

Graft Perforation by a Spinal Bony Spur: An Unusual Cause of Late Bleeding after Thoracoabdominal Aorta Replacement

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We report an unusual case of delayed bleeding after open surgical repair of a thoracoabdominal aortic aneurysm. A 79-year-old man developed a massive retroperitoneal hematoma 49 days after Crawford type III thoracoabdominal aorta replacement. During emergency surgery, a tear was found in the prosthetic vascular graft caused by a sharp bony spur arising from the second lumbar vertebral body. This rare, but potentially lethal, complication indicates that attention should be paid to sharp bony structures during open repair of the descending aorta.

Key words: 1. Aorta, surgery
2. Hemorrhage
3. Surgery
4. Complication

Case report

A 78-year-old man underwent open surgical repair of Crawford type III thoracoabdominal aortic aneurysm because its maximal diameter increased from 49 to 60 mm during 2 years of follow-up (Fig. 1). He had no major associated illness except for chronic renal dysfunction, with a serum creatinine concentration of 2.5 mg/dL. Under general anesthesia, the thoracoabdominal aorta was replaced via a left thoracoabdominal incision through the seventh intercostal space. Left femorofemoral partial cardiopulmonary bypass was performed for distal aortic perfusion, and the visceral branches were selectively perfused at the flow rate of 100 mL/min for each branch. As the most distal segment of the thoracic aorta had not experienced aneurysmal changes, the thoracic aorta and abdominal aorta were separately replaced with 2

grafts: a 26-mm tube graft (Gelweave; Vascutek, Inchinnan, UK) for the thoracic aorta and a 26-mm 4-branch graft (Gelweave Coselli, Vascutek) for the abdominal aorta (Fig. 1). The duration of cardiopulmonary bypass was 63 minutes and the entire operation took 280 minutes.

The patient quickly regained consciousness without any neurological deficits and could be extubated at 10 hours after the operation. However, oliguric renal failure developed, necessitating continuous renal replacement therapy, which was changed to intermittent hemodialysis starting on postoperative day (POD) 6. After being transferred to the general ward on POD 7, he had to remain in the hospital because of general weakness and poor oral intake. Postoperative computed tomographic (CT) imaging, which is usually taken before POD 7 at Seoul National University Bundang Hospital, was deferred

Received: August 23, 2018, Revised: September 13, 2018, Accepted: September 13, 2018, Published online: June 5, 2019

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for fear of aggravating the patient's renal dysfunction, which could be reversible. An arteriovenous fistula for dialysis access was made at the left forearm on day 29.

On POD 49, the patient developed fever and abdominal pain. After noticing rapidly progressing abdominal distension, CT angiography was immediately performed, and revealed a large amount of retroperitoneal hematoma around the prosthetic graft. Extravasation of the contrast agent was noted (Fig.

2A). The branch graft connected to the left renal artery was not visualized. With those findings, the most probable diagnosis was considered to be dehiscence of the left renal artery graft.

The patient was directly transferred to the operating room for exploration. In contrast to our interpretation of the CT images, a 2-mm-long linear tear was found at the prosthetic graft at a location in direct contact with a sharp bony spur protruding from the second lumbar vertebral body (Fig. 3). After repairing the tear with a pledget-buttressed 4-0 polypropylene suture in a horizontal mattress manner, a retroperitoneal fat flap was interposed between the graft and the bony spur. The patient stayed in the intensive care unit for 3 more days and then remained hospitalized for 4 months. There was no fur-



Fig. 1. Three-dimensionally rendered computed tomography images: preoperative (A) and postoperative day 3 (B).

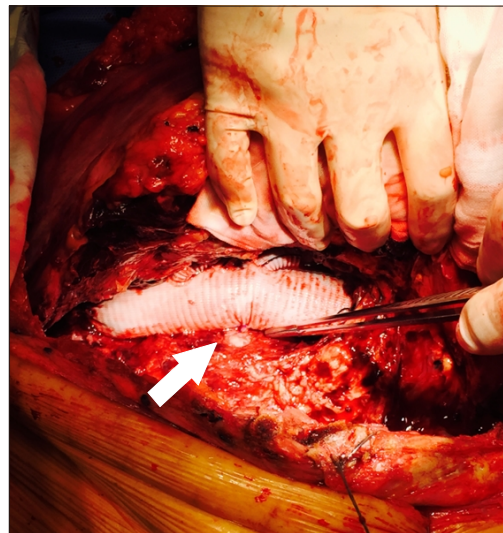


Fig. 3. Intraoperative photo showing the repaired perforation site of the aortic graft adjacent to the bony spur (arrow).

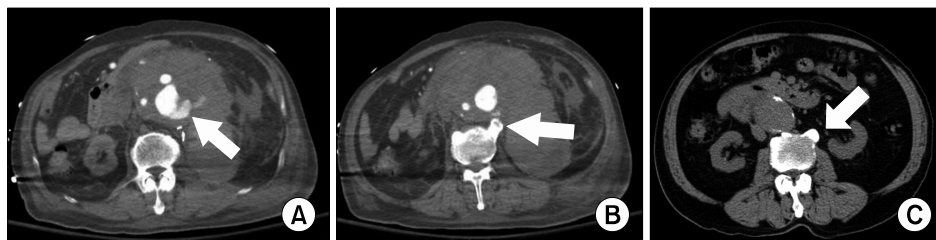


Fig. 2. Transverse axial computed tomography images showing extravasation of the contrast agent into the retroperitoneal hematoma (A, arrow) and the bony spur (osteophyte) of the lumbar vertebral body (B, arrow). (C) The osteophyte was clearly visible in the preoperative image (arrow).

ther event during 2 years of subsequent follow-up. On a retrospective review of the CT images, we confirmed the presence of the vertebral bony spur, which had not drawn any attention from the surgeons and radiologists before the second operation (Fig. 2B, C).

Informed consent was acquired from the patient.

Discussion

The most frequent causes of delayed bleeding after aortic surgery are known to be rupture of anastomotic pseudoaneurysm, graft rupture caused by infection, and aorta (graft)-enteric fistula [1]. This case reports documents a very rare complication after descending aorta replacement that was potentially lethal since it led to delayed acute bleeding.

Bony spurs, or osteophytes, are pointed or beaked osseous outgrowths that infrequently cause symptoms by compressing adjacent anatomic structures, such as nerves, vessels, bronchi, and the esophagus. There have been a few reports of vertebral osteophytes causing injury to adjacent structures, such as the nasopharynx and the heart, especially the left atrium [2-4]. Cases of abdominal aortic injury also have been reported [5,6].

Despite of the scarcity of such reports, vertebral osteophytes also pose a potential danger for prosthetic aortic grafts. Although to the best of our knowledge, this is the first case report of graft perforation by an osteophyte, it has been reported that aortic grafts can be injured by adjacent structures, such as the stump of a fractured rib and a sharp atherosclerotic plaque left alone in the aortic wall [7,8]. Along with our case, these reports imply that care should be taken to keep prosthetic aortic grafts away from direct contact with any potentially harm-

ful structures, such as stumps of fractured bones, osteophytes, calcified aortic plaques, and holes of drainage tubes.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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