

Case Report

Simultaneous idiopathic segmental infarction of the great omentum with spontaneous splenic rupture: a rare association

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Abstract: Idiopathic segmental infarction of the greater omentum (ISIGO) is a rare cause of acute abdomen. One of the main symptoms is right-side abdominal pain, while its etiology is still unclear. Until now, ISIGO simultaneously with spontaneous splenic rupture (SSR) has not been reported. Here, we presented a case of a 35-year old man, who was admitted with an acute abdomen, and the clinical diagnosis was ISIGO with SSR. He had a significant previous medical history of the vein thrombosis of lower limbs. Partial omental resection and splenectomy were performed, and the postoperative recovery of the patient was excellent. We also highlighted several possible theories to explain the etiology of the ISIGO, and emphasized that surgical methods, including laparoscopic surgery and laparotomy, are still the best way to treat the ISIGO at the emergency condition.

Keywords: Idiopathic segmental infarction of the greater omentum, spontaneous splenic rupture, emergency

Introduction

Idiopathic segmental infarction of the greater omentum (ISIGO) was firstly described by Bush in 1896 [1]. The incidence of omental infarction is about 0.1% in the laparotomies performed for the acute abdomen [2], so it is a rare entity. ISIGO associated with spontaneous splenic rupture (SSR) is far more uncommon. Here, we presented a patient who was admitted with an acute abdomen and had a significant previous medical history of the vein thrombosis of lower limbs, which may make a difference to explain the potential etiology for ISIGO. Our purpose of describing this case is to highlight some of the possible theories to explain the etiology of the ISIGO, even though it is unclear. At the condition of emergency, our experiences of this patient indicated that the preoperative diagnosis of CT and the surgery for treatment of ISIGO were mostly identical, which could help surgeons manage patients with ISIGO in future.

The case, a 35-year-old male, was admitted to our hospital on June 13, 2014, complaining of

pain in right upper quadrant of his abdomen without external blowing. The onset of his symptoms was "sour regurgitation and indigestion" about half a month ago. Afterwards, he experienced epigastric distress, which gradually became quite painful. No nausea, vomiting or changes in bowel habit were observed. The putative relevant previous medical history was his vein thrombosis of lower limbs, which had been cured in 1994.

Physical examinations revealed the abnormal blood pressure: 89/65 mmHg (1 mmHg = 0.133 kPa) all of sudden. The patient had abdominal distension, without fever, abdominal muscle guarding defense or rebound tenderness abdomen. The shifting dullness was positive. Laboratory studies showed a white blood count of $1.933 \times 10^9/L$ and the hemoglobin of 97 g/L. The blood coagulogram was normal. The results of ultrasonography of the abdomen showed lots of hemoperitoneum. CT scan demonstrated an area of slightly hyper-attenuating fat with hyper-dense infiltrated streaks, which was located in the right flank region (**Figure 1A**).



Figure 1. CT scan of the abdomen showing the characteristic features of the greater omentum infraction (A) and hemoperitoneum (B).

