



Superior mesenteric artery syndrome complicated by gastric perforation: a case report

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INTRODUCTION

Superior mesenteric artery (SMA) syndrome, also known as Wilkie's syndrome, is a rare vascular disorder characterized by compression of the duodenum between the SMA and the aorta [1]. It has an incidence of 0.1-0.3% and commonly affects individuals aged 10-39 years, with a female predominance [2,3]. Due to its nonspecific symptoms, delayed diagnosis can lead to severe complications, including gastric or duodenal obstruction and perforation [6,8]. We report a rare and severe complication of Superior mesenteric artery (SMA) syndrome, where delayed diagnosis led to gastric perforation in a young adult male.

DESCRIPTION

We present the case of a 22-year-old Indian male who presented with severe, progressive postprandial abdominal pain. His symptoms were nausea, vomiting, and an inability to pass stool and gas for 48 hours. On admission, he had tachycardia, tachypnea, and hypotension. His initial laboratory tests showed leukocytosis with neutrophilia, significantly elevated lipase and amylase levels, and prolonged coagulation times. Abdominal X-ray findings suggested intestinal perforation (figure 1) requiring an urgent Computed tomography (CT) scan. CT scan revealed massive gastric dilation and duodenal obstruction with a reduced SMA-aorta angle and aortomesenteric distance, which are consistent with SMA syndrome. (figure 2)

