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CASE REPORT

Superior Mesenteric Artery Syndrome Caused by Massive Lumbar Osteophytes

A Case Report

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Study Design. Case report.

Objective. To present a rare case of superior mesenteric artery (SMA) syndrome caused by massive lumbar osteophytes.

Summary of Background Data. SMA syndrome is a relatively rare condition thought to be secondary to functional obstruction. Although several risk factors for SMA syndrome have been reported, no other previous reports have suggested that lumbar osteophytes caused SMA syndrome.

Methods. A rare case of SMA syndrome caused by massive lumbar osteophytes was treated by resecting the osteophytes.

Results. An 82-year-old man, with a history of polysurgery, presented with frequent vomiting. He was diagnosed with SMA syndrome after endoscopic and several radiological examinations, and was successfully treated by the resection of the osteophytes.

Conclusion. To the best of our knowledge, a case of SMA syndrome secondary to lumbar osteophytes has not been reported in the literature. The possibility of SMA syndrome caused by massive lumbar osteophytes should be taken into consideration when the cause of SMA syndrome is unknown. In addition, the resection of osteophytes could be a less invasive treatment in such cases.

Key words: superior mesenteric artery (SMA) syndrome, intestinal obstruction, lumbar osteophyte, surgical resection, less invasive surgery.

Level of Evidence: 5

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Superior mesenteric artery (SMA) syndrome, a rare disorder, was first described by Rokitansky in 1842.[1] Acute angulation of SMA causes compression of the third segment of the duodenum between the SMA and aorta, leading to obstruction, nausea, vomiting, and weight loss.[2] The occurrence of the SMA syndrome has been associated with numerous predisposing conditions, including chronic wasting disease, trauma, dietary disorders, postoperative states, and anatomy and congenital anomalies.[2] Herein, we describe a rare case of SMA syndrome secondary to lumbar osteophytes treated successfully by resecting the osteophytes.

CASE REPORT

An 82-year-old male, with a history of polysurgery, presented with frequent vomiting. He underwent total gastrectomy for gastric cancer with a reconstruction of a jejunum interposition, posterior decompression for lumbar spinal canal stenosis, descending colectomy for descending colon cancer, and cholecystectomy at 66, 74, 75, and 79 years of age, respectively. He referred a weight loss of approximately 5 kg in the previous 2 months, resulting in a weight of 37.5 kg. He was managed conservatively for 2 months with total parenteral nutrition, however, there was no symptomatic improvement. An abdominal radiograph showed marked distention of the interposed jejunum (Figure 1A). A computed tomography (CT) scan revealed large lumbar anterior osteophytes at L3/4 and L4/5, which displaced the aorta anteriorly (Figure 1B, C). Gastrografin administration showed accumulation of contrast in the third part of duodenum, with proximal dilation and slow passage into the distal small bowel under manual compression (Figure 1D). An esophagogastroduodenoscopy (EGD) indicated the presence of an external obstruction at the center of the distal third of the duodenum (Figure 1E). Therefore, we diagnosed SMA syndrome secondary to massive lumbar osteophytes, which displaced the aorta anteriorly. Gastrojejunostomy or duodenojejunostomy is traditionally recommended after failure of conservative management for SMA syndrome.[3] However, he had undergone polysurgery, and these treatment strategies appeared inappropriate. Thus, by resecting the lumbar osteophytes, we expanded