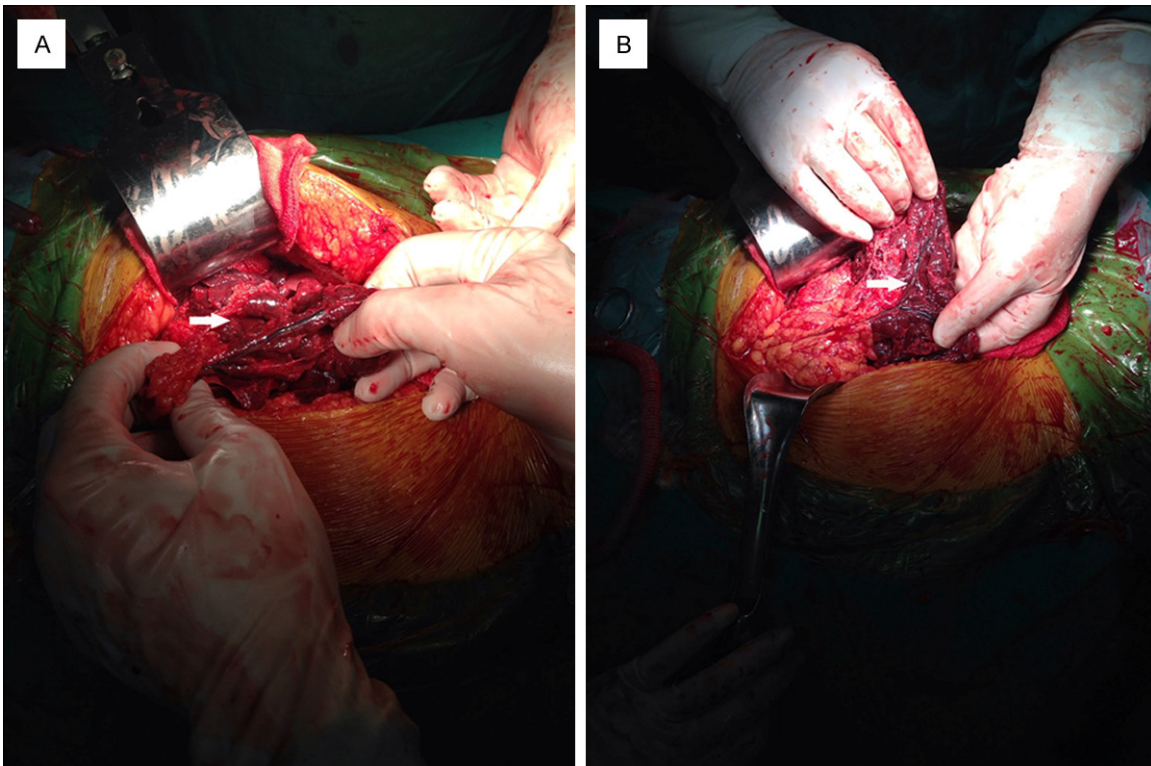


Figure 2. The view of the necrotic parts of the greater omentum.

Hemoperitoneum was also observed around the liver and spleen (**Figure 1B**).

Operation was performed through an upper-medial incision, in order to allow a good exami-

nation of the abdomen. After opening the abdominal cavity, about 2500 ml of incompressible blood and some blood clots were collected, and the total of bleeding in abdominal cavity was estimated as 3500 ml. The right lower por-

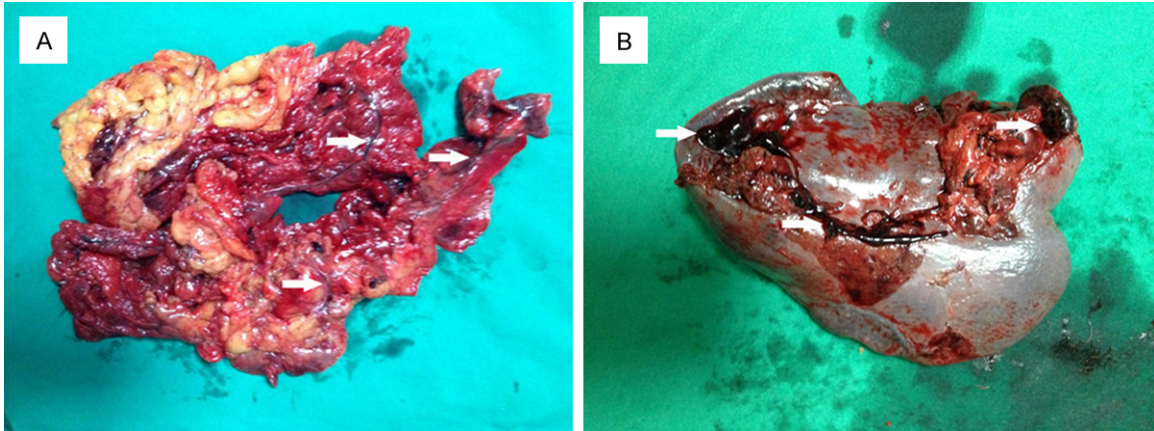


Figure 3. The view of surgical specimens (the greater omentum and spleen).