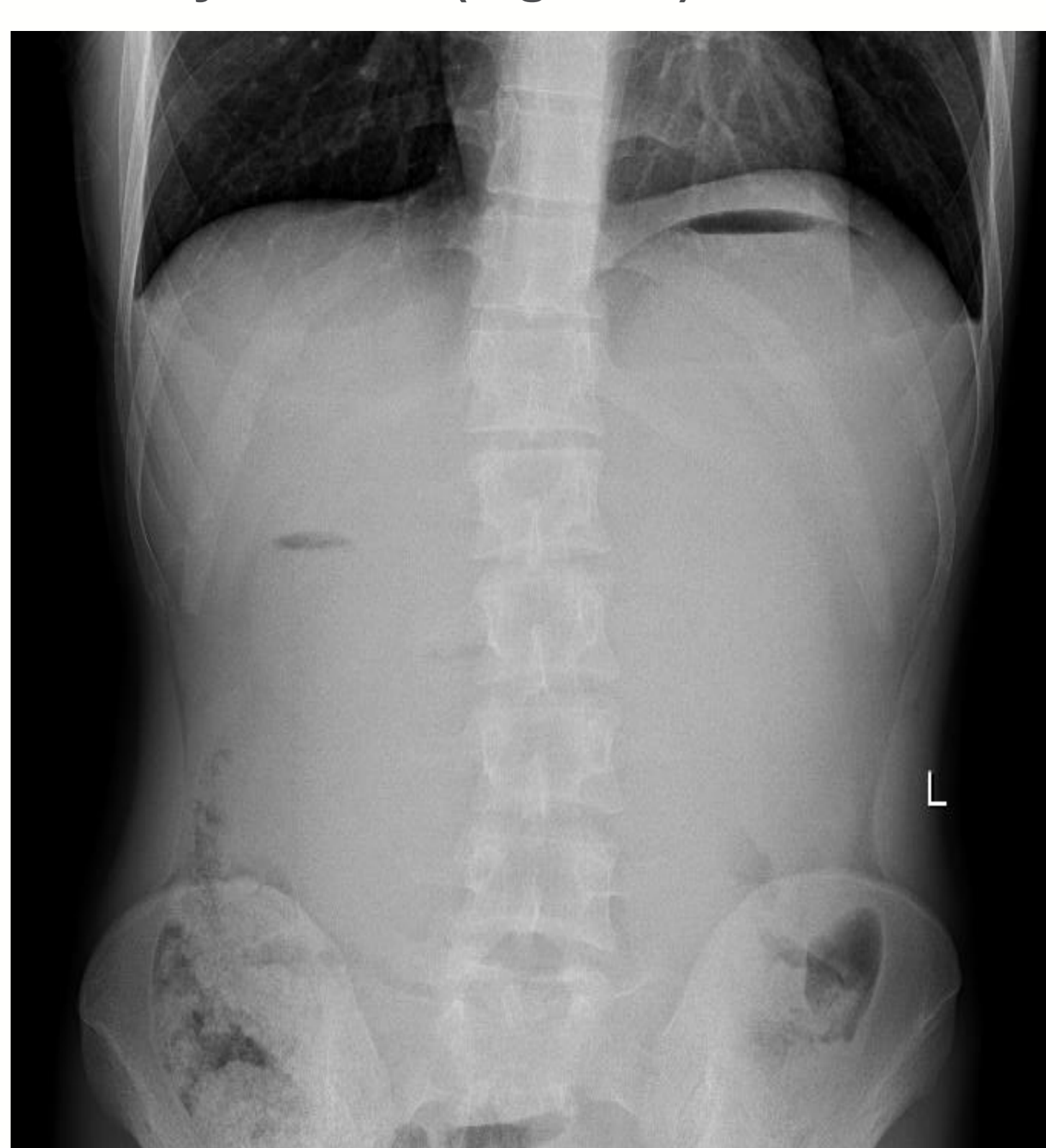


Figure 1. Abdominal X-Ray showing moderate free air shadow with air-fluid level in the upper abdomen (Red arrow). Bowel gas and soft tissue shadows are minimal.

