

Vertebral Compression Fracture as the Complication of Embolization by Direct Puncture with Transpedicular Approach in a Patient with Type II Endoleak After Endovascular Aortic Repair

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To the Editor,

We read an interesting article written by Ogawa et al. entitled “Embolization by direct puncture with a transpedicular approach using an isocenter puncture (ISOP) method in a patient with a type-II endoleak after endovascular aortic repair (EVAR) [1].” We too performed embolization using computed tomography (CT)-guided transpedicular direct puncture for type-II endoleak after EVAR. Through this letter, we report a case of vertebral compression fracture as a complication of this treatment.

Our institutional review board did not require approval to report this study. Our patient was an 85-year-old female who underwent EVAR for an infrarenal abdominal aortic aneurysm 42 months before. Contrast-enhanced CT revealed a type-II endoleak from the median sacral artery via the lateral sacral artery and expansion of the aneurysmal sac and diffusely decreased bone density, indicating osteoporosis. Transarterial embolization (TAE) performed using the triaxial system was unsuccessful owing to tortuous arteries. We planned to perform direct puncture with the transpedicular approach because we considered it would be too difficult to access the enhanced area in the aneurysmal sac without graft perforation by the translumbar approach.

The patient was placed in the prone position and administered local anesthesia. A 13-G, 10-cm bone biopsy needle (Osteo-Site, Cook Japan, Tokyo, Japan) was

inserted into the prevertebral space via the left fourth lumbar pedicle and vertebral body under CT fluoroscopy guidance. Next, a 19-G, 20-cm needle (Hakko elaster type 1, Hakko, Nagano, Japan) was inserted through the 13-G coaxial bone biopsy needle and advanced to the aneurysmal sac with CT fluoroscopy guidance (Fig. 1). An angiogram via the 19-G needle showed the aneurysmal sac, left fourth lumbar artery, and median sacral artery. We prepared an n-butyl-2-cyanoacrylate (NBCA)–lipiodol emulsion comprising 12.5% NBCA (Histoacryl; B. Braun, Tuttlingen, Germany) and lipiodol (Lipiodol Ultra Fluid; Guerbet Japan, Tokyo, Japan) and injected it (total 4 ml) until the fourth lumbar and median sacral arteries were depicted (Fig. 2). The patient exhibited no symptoms and was discharged after three days. She came to our institution because she suffered from severe back pain and could not stand by herself nine days after her discharge. CT revealed a compression fracture in the fourth lumbar vertebra (Fig. 3). She was treated conservatively with analgesics as an outpatient.

In case of failure of the endovascular approach, embolization by direct puncture is an effective treatment for type-II endoleaks following EVAR [2, 3]. Furthermore, the transpedicular approach could be chosen for embolization by direct puncture when the translumbar and transabdominal approaches are impossible owing to the presence of stent-grafts or important organs [1]. Hematoma, graft perforation, and non-target embolization, including pulmonary embolism, are complications related to direct puncture [2, 3]. There are no reports on vertebral compression fracture after embolization by direct puncture via the transpedicular approach in patients with type-II endoleaks after EVAR. The transpedicular approach is commonly performed in percutaneous vertebroplasty

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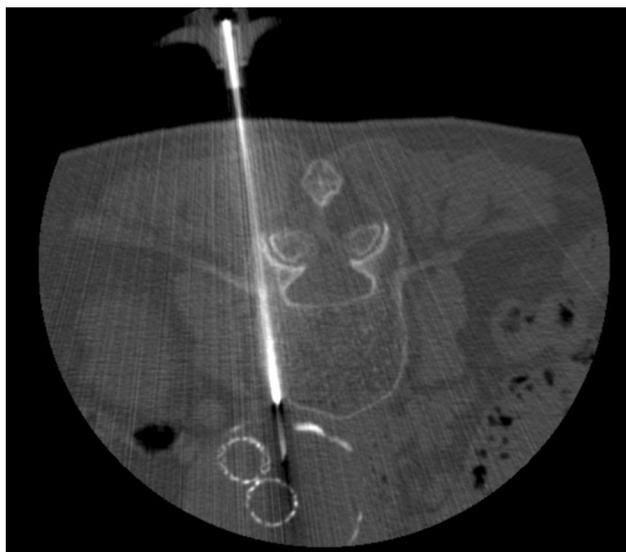


Fig. 1 Computed tomography image acquired during the procedure. A 19-G needle is advanced into the aneurysmal sac through a 13-G coaxial bone biopsy needle, which punctures the fourth lumbar vertebra. The fracture is not visible in the fourth lumbar vertebra

