possibility of SIT in patients.

CASE REPORT

A 65-year-old woman underwent radiological assessments due to continuous abdominal discomfort that persisted for an estimated duration of one year. In her posteroanterior chest radiographic image, the cardiac silhouette, the gastric air bubble, and hepatic shadows are notably misplaced (Figure 1). Subsequent comprehensive imaging, including abdominal sonography and magnetic resonance diagnostics, confirmed the hepatic and biliary structures to be situated on the left, in contrast to the spleen on the right (Figure 2 a,b - Figure 3). Importantly, the pancreatic head was discerned on the left side, while its

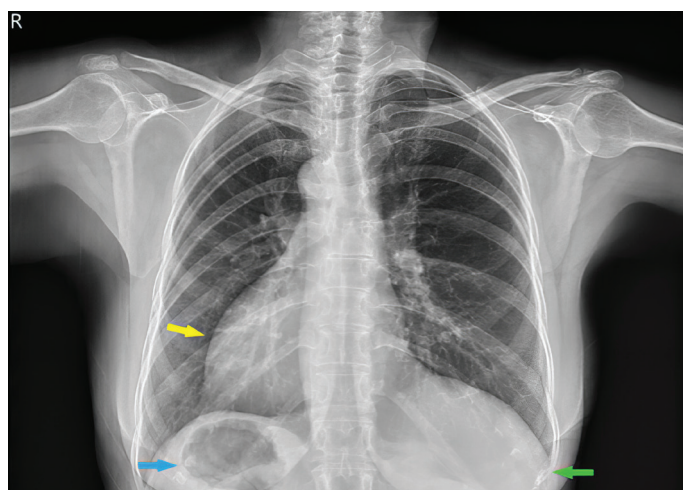


Figure 1: Posteroanterior chest radiographic image, demonstrating the cardiac apex on the right side (yellow arrow), gastric bubble on the right (blue arrow), and the hepatic shadow on the left side (green arrow).

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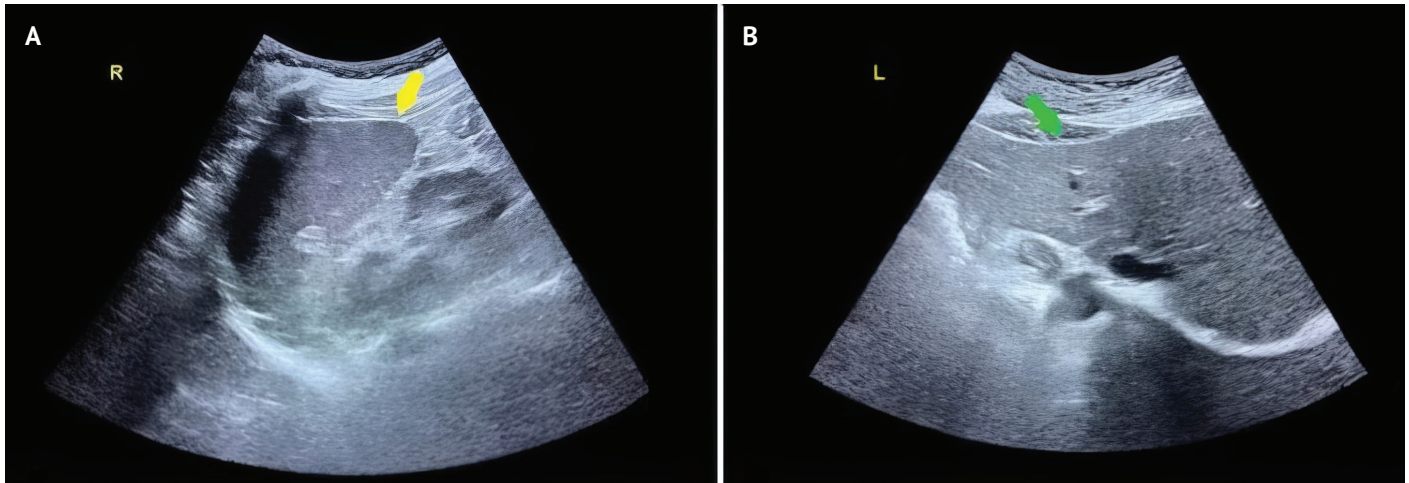


Figure 2: An ultrasound image of the right hypochondrium region shows a right-sided spleen (yellow arrow) (A), and the left hypochondriac region shows the liver (green arrow) (B).