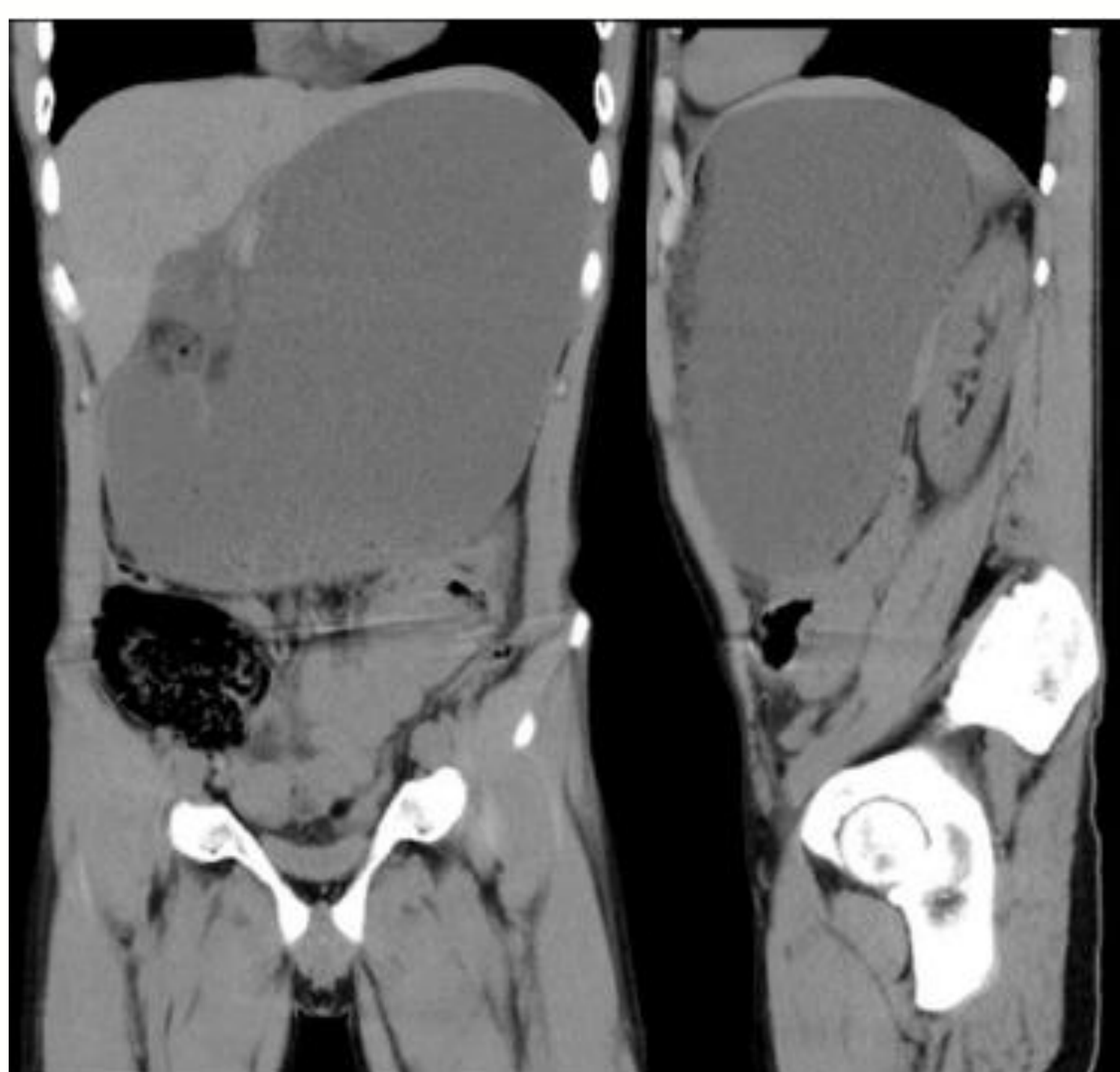


Figure 2. Abdominal CT (Coronal, Sagittal, Axial Sections) showing grossly distended stomach, distended duodenum till its third part, and abrupt narrowing in the third part of the duodenum between the superior mesenteric artery (SMA) and abdominal aorta (Red arrow).

An emergency laparotomy was performed, revealing massive gastric perforation with necrosis. (Figure 3, 4) A partial gastrectomy, gastrojejunostomy, and jejunojunctionostomy were performed. Postoperatively, the patient had spikes of fever and developed bilateral pleural effusion (Figure 5), requiring Intensive Care Unit (ICU) care, mechanical ventilation, and broad-spectrum antibiotics. Despite temporary clinical improvement, he developed right-sided pneumothorax (Figure 6) and worsening respiratory distress, necessitating intercostal drainage and oxygen therapy. Due to persistent pleural effusions, he was transferred to a specialized center for advanced pulmonary care.