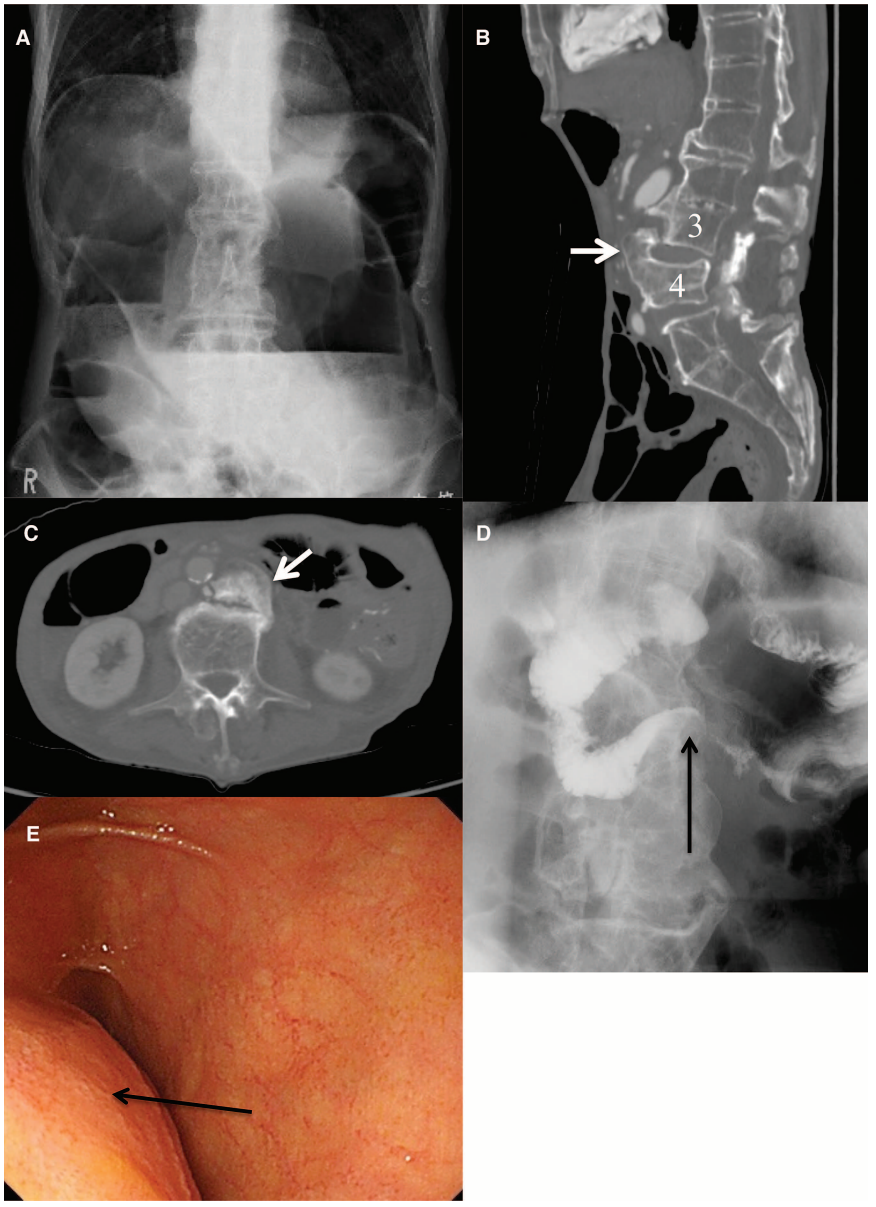

Figure 1. A, Abdominal radiograph showing marked distention of the interposed jejunum. **B**, **C**, A computed tomography scan showed large anterior osteophytes at L3/4 and L4/5, displacing the aorta anteriorly. Numbers 3 and 4 indicate the levels of the lumbar spine. Arrows indicate the osteophytes. **D**, Gastrografin administration showed the accumulation of contrast in the third part of duodenum with proximal dilation and slow passage into the distal small bowel. The arrow indicates the narrowed area. **E**, Esophagogastroduodenoscopy showed the external obstruction at the center of a third part of the duodenum. Arrow showing elevated duodenum from the outside.

the aortomesenteric distance and achieved symptomatic improvement.

