Patient With Situs Inversus Stabbed In The Right Flank

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Citation

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Abstract

A situs inversus is a congenital condition in which the positions of the major visceral organs are reversed. This autosomal-recessive genetic condition can be X-linked or found in identical twins. The frequency of situs inversus varies among different populations: it is less than 1 in 10 000 people, with a 5-10% prevalence of congenital heart disease, most commonly transposition of great vessels. The incidence of congenital heart disease is 95% in situs inversus with levocardia. Here we present a 29-year-old male who was admitted in the Surgical Ward, Vryheid Hospital, Kwazulu Natal Province, for suffering from a right flank stab in the abdomen. Dextrocardia was confirmed after doing a physical examination and a preoperative chest x-ray. The patient suffered from a septic shock and he needed to be resuscitated. Laparotomy revealed situs inversus (with appendix and liver lying on the left side of the abdomen, stomach and sigmoid colon on the right side), generalized peritonitis due to a perforated small-bowel loop and a sigmoid mesentery laceration. Evacuation of peritonitis, resection of perforated bowel, end-to-end anastomosis in two layers with Vicryl 2/0, placement of a suction drain (6mm) and wash-out with saline solution were done as operative procedures. The patient's postoperative evolution was good and uneventful and he was discharged on the eighth postoperative day. The recognition of situs inversus is important for preventing surgical mishaps that result from the failure to recognize the reversed anatomy or an atypical history.

INTRODUCTION

Marco Severino first recognized dextrocardia in 1643. More than a century later, Matthew Baillie described the complete mirror-image reversal of the thoracic and abdominal organs in situs inversus. The situs describes the position of the cardiac atria and viscera [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]. Situs solitus is the normal position, and situs inversus is the mirror image of situs solitus. The cardiac situs is determined by the atrial location. In situs inversus, the morphologic right atrium is on the left, and the morphologic left atrium is on the right. The normal pulmonary anatomy is also reversed so that the left lung has 3 lobes and the right lung has 2 lobes. In addition, the liver and gallbladder are located on the left, whereas the spleen and stomach are located on the right. The classification of situs is independent of the cardiac apical position. The terms levocardia and dextrocardia indicate only the direction of the cardiac apex at birth; they do not imply the orientation of the cardiac chambers. In levocardia, the base-to-apex axis points to the left, and in dextrocardia, the axis is reversed. Isolated dextrocardia is also termed situs solitus with dextrocardia The cardiac apex points to the right, but the viscera are otherwise in their usual positions. Situs inversus with dextrocardia is also termed situs inversus totalis because the cardiac position as well as the atrial chambers and abdominal viscera are a mirror image of the normal anatomy. The remaining internal structures are also a mirror image of the normal. Situs inversus totalis that is associated with primary ciliary dyskinesia is known as Kartagener syndrome [11, 12, 13].

Situs ambiguous/heterotaxis: The situs can not be determined (the liver may be in the middle, the spleen absent or multiple and the bowel malformed).

Situs inversus with dextrocardia: The heart is on the right side of the thorax.

Situs inversus with levocardia: The heart remains on the normal left side of the thorax.

Situs inversus with levocardia, dextrocardia without situs inversus: Much higher rates of congenital heart defects than in situs inversus with dextrocardia.

In the absence of congenital heart defects, a person can lead a normal healthy life without any complications related to the medical condition.

CAUSES

About 25% have an underlying condition called primary

ciliary dyskinesia (PCD) caused by a defect in the cilia impairing their normal movement. The normal functioning cilia determine early embryological development of internal organs: hence, individuals with PCD have a 50% chance of developing situs inversus.

CASE REPORT

A 29-year-old male was admitted in the Surgical Ward on a Saturday for suffering from a right flank stab in the abdomen; the doctor on call was unable to transfer the patient to a surgical unit on call. On Monday, after doing the physical examinations and preoperative x- rays, Dextrocardia was confirmed [1]. The patient needed to be treated vigorously, because he developed a septic shock with severe electrolyte imbalance. He had an acute abdomen due to peritonitis and was operated on the next day.