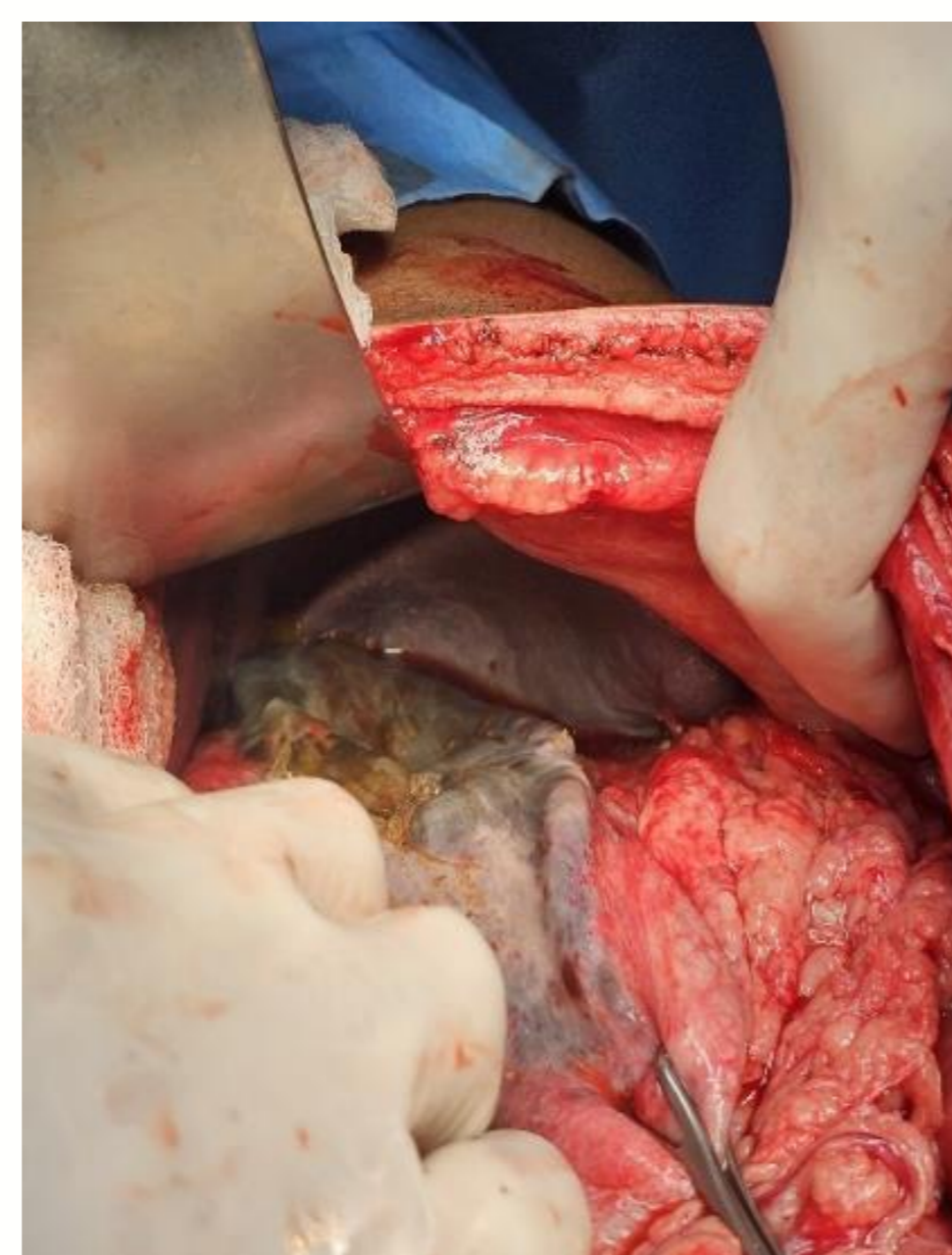


Figure 3. Intraoperative picture of the necrotic stomach wall