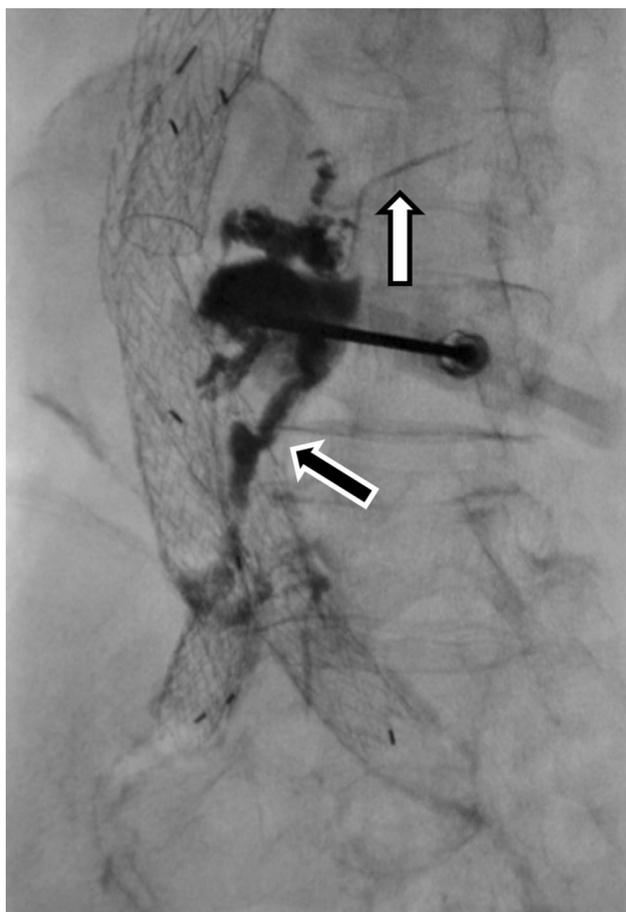


Fig. 2 Fluoroscopy during injection of the n-butyl-2-cyanoacrylate-lipiodol emulsion. The fourth lumbar artery (white arrow) and median sacral artery (black arrow) are depicted

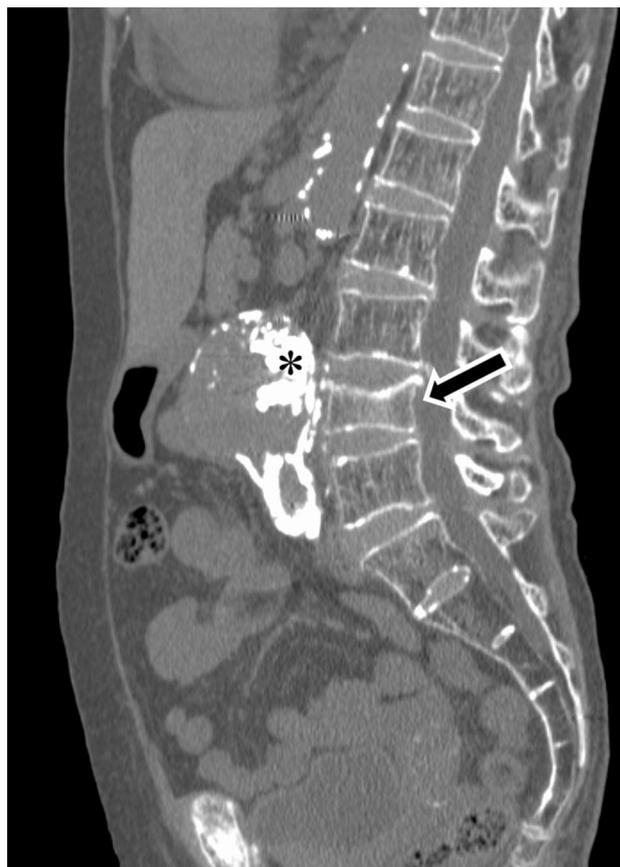


Fig. 3 Computed tomography sagittal image acquired 12 days after treatment. Computed tomography reveals shortening of the fourth lumbar vertebra (arrow). Lipiodol remains in the aneurysmal sac (asterisk)

(PVP) [4], which has complications, such as fracture of ribs or pedicle and collapse of the adjacent vertebral body. However, compression fractures of the punctured vertebral body were not documented because the target vertebral body was already fractured [4]. This case indicates that a punctured osteoporotic vertebral body is prone to compression fractures. Treatment with PVP at the time of embolization may prevent vertebral compression fracture. The transpedicular approach can be considered when transarterial embolization and direct puncture via the transabdominal and translumbar approaches are not possible; however, vertebral compression fractures should be considered, particularly in patients with osteoporosis.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Statement All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964

Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed Consent Our institutional review board did not require approval to report this case.

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