

## Reconstruction of the Midfoot Using a Free Vascularized Fibular Graft After En Bloc Excision for Giant Cell Tumor of the Tarsal Bones: A Case Report

Hitomi Hara, MD, PhD<sup>1</sup>, Teruya Kawamoto, MD, PhD<sup>1</sup>, Yasuo Onishi, MD, PhD<sup>2</sup>, Hiroyuki Fujioka, MD, PhD<sup>3</sup>, Kotaro Nishida, MD, PhD<sup>4</sup>, Ryosuke Kuroda, MD, PhD<sup>5</sup>, Masahiro Kurosaka, MD, PhD<sup>6</sup>, Toshihiro Akisue, MD, PhD<sup>7</sup>

<sup>1</sup> Research Associate, Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

<sup>2</sup> Orthopedist, Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

<sup>3</sup> Professor, Hyogo University of Health Sciences School of Rehabilitation, Kobe, Japan

<sup>4</sup> Lecturer, Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

<sup>5</sup> Associate Professor, Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

<sup>6</sup> Professor, Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, Kobe, Japan

<sup>7</sup> Professor, Department of Rehabilitation Science, Kobe University Graduate School of Medicine, Kobe, Japan

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### ABSTRACT

We report the case of a 32-year-old Japanese female with a giant cell tumor of bone involving multiple midfoot bones. Giant cell tumors of bone account for approximately 5% of all primary bone tumors and most often arise at the ends of long bones. The small bones, such as those of the hands and feet, are rare sites for giant cell tumors. Giant cell tumors of the small bones tend to exhibit more aggressive clinical behavior than those of the long bones. The present patient underwent en bloc tumor excision involving multiple tarsals and metatarsals. We reconstructed the longitudinal arch of the foot with a free vascularized fibular graft. At the 2-year follow-up visit, bony union had been achieved, with no tumor recurrence.

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Giant cell tumor of bone (GCTB) is a benign, locally aggressive neoplasm. It has been reported that GCT of the small bones carries a greater risk of local recurrence and metastasis than GCT of the long bones. Curettage, with or without adjuvant therapy, bone grafting, irradiation, and en bloc excision have been used in the treatment of primary GCTBs (1). En bloc excision ensures the lowest rate of recurrence (2), but it is difficult to reconstruct bone defects and recover a weightbearing gait after resection of GCTB in the lower extremities. We report a case of GCTB with extensive involvement of multiple midfoot bones in an adult female. We performed an en bloc excision and reconstructed the lateral longitudinal arch of the midfoot with a free vascularized fibular graft. Medial foot arch stability was achieved by arthrodesis. The patient provided written informed consent for publication of this case report and the accompanying images (a copy of the written consent form is available for review on request).

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**Conflict of Interest:** None reported.

Address correspondence to: Hitomi Hara, MD, PhD, Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, 7-5-1 Kusunoki-cho, Chuo-ku, Kobe, Hyogo 650-0017, Japan.

E-mail address: [mitohi@med.kobe-u.ac.jp](mailto:mitohi@med.kobe-u.ac.jp) (H. Hara).