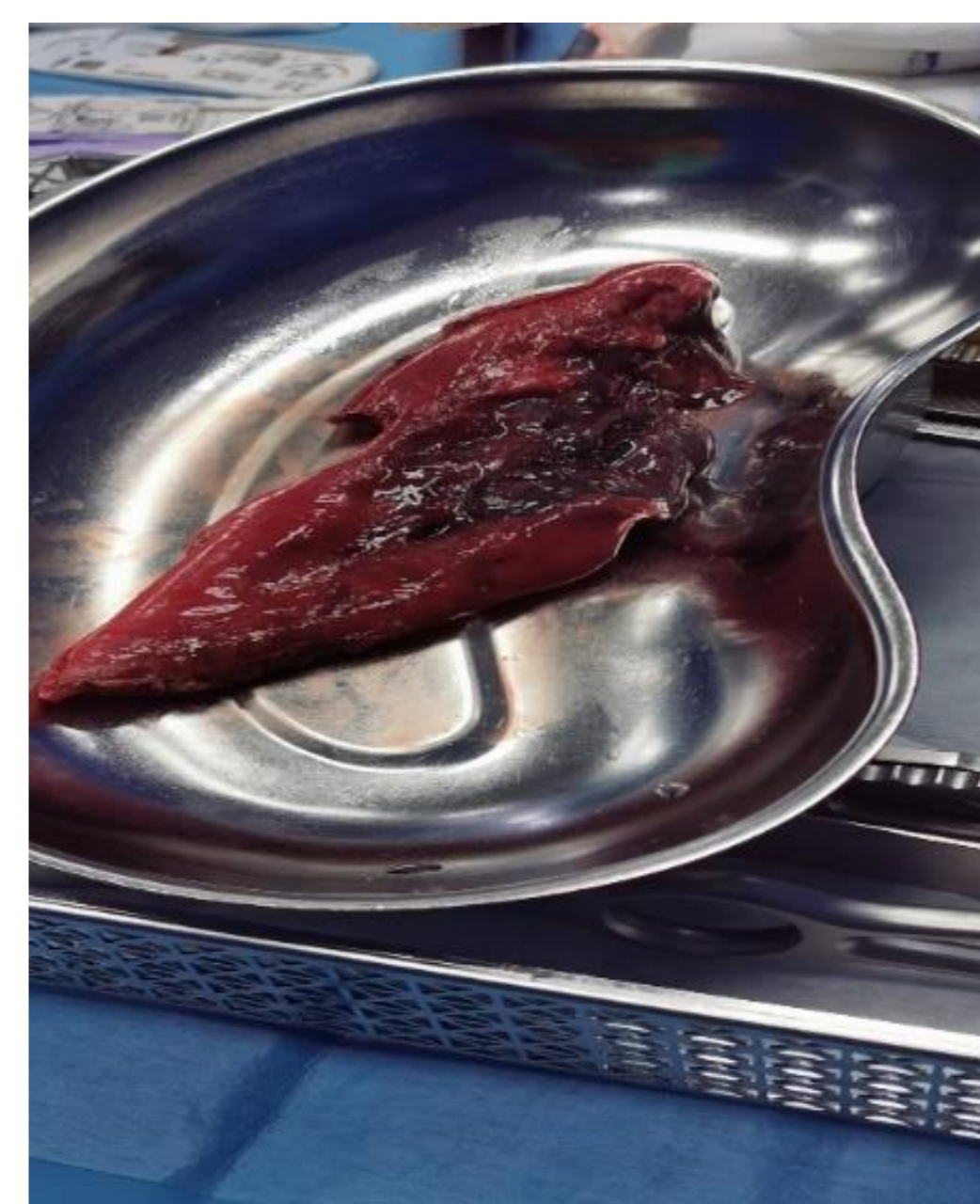


Figure 4. Excised necrotic wall of the stomach