OPERATIVE FINDINGS

Figure 1

Figure 1: Intra-operative picture showing the cecum and appendix in the left iliac fossa

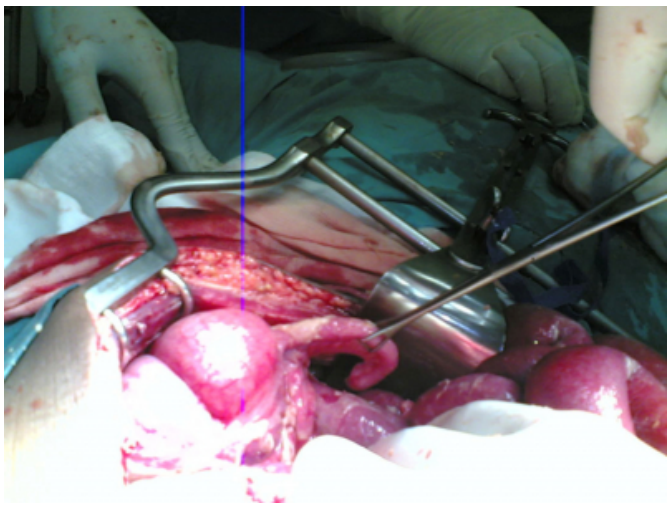


Figure 2

Figure 2: Intra- operative picture showing the liver and gallbladder located in the left hypochondrium

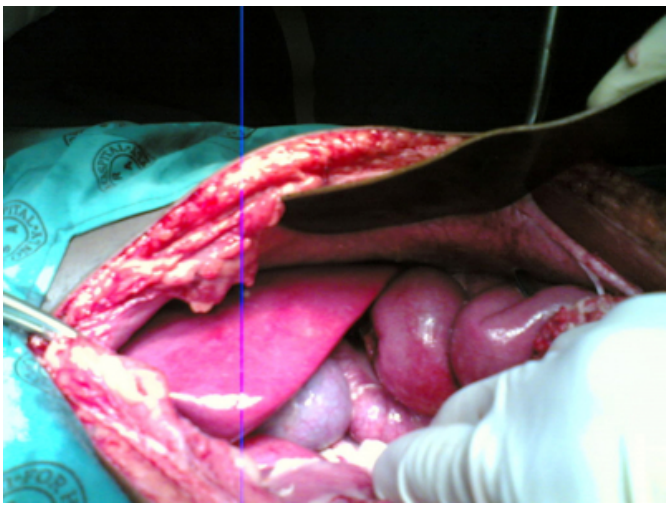


Figure 3

Figure 3: Intra-operative picture showing the sigmoid colon in the right iliac fossa

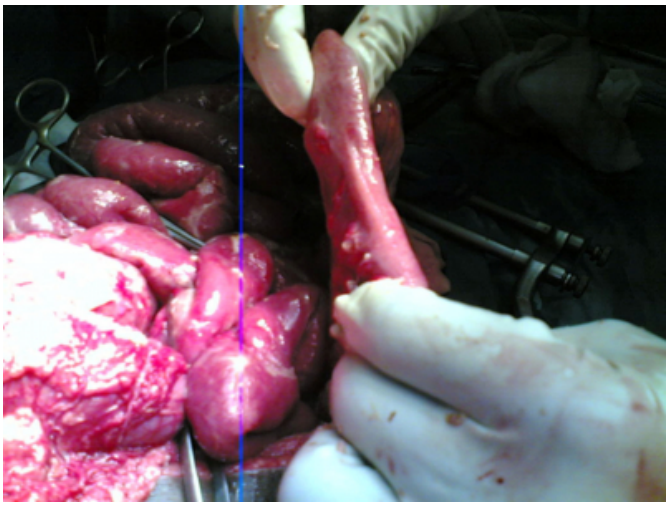
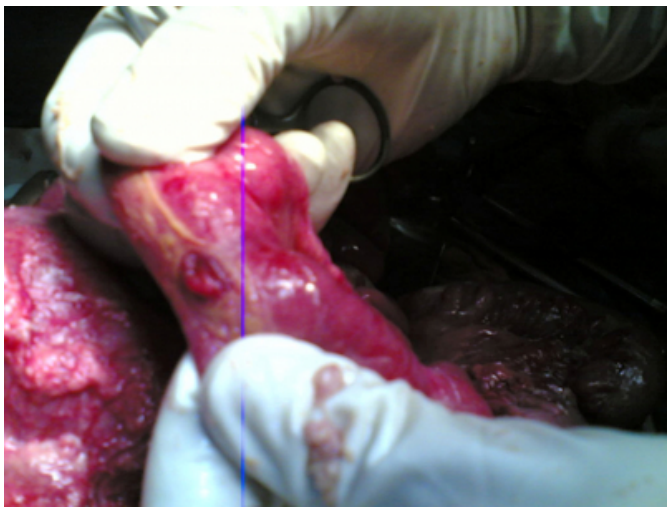


