

## Superior Mesenteric Artery Syndrome Due to an Aortic Aneurysm in a Renal Transplant Recipient

Superior mesenteric artery (SMA) syndrome is a rare disease in which the third portion of the duodenum is compressed by SMA. There are many causes leading to the SMA syndrome, however it's extremely rare that aortic aneurysm causes a SMA syndrome. We report a case of a successfully treated SMA syndrome due to an abdominal aortic aneurysm in a renal transplant recipient. The patient was a 52-yr-old woman with a thin stature (weight 40 kg, height 164 cm). She received a renal transplant 8 yr before, and had hypertension and abdominal aortic aneurysm. Her SMA syndrome developed in a prolonged supine position for the accidental rib fractures and was diagnosed by clinical and radiological findings. After a surgical correction (resection of an aneurysm and aortobiiliac bypass with an inverted Y graft), her symptoms relieved without deterioration of the graft function.

**Key Words :** Superior Mesenteric Artery Syndrome; Aortic Aneurysm; Kidney Transplantation; Hypertension

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### INTRODUCTION

Superior mesenteric artery (SMA) syndrome was first described by Rokitsansky in 1861, and has been called as arteriomesenteric duodenal compression, vascular compression of the duodenum, or Wilkie's syndrome (1, 2). This syndrome results from the compression of the third portion of the duodenum by SMA, which takes its origin from the abdominal aorta at the level of the first lumbar vertebra and crosses the duodenum (3).

The syndrome can occur when the aortomesenteric angle diminishes to 6-16 degrees (2), and is usually associated with severe wasting diseases (malignancies and burns) and a prolonged bed rest. Anorexia nervosa, malabsorption, use of a body cast, anatomical anomalies, and surgical complications are sometimes reported as the causes of the SMA syndrome (2, 4, 5).

The aortic aneurysm is a rare cause of the SMA syndrome with a limited number of reported cases (2, 3, 6-8). We here report a case of the SMA syndrome caused by an abdominal aortic aneurysm, which was successfully treated with a surgical correction, in a renal transplant recipient.

### CASE REPORT

A 52-yr-old woman was admitted to our hospital due to

left lower costal pain after falling off the steps. She had received a renal transplant 8 yr before, and her clinical course was uneventful during the follow-up period except hypertension and incidentally detected abdominal aortic aneurysm 4 yr after the transplantation. At that time, she refused to have an operation for the aneurysm.

Physical examination revealed a thin stature with a body weight of 40 kg and height of 164 cm. Her blood pressure was 160/90 mmHg. Laboratory data including renal function test on admission were unremarkable. Radiological findings revealed multiple rib fractures.

She was treated conservatively with analgesics and bed rest in supine position. During the 5 days after admission, she lost 6 kg due to poor oral intake. All of a sudden, she developed vomiting, epigastric pain, and abdominal distension on the 5th hospital day. The abdominal radiography revealed marked dilatation of the stomach, and the serum amylase level was 1,130 U/L.

Under the impression of acute pancreatitis, abdominal computed tomography (CT) scan was performed. A 4 cm-sized abdominal aortic aneurysm filled with thrombus was detected. In addition, a marked distension of the stomach, the proximal duodenum compressing the pancreas, and an abrupt cut-off on the third portion of the duodenum were observed. These findings suggested a SMA syndrome caused by the enlarged abdominal aortic aneurysm (Fig. 1).

The diagnosis of SMA syndrome was confirmed by an



Fig. 1. Abdominal CT scan shows a 4 cm-sized abdominal aortic aneurysm filled with thrombus, marked distension of the stomach, and the proximal duodenum compressing the pancreas, and the superior mesenteric artery compressing the third portion of the duodenum.



Fig. 2. Upper GI series shows an extrinsic compression of the third portion of the duodenum and marked delay in the passage of contrast material of the stomach through the duodenal loop.