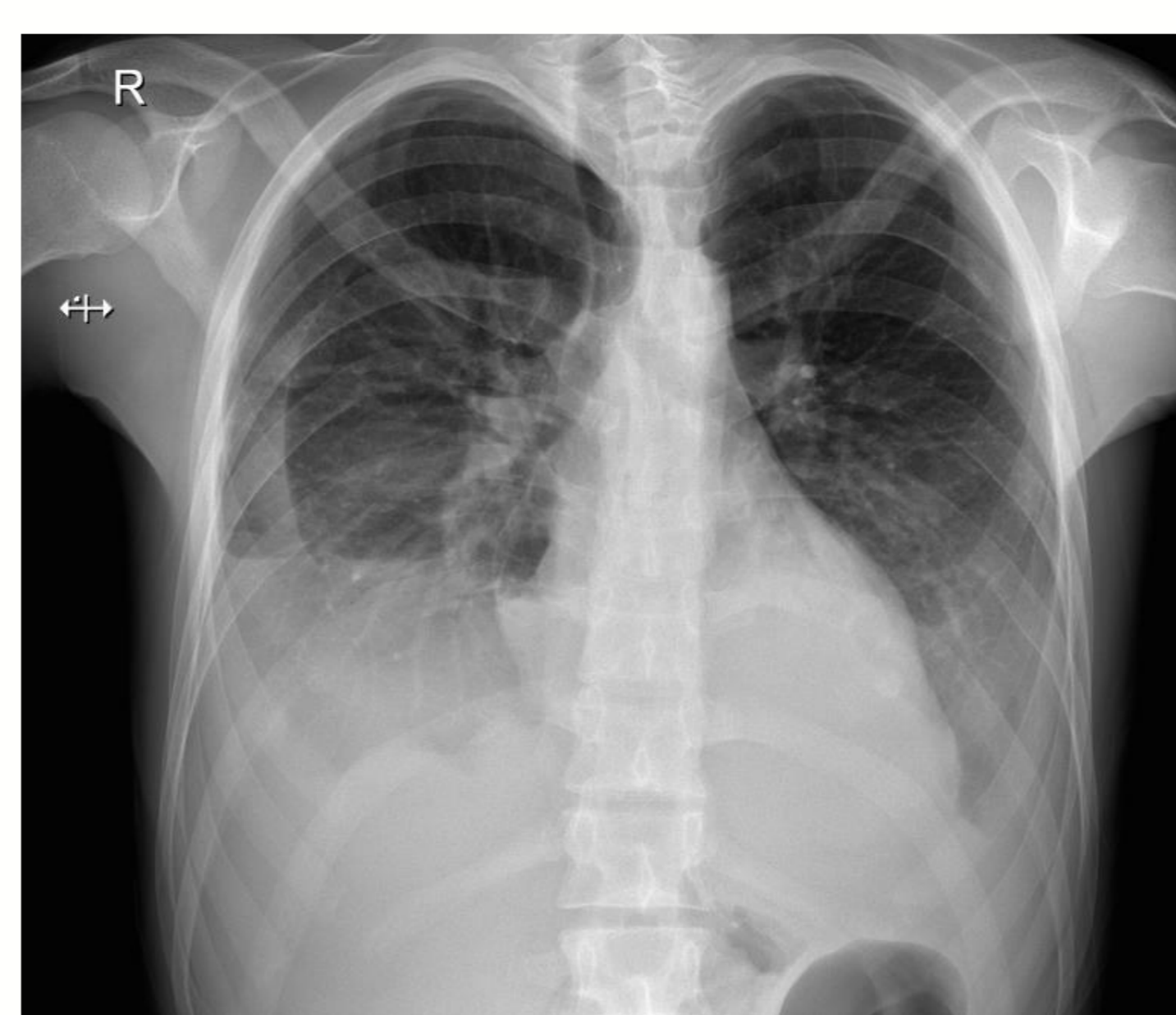


Figure 5. Chest x-ray showing bilateral pleural effusion.