### Case Report

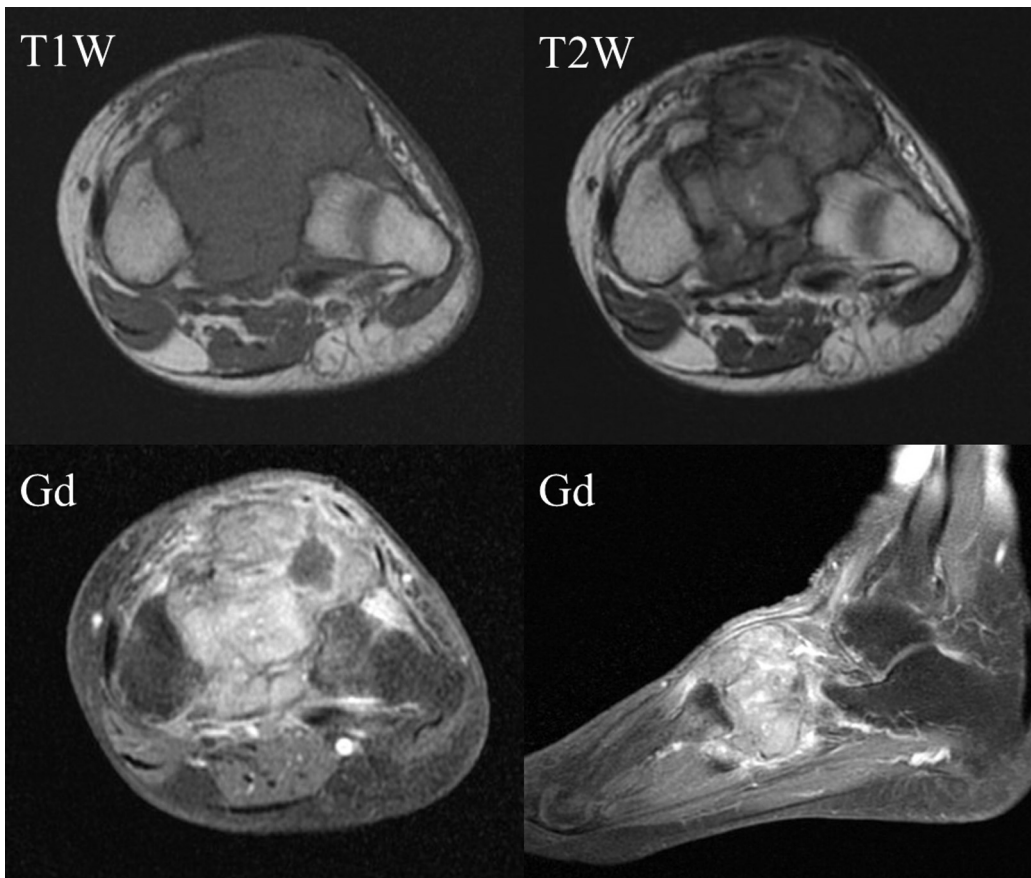
A 32-year-old Japanese female was referred to our hospital with a 1-year history of swelling and pain over the dorsum of her left foot. She was a housewife with 1 child, and she had rheumatoid arthritis and a body mass index of 18 kg/m<sup>2</sup>. Plain radiographs and computed tomography of the foot showed the near disappearance of the lateral cuneiform, with invasion of the surrounding bones (intermediate cuneiform, navicular, and cuboid; Fig. 1). Magnetic resonance imaging revealed an expansile lobulated lesion involving multiple tarsal bones and the surrounding soft tissue. The lesion was isointense on T<sub>1</sub>-weighted images and heterogeneously hypointense or hyperintense on T<sub>2</sub>-weighted images. After intravenous injection of gadolinium, the lesion enhanced heterogeneously on the T<sub>1</sub>-weighted images (Fig. 2). High uptake in the midfoot was seen with technetium-99m-hydroxy-methylene-diphosphonate bone scintigraphy. An open biopsy was performed through the dorsum of the foot. The histopathologic appearance was of uniform mononuclear cells mixed with numerous osteoclast-like giant cells that were large and contain many nuclei. No sarcomatoid features, such as the formation of bone or osteoid, were present. The histologic findings



**Fig. 1.** Oblique plain radiograph (A) and computed tomography images (B and C) of the left foot showing diffuse infiltration of an osteolytic lesion in the midfoot area.

confirmed a GCTB. From the imaging findings, the Campanacci grade (3) (Table) for our patient was defined as grade 3. We performed en bloc resection of the tumor, which had replaced some of the tarsal bones and had infiltrated the surrounding soft tissue. An ipsilateral vascularized fibular graft was harvested with 8.5 cm of fibula. The lateral foot arch was reconstructed with the fibula, extending from

the calcaneus to the fourth and fifth metatarsal bones. The calcaneus was osteotomized and sculptured to a concave portion to fit the fibular graft. The distal side of fibular graft was placed between the fourth and fifth metatarsal bones, which were decorticated at the contact surface. Bone fixation was achieved with cortical screws. Because the instability of the medial foot arch was slight, stability



**Fig. 2.** Magnetic resonance images showing a tumor involving multiple tarsal bones and surrounding soft tissue.

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