Under general anesthesia and in the right lateral decubitus position, we performed a skin incision downward and obliquely between the costa and ilium. We dissected the atrophic external and internal oblique muscles and transverse abdominal muscle to access the retroperitoneum space, followed by careful exposure of the lumbar vertebral body from the periosteum (Figure 2A). The aorta was migrated anteriorly by the massive anterior osteophytes at L3/4 and L4/5 by approximately 3 cm. Under aorta protection, total *en bloc* resection of the massive anterior osteophytes of L3/4 and L4/5 was carefully performed using chisels (Figure 2B). The size of the resected spur was 10 cm × 3 cm × 5 cm. The surgical time was 188 minutes, and blood loss was 190 mL. An immediate, postoperative gastrografin study showed smooth passage through the preoperatively narrowed area (Figure 2C). Postoperative CT scan showed no residual osteophytes and normal location of the aorta (Figure 2D). A 3-dimensionally (3D), reconstructed CT scan confirmed the expansion of the aortomesenteric distance postoperatively (Figure 3). Postoperative oral intake was gradually achieved, and body weight increased from 37.5 to 48.4 kg in 6 months.

DISCUSSION

An aortomesentric angle of less than 22°–25° and a distance of less than 8 mm correlated well with symptoms of SMA syndrome.[4,5] In our case, the aortomesenteric angle distance were 38° and 12 mm, respectively; however, the lumbar osteophytes displaced the aorta anteriorly and reduced the aortomesenteric distance by 2 mm at the periphery. SMA syndrome is a well-known complication following scoliosis surgery because of the relative postoperative lengthening of the spine.[6–8]

SMA syndrome has been previously reported in patients with abdominal aortic aneurysms.[9] A case of a giant anterior