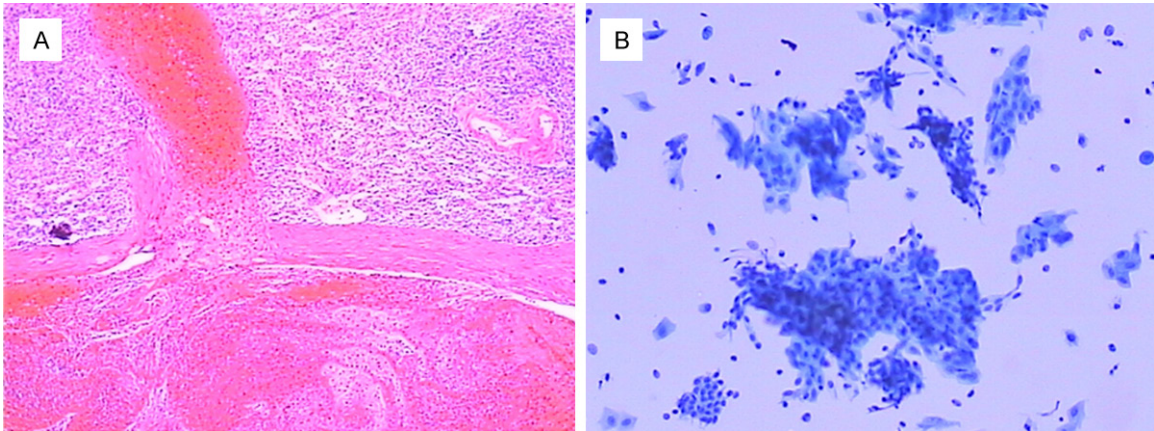


Figure 4. Chronic congestive spleen associated with thrombosis was confirmed under the microscope (A), and the panniculitis associated with hemorrhage of the greater omentum (B).

tion of the greater omentum was grossly dark red and thickened (**Figure 2A**) with vascular thrombosis in the necrosis greater omentum (**Figure 2B**). Further exploration verified SSR without torsion of the greater omentum. Therefore, partial omental resection and splenectomy were performed.

The omentum contained scattered hemorrhages and the vessels were markedly distended with thrombosis in naked eye (**Figure 3A**). The spleen size was about 15 cm × 10 cm × 4 cm, and the spleen capsule was damaged with the blood clot forming in spleen veins (**Figure 3B**). The diagnosis of omental infarction and chronic congestive spleen associated with thrombosis was confirmed under the microscope (**Figure 4A**), and our postoperative histological examinations also revealed the panniculitis associat-

ed with hemorrhage of the greater omentum (**Figure 4B**).

Discussion

ISIGO is an infrequent entity and its presentation together with SSR is rarer. To our knowledge, this is the first case. The exact etiology and pathogenesis of ISIGO with SSR is still unknown so far. As early as 1940, an animal experiment in rabbits was performed by Rabinovitch et al., and their results showed that a forceful pull on the jugular vein was sufficient to injure the intima, with a resultant clot formation at the site of injury [3]. In view of the striking resemblance in our case with thrombus in infarcted omentum, we speculated that the mechanism is somewhat same. A possible stretching of an omental vein by the gravity of the great omentum might cause some trauma

in venous intima, which led to thrombus formation. In 1987, Tolenaar et al showed that venous engorgement after heavy meals or venous elongation produced by excessive weight of the greater omentum could make the microscopic venous injury, which might lead to thrombosis in the microscopic venous and bring out ISIGO [4]. Hypertrophy omentum is easily pulled down by its own gravity and prone to forming thrombosis through vein injury. Fat men were more vulnerable to ISIGO. Coincidentally, our presented patient was also obese.

Another potential etiology of ISIGO was the congenital malformation of omental veins. In 2002, Sanchez et al. demonstrated that congenitally anomalous fragile blood supply to the right lower portion of the greater omentum made this region prone to infarct [5]. In our case, the location of the greater omentum necrosis was also the right lower portion, which suggested that the congenital factor might be one of the utmost importance.

Though we did not understand why splenic vein thrombosis occurred combined with ISIGO, in our case, we speculated that splenic vein thrombosis was secondary to hemodynamic changes after the great omental infarction. Splenic vein thrombosis resulted in the enlarged congestion of spleen and made capsule of spleen be thinner more fragile. These changes led to the formation of pathological spleen, and then a slight stretch of the ligaments around the spleen by the greater omentum made the subcapsular rupture of spleen. With the increased bleeding, the true rupture of spleen occurred eventually.

It is very difficult to get an early diagnosis of ISIGO because of no specific symptoms. Ultrasonography is also relatively difficult to help the diagnosis. In our case, the CT value of a mass was -67.6 HU at the edge of the liver, which was close to but different from that of the normal omental adipose tissue CT value -71.2 HU (**Figure 1A**). So omental infarction can be easily differentiated from the normal great omental adipose, as well as acute appendicitis and cholecystitis [6], which means that CT examination may help us predict the ISIGO and exclude some other conditions which presented a similar clinical picture.

When facing to the ISIGO, Barbier et al presented a case who was cured by conservative treat-

ment in 1998 [7]. However, one patient with ISIGO was treated by laparoscopic surgery by Roberta et al. in 2008. With a deeper understanding of ISIGO, we conclude that the surgical methods, including laparoscopic surgery and laparotomy, are still the best way to treat ISIGO at the emergency condition [8], even with SSR in our present case. In our case, partial omental resection and splenectomy were performed, and the postoperative recovery of this patient was excellent, which finally confirmed the effectiveness of surgical interventions.

Disclosure of conflict of interest

None.

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