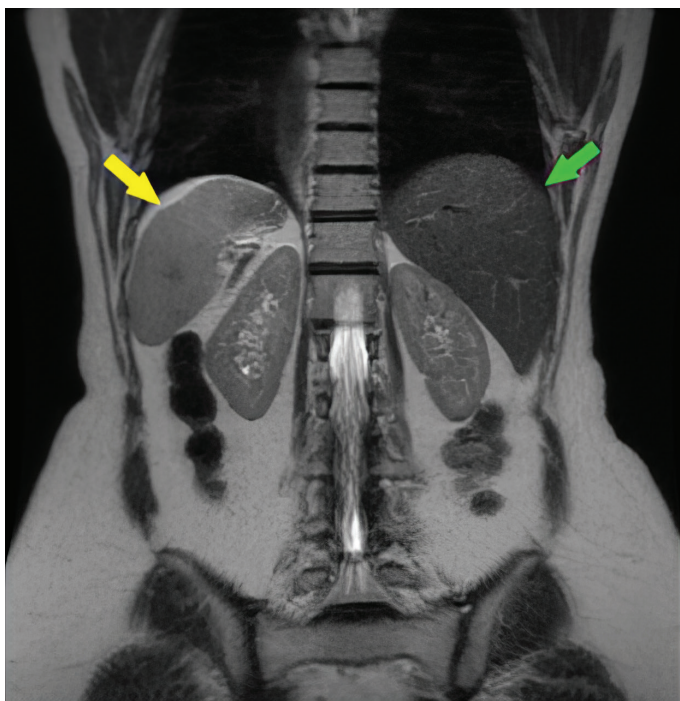


Figure 3: The coronal T2-weighted magnetic resonance imaging shows the transposition of the spleen and liver (yellow and green arrows).

corpus and caudal regions projected rightward (Figure 4). Moreover, a total positional anomaly of the abdominal aorta and the inferior vena cava was identified (Figure 5).

DISCUSSION

Within the scientific literature, three distinct situs conditions have been identified: (1) situs solitus, where the organs maintain their standard anatomical orientation, (2) SIT, wherein the organ placement is transposed, presenting as a mirrored version of the conventional anatomy, and (3) situs ambiguous, characterized by the atypical positioning of the viscera, combined with non-deterministic

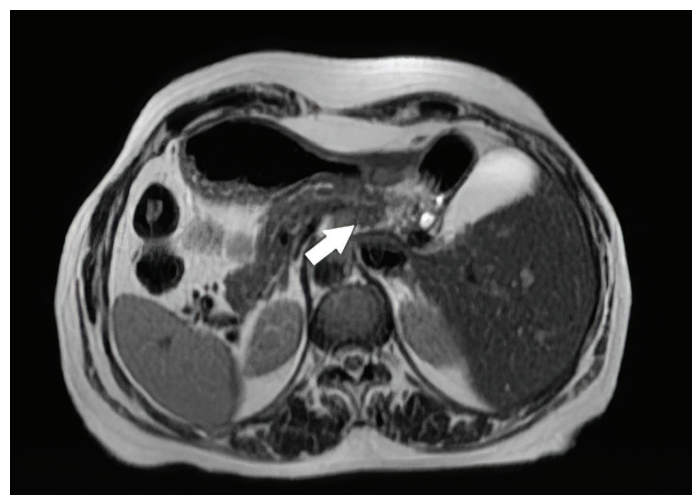


Figure 4: Axial T2-weighted magnetic resonance imaging shows the pancreas head in the left hypochondrium region (white arrow).

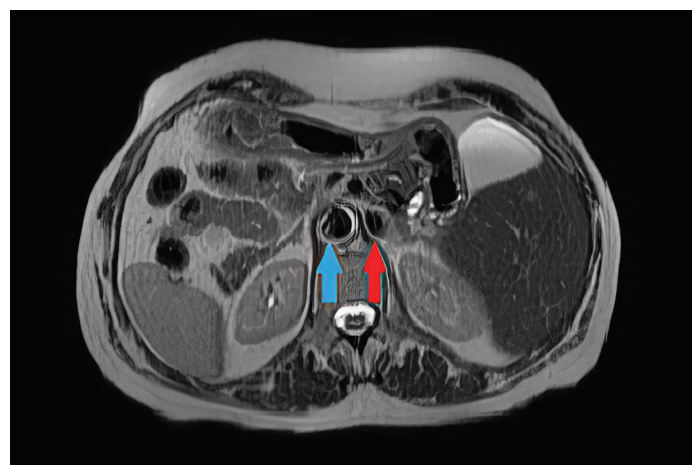


Figure 5: Axial T2-weighted magnetic resonance imaging shows the abdominal aorta on the right (blue arrow) and the inferior vena cava on the left (red arrow).

atrial arrangement (1). The first comprehensive description of situs inversus was provided by Severinus, highlighting a full inversion (2). The prevalence of SIT varies between 1/8,000 and 1/25,000, with a slight male predominance at a ratio of 1.5:1 (3). The genesis of SIT can be traced back to genetic mutations during early embryogenesis (4). Ultrasonographic and sectional imaging methods serve as pivotal tools for delineating the precise positioning of solid organs. In such contexts, it is essential to discern that the bowel exhibits an inverse orientation, rather than being malrotated (5). Individuals diagnosed with SIT typically exhibit normal functional capacity. However, SIT can be associated with several anatomical irregularities, including a truncated pancreas, bilateral lobulation of the liver, biliary atresia, the absence of the gallbladder, genitourinary variations, and the presence of asplenia or polysplenia; additionally, there can be transpositions in the vasculature, neural pathways, and lymphatic systems (6). In the case under discussion, both the abdominal aorta and the inferior vena cava displayed a full inversion anomaly. During surgical interventions, adaptations in the placement of monitors, surgical ports, instruments, and the spatial alignment of the surgical team are imperative to ensure effective surgical outcomes (7). SIT presents heightened complexities for clinicians, both in terms of diagnosis and the management of medical and surgical conditions. Surgical interventions conducted on SIT patients can introduce challenges related to orientation and technical execution.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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