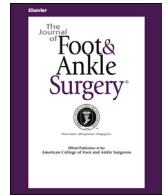




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## Case Reports and Series

Total Talar Replacement for Idiopathic Necrosis of the Talus:  
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## ABSTRACT

Idiopathic osteonecrosis of the talus is a rare but severe condition that directly affects the ability to walk and is difficult to treat either conservatively or surgically. We report the case of a 72-year-old female with idiopathic necrosis of the talus treated with total talar replacement surgery. A custom-made aluminum-ceramic total talar prosthesis was prepared using the mirror image of the computed tomography and radiographic data from the contralateral ankle. The talus was exposed and removed using an anterior approach, and the total talar prosthesis was inserted. The prosthesis was placed in a stable position between the tibia, calcaneus, and navicular, with no signs of instability with ankle joint movement. The ankle was immobilized in a short-leg cast for 3 weeks. At the latest follow-up examination, 2 years after surgery, the patient was walking without pain. Examination of the left ankle showed 20° of dorsiflexion and 40° of plantar flexion. The American Orthopaedic Foot and Ankle Society ankle/hindfoot score was 90, which had improved from a preoperative score of 45. Radiographic examination showed that the prosthesis was in a stable position in the ankle mortise, and no degenerative or destructive changes were observed in the surrounding bones. This is the first reported case of total talar replacement with a prosthesis for idiopathic talar necrosis. Although the long-term outcome is still unknown, this procedure could provide a good treatment option for idiopathic necrosis of the talus.

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Idiopathic osteonecrosis of the talus is a rare but severe condition that directly affects the ability to walk (1,2). Few treatment options are available for this condition. Conservative treatment usually requires a long non-weightbearing period, with no guarantee of a satisfactory result (2). Operative treatment options such as talocrural arthrodesis using the anterior part of the talus, which will usually be spared necrosis, and shortening arthrodesis between the tibia and calcaneus, result in loss of function (3–5). To address this issue, a talar prosthesis was developed in Japan in 1999, and several subsequent design revisions have resulted in improved outcomes after prosthesis implantation. We present the first reported case of idiopathic talar necrosis treated by implantation of a third-generation total talar prosthesis.

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## Case Report

A 72-year-old female with no comorbidities visited our clinic with a 4-month history of left ankle pain during walking. She was using crutches for mobilization. She had no history of systemic steroid use, trauma, or alcohol addiction. The physical examination revealed a tender, swollen left ankle with 0° of dorsiflexion and 20° of plantar flexion. The American Orthopaedic Foot and Ankle Society ankle/hindfoot score was 45. No swelling or tenderness of any other joints was present. The blood test results did not show any signs of infection or inflammatory conditions.

Radiographs showed collapse and sclerotic changes of the talar body, with several free calcified bodies (Fig. 1). Only slight degenerative changes of the talocrural joint were present. Magnetic resonance imaging showed extensive areas of low-signal intensity in the body and neck of the talus on the T<sub>1</sub>- and T<sub>2</sub>-weighed images, indicating aseptic necrosis (Fig. 2). No abnormalities were observed in the surrounding bones, including the tibia, calcaneus, and navicular.

We diagnosed idiopathic necrosis of the talus, and planned total talar replacement surgery. A custom-made aluminum-ceramic total



**Fig. 1.** Radiographs taken at the first visit to our clinic showing collapse and sclerotic changes of the talar body, with several free bodies, but no remarkable degenerative changes in the surrounding bones.

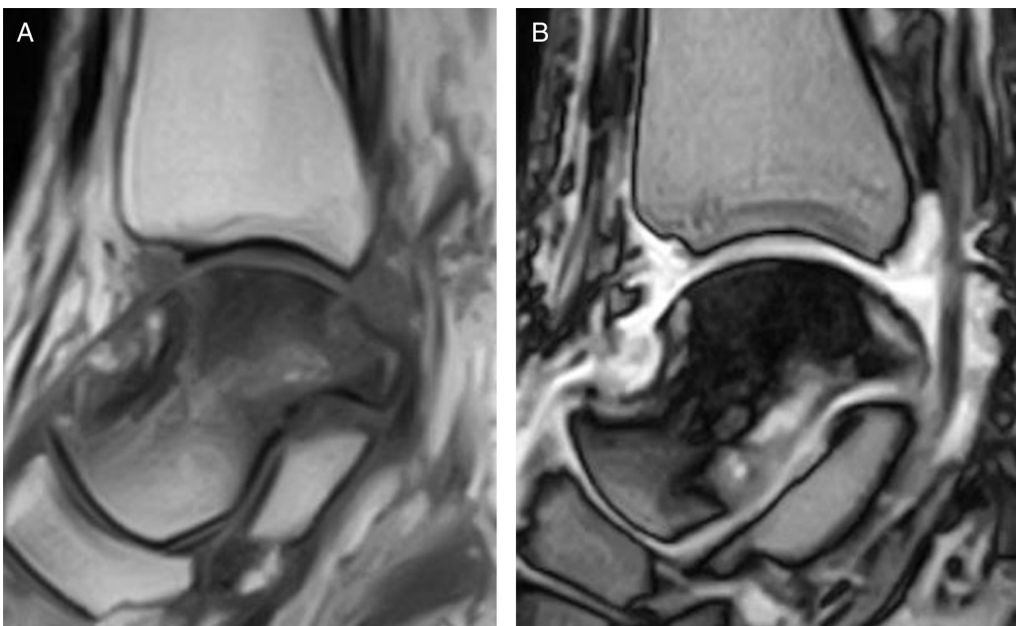
talar prosthesis was prepared by Kyocera Co., Ltd. (Kyoto, Japan) using the mirror image of the computed tomography and radiographic data from the contralateral ankle (Fig. 3).

The talus was exposed using an anterior approach between the tibialis anterior and extensor hallucis longus tendons. The soft tissues attached to the talus were dissected, and the whole talus was removed piece by piece. The calcaneofibular ligament and superficial layer of the deltoid ligament were left untouched. Large portions of the body and neck of the talus were soft and yellow, confirming necrosis. The calcaneus was retracted distally by hand, and the talar prosthesis was inserted. After confirmation that the prosthesis was in a stable position between the tibia, calcaneus, and navicular, with no sign of instability with ankle joint movement, the wound was sutured closed. No ligament reconstruction was performed. Correct

positioning of the prosthesis was confirmed by radiographic examination (Fig. 4).

The ankle was immobilized in a short-leg cast for 3 weeks. One-third partial weightbearing was allowed after 1 week and full weightbearing after 2 weeks. After 3 weeks, the patient was allowed to walk without an orthosis.

At the latest follow-up examination, 2 years after surgery, the patient was walking without pain. Examination of the left ankle showed 20° of dorsiflexion and 40° of plantar flexion. The American Orthopaedic Foot and Ankle Society ankle/hindfoot score was 90, much better than the preoperative score of 45. Radiographic examination showed that the prosthesis was in a stable position in the ankle mortise, and no degenerative or destructive changes were observed in the surrounding bones (Fig. 5).



**Fig. 2.** Magnetic resonance imaging of the talus at the first visit to our clinic showing extensive areas of low-signal intensity on both T<sub>1</sub>- and T<sub>2</sub>-weighted images, indicating extensive aseptic necrosis in the body and neck of the talus.

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