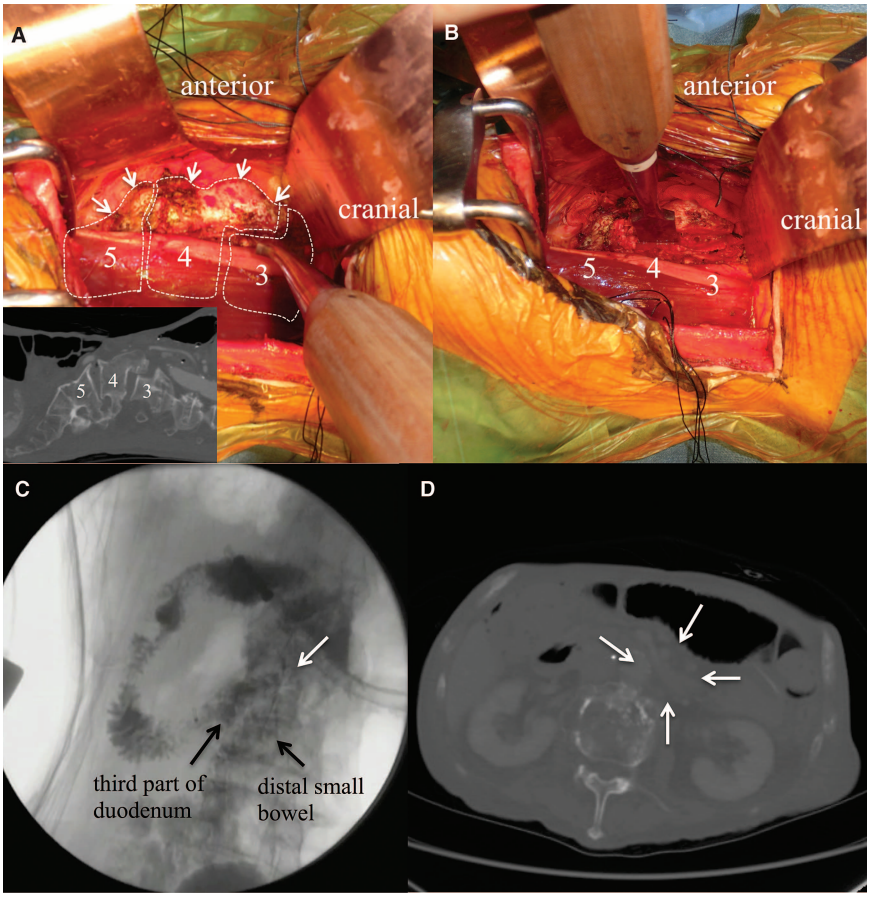

Figure 2. A, **B**, Intraoperative findings before resection of lumbar osteophytes (**A**) and after resection of lumbar osteophytes (**B**) **A**, Numbers 3, 4, and 5 with white dashed lines indicate the shapes of each vertebral body (L3–5). Arrows indicate the osteophytes. Inset reveals the sagittal CT image of the same site. **C**, A gastrografin study via a nasoileum tube showing smooth passage over the preoperative narrowed area. The white arrow shows the narrowed area. **D**, Postoperative computed tomography scan showed no residual osteophytes. The arrows show the absence of residual osteophytes.

cervical osteophyte leading to dysphagia with lateral displacement of the esophagus was also reported.[10] The clinical manifestations of SMA syndrome in our case are similar to these previous cases. In our case, we found diffuse idiopathic skeletal hyperostosis from upper thoracic spine to L3, which were fused and immobile. In contrast, mobile segments were only observed at L3/4 and L4/5. We hypothesize that the development of the huge osteophyte was possibly caused by hypermobility in L3/4 and L4/5.

The SMA syndrome is usually managed conservatively.[11–13] Surgery is indicated when conservative treatment fails. Several surgical procedures, including gastrojejunostomy and duodenojejunostomy, have been performed to resolve or bypass duodenal compression,[3,14] with good postoperative outcomes.[3,15] However, these may be limited by adhesions, and there is a risk of anastomosis leakage. Lumbar osteophyte resection is advantageous, because it is still possible when adhesions impede abdominal surgery and it does not require anastomosis.

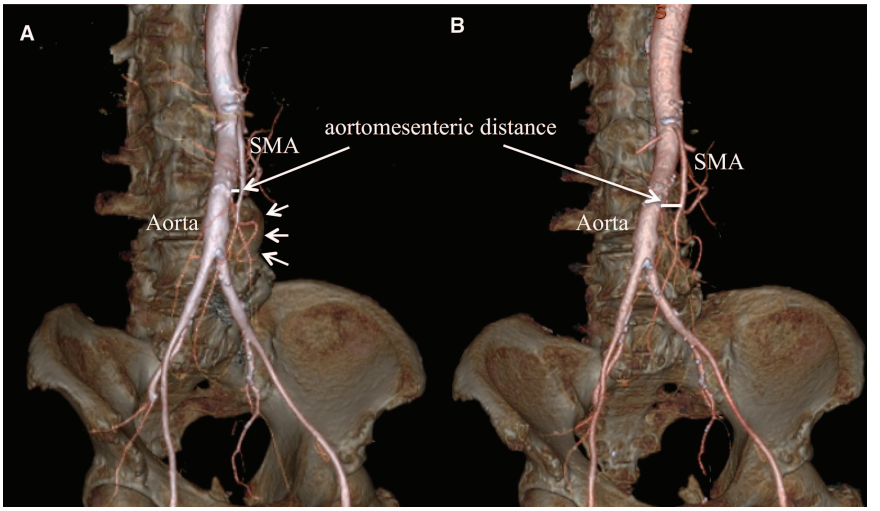

Figure 3. Preoperative (**A**) and postoperative (**B**) reconstructed 3-dimensional computed tomography scan showing the expansion of the aortomesenteric distance in the periphery. The arrows show the preoperative osteophytes. SMA, superior mesenteric artery.

➢ Key Points

- ❑ The presence of massive lumbar osteophytes is suggested as a risk factor of SMA syndrome.
- ❑ The SMA syndrome was treated successfully by resecting the osteophytes.
- ❑ Spur resection might be a less invasive treatment for SMA syndrome caused by large osteophytes, particularly in the patients with abdominal adhesions.

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