Figure 4

Figure 4: Perforated small-bowel loop, injured through a sigmoid mesentery injury



Surgical procedure: laparotomy, evacuation of peritonitis, resection of perforated bowel, end-to-end anastomosis in two layers with Vicryl 2/0, placement of a suction drain (6mm) and wash-out with saline solution. The abdominal wall closure was done with Prolene sutures. Skin closure was performed with interrupted nylon stitches.

Post-operative evolution: The patient had a proper post-operative evolution; he passed flatus at 48hours and the vital signs were recorded within normal limits. He was discharged satisfactorily on the eighth postoperative day.

DISCUSSION

A situs inversus is a congenital condition in which the positions of the major visceral organs are reversed. This autosomal-recessive genetic condition can be X-linked or found in identical twins [1, 2, 3, 4, 5, 6]. Situs inversus occurs more commonly with dextrocardia [14]. This condition affects all major structures within the thorax and abdomen; generally the organs are simply transposed through the sagittal plane. The frequency of situs inversus varies among different populations: it is less than 1 in 10 000 people with a 5-10% prevalence of congenital heart disease, most commonly transposition of great vessels. The incidence of congenital heart disease is 95% in situs inversus with levocardia. It is important to rule out a Kartagener's syndrome [11, 12, 13] in a patient affected by chronic sinusitis or/and bronchiectasis.

Race: No racial predilection exists for situs inversus.

Sex: The male-to-female incidence ratio is 1:1.

Age: Situs abnormalities are congenital.

DIAGNOSIS: Physical exam, U/S, CT scan, MRI. The recognition of situs inversus is important for preventing surgical mishaps that result from the failure to recognize the reversed anatomy or an atypical history. For example, in a patient with situs inversus, cholecystitis typically causes left upper quadrant pain, and appendicitis causes left lower quadrant pain. A trauma patient with evidence of external trauma over the ninth to eleventh ribs on the right side is at risk for splenic injury. If surgery is planned on the basis of radiographic findings in a patient with situs inversus, the surgeon should pay careful attention to image labeling to avoid errors such as a right thoracotomy for a left lung nodule.

TREATMENT: With any cardiac abnormalities – refer to a cardiologist.

COMPLICATIONS: In organ transplantation.

PROGNOSIS: Good, in the absence of heart defect. Life expectancy is normal.

PREVENTION: There is no known method of preventing situs inversus.

CONCLUSION

A good conclusion from this case would be to consider a situs inversus as a possible operative finding in patients admitted as emergency with dextrocardia or other cardiovascular abnormalities, chronic sinus infection and/or bronchiectasis. A pre-operative chest x-ray and detailed physical examination have been helpful in early diagnosis and may have anticipated unexpected findings, especially during extra hours on call periods. As the scientific medical literature shows that in the patients affected by situs inversus a 5-10% prevalence of congenital heart disease has been found (most commonly transposition of great vessels), this fact should be kept in mind by the attending physician in order to advice proper follow-up of these patients.

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