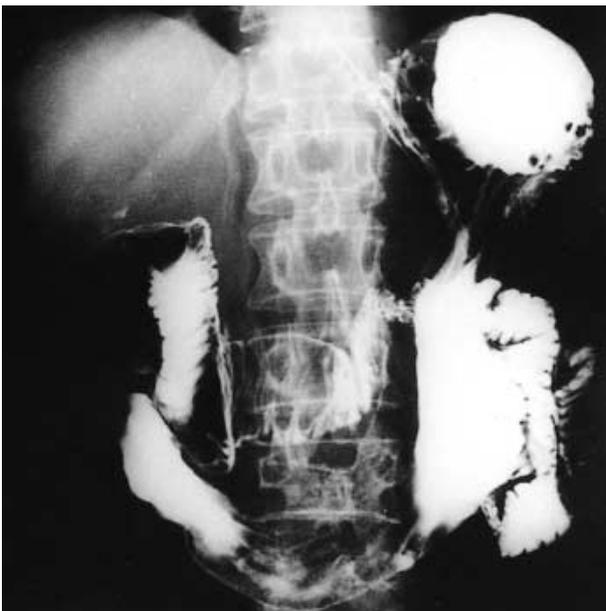


Fig. 3. Follow-up hypotonic duodenography shows no passage disturbance through the duodenal loop.

upper gastrointestinal (UGI) series, which showed an extrinsic compression of the third portion of the duodenum and marked delay in the passage of contrast material of the stomach through the duodenal loop (Fig. 2).

Treatment consisted of a gastric decompression by nasogastric tube, intravenous nutritional support, and placing

her in a prone or left lateral decubitus position. However, her symptoms did not improve. On the 15th day, an operation was performed. There was a 4 × 6 cm-sized aortic aneurysm filled with atheroma and thrombus below the origin of the left renal artery and the third portion of the duodenum was compressed between the enlarged aortic aneurysm and superior mesenteric artery. Resection of an aneurysm and aortobiliac bypass with an inverted Y Dacron graft was performed.

After surgery, her clinical symptoms improved, and there was no passage disturbance through the duodenal loop in the follow-up hypotonic duodenography (Fig. 3).

## DISCUSSION

Our case was the SMA syndrome caused by an abdominal aortic aneurysm in a renal transplant recipient. The retrospective review of this case suggested that the primary factor for the development of SMA syndrome was the pre-existing aortic aneurysm with atherosclerosis and hypertension, and the aggravating factor was the prolonged bed rest in a supine position and profound weight loss (6 kg) in a thin stature.

The suspicion of an SMA syndrome is usually based on clinical manifestations. In general, patients with an SMA syndrome present with acute or chronic postprandial epigastric pain and bilious vomiting (6). Typically, the symptoms are influenced by body position. The left lateral decubitus, prone, or knee-chest position can relieve the symptoms, while the

supine position aggravates them (2). Our patient had rib fractures, which made her on a bed rest in a supine position to relieve chest pain and prevent complications. This aggravated the compression of the duodenum by aortic aneurysm, which was manifested by a sudden onset of vomiting, epigastric pain, and abdominal distension.

The confirmation of the diagnosis of a SMA syndrome requires radiologic studies such as UGI series, hypotonic duodenography, computed tomography, and abdominal angiography (5). In this case, the upper GI series demonstrated the passage disturbance from the stomach and proximal portion of duodenum to the third portion of the duodenum. Furthermore, the abdominal CT scan showed an enlarged aortic aneurysm compressing the third portion of the duodenum. Taken together, we diagnosed this case as a SMA syndrome related to the enlarged aortic aneurysm.

The treatment of SMA syndrome consists of a conservative and/or surgical treatment. The conservative treatment is to correct or remove the precipitating factors, and the surgical treatment is necessary when the conservative care fails (2, 5). Many surgical methods including gastrojejunostomy, duodenojejunostomy, and Strong's operation have been practiced and the choice of the surgical method is dependent upon the clinical situations. In this case, the surgical approach was focused on the correction of abdominal aneurysm (resection of an aneurysm and aortobiliac bypass with an inverted Y Dacron graft), and the symptoms from SMA syndrome improved without deteriorating the graft function.

The two most common pathologic conditions associated with aortic aneurysm are atherosclerosis and hypertension, which are usually observed in a renal transplant recipient. Therefore, clinicians should pay attention to such a possible complication of aortic aneurysm in a renal transplant recipient with hypertension.

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