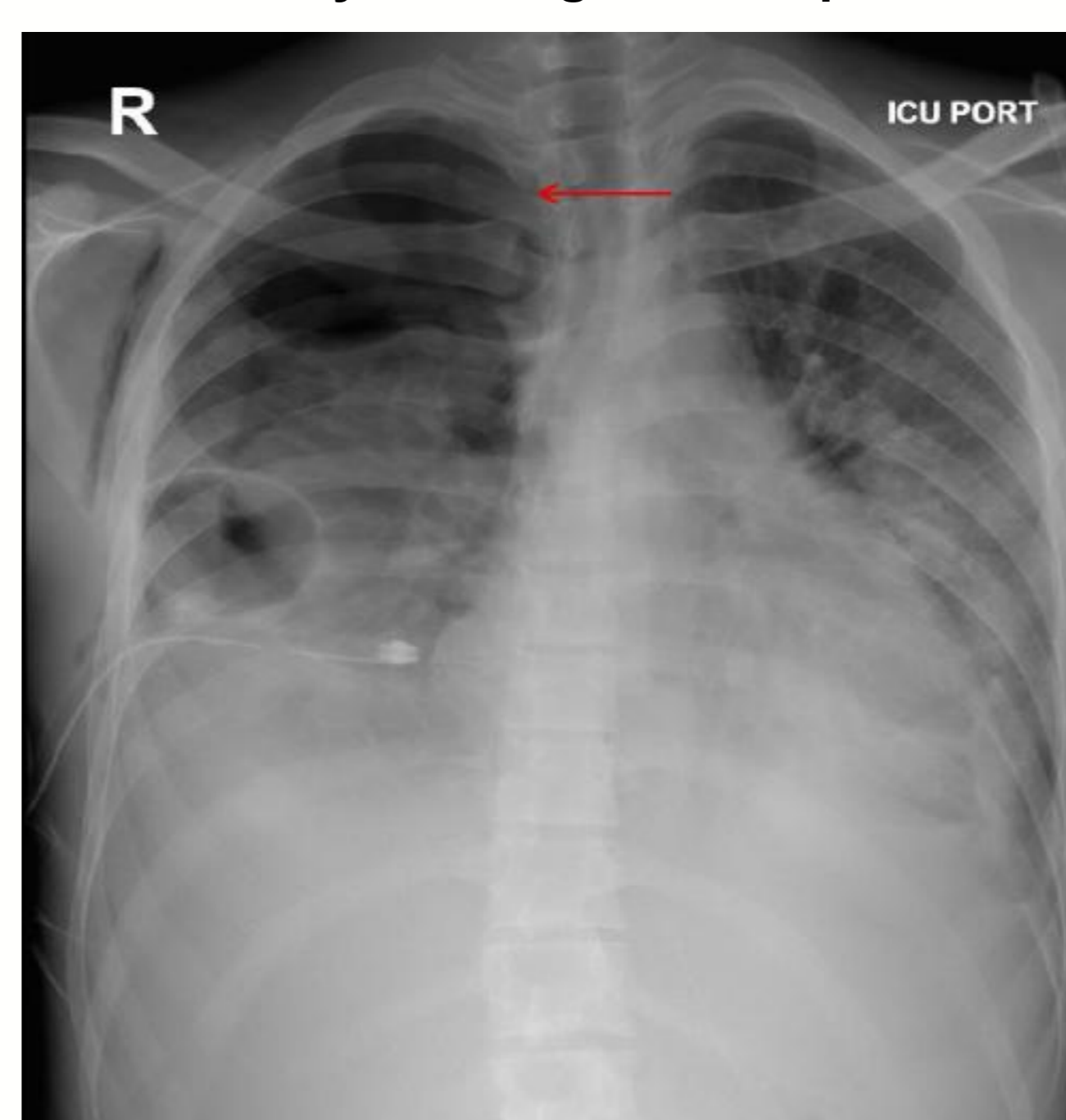


Figure 6. Chest X-Ray. Right-sided pneumothorax (Red arrow)

DISCUSSION

Wilkie's syndrome, also known as superior mesenteric artery (SMA) syndrome, is a rare vascular compression syndrome caused by the superior mesenteric artery pressing against the third portion of the duodenum [1]. It has an incidence of 0.1 – 0.3 percent. Most commonly, it occurs between the ages of 10 and 39 years old, with a female predominance [2-3]. SMA has been linked to excessive weight loss, eating disorders, malabsorption, gastric bypass surgery, trauma, malignancies, and inflammatory bowel disease [4]. The symptoms of SMA syndrome are vague and nonspecific; it includes abdominal pain, nausea, vomiting, bloating, early satiety and postprandial discomfort, and weight loss [4]. The severity of SMA syndrome's complications ranges from mild digestive problems to life-threatening disorders. However, gastrointestinal issues are the most common and occur in around 25 to 59 percent of cases [5,6]. Severe cases of SMA can be complicated by hypovolemic shock, arrhythmias due to severe hypokalemia, aspiration pneumonia, or even sudden death [7]. The normal distance between SMA and the Aorta is 10 to 33 mm, and the SMA-Ao angle is between 38 to 65 degrees [4]. Many cases were diagnosed using various radiological modalities, one of which is the CT scan, highlighting its ability to detect changes in both the distance and angle between the SMA and the aorta. According to Unal et al., the threshold values are 22 degrees for the SMA-Ao angle and 8 mm for the distance, with a sensitivity of 42.8% and a specificity of 100%, making the CT scan the investigation of choice for SMA-Ao angle measurement [8,4]. The primary goal of treating SMA syndrome is to alleviate symptoms of obstruction and prevent the complications mentioned above. Initially, the treatment is conservative and may include the insertion of a nasogastric tube, correction of fluid electrolyte imbalance, mobilization of the patient to a prone or left lateral decubitus position, and administration of parenteral nutrition [9]. The surgical option should be considered when symptoms persist after 2-12 days despite conservative treatment [10]. Surgery should also be considered if there is massive gastric or duodenal dilation to avoid atony of the mucosa when conservative treatment fails [11]. When perforation is evident, surgery becomes the treatment of choice to avoid further deterioration [11].

CONCLUSIONS

This case report highlights the challenges in managing gastric perforation secondary to a delayed diagnosis of SMA. Due to the nonspecific presentation and low prevalence of SMA, diagnosis is challenging to establish, and any delay in either diagnosis or treatment can lead to disastrous complications and life-threatening conditions.

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