

Case report

Simultaneous arthrodiastasis and deformity correction for a patient with ankle osteoarthritis and lower limb deformity: A case report



Shuhei Ugaji MD, Koji Watanabe MD, Ph.D.^{*}, Hidenori Matsubara MD, Ph.D.,
Issei Nomura MD, Takao Aikawa MD, Hiroyuki Tsuchiya MD, Ph.D.

Department of Orthopedic Surgery, Kanazawa University Hospital, Kanazawa, Japan

ARTICLE INFO

Article history:

Received 23 September 2013

Accepted 23 October 2013

Keywords:

Ankle osteoarthritis

Arthrodiastasis

Deformity correction

External fixation

ABSTRACT

We here report a case of a 50-year-old male with ankle osteoarthritis and lower limb deformity, for which simultaneous deformity correction and arthrodiastasis were performed. The patient initially experienced an open fracture on the left tibia at 19 years, but it was malunited. The Japanese Society for Surgery score of the foot for the left ankle was 53 points. X-ray and CT imaging showed rotational and angular tibial deformities with shortening by 1.6 cm and end-stage osteoarthritis of the left ankle. An external fixator was applied to correct the lower limb deformity, and ankle arthrodiastasis was performed. A good result was achieved in alignment correction and joint function. The patient had an improved clinical score of 98 points at a 2-year followup. We found that external fixation was useful because external fixator is the only appropriate instrument by which arthrodiastasis and deformity correction for ankle osteoarthritis can be simultaneously performed.

© 2013 European Foot and Ankle Society. Published by Elsevier Ltd. All rights reserved.

1. Introduction

Ankle arthrodesis and total ankle replacement are considered the standard treatments for end-stage ankle osteoarthritis. Certain pain relief and stable long-term results can be expected following ankle arthrodesis; however, the procedure completely sacrifices ankle joint function. Secondary arthritis of the subtalar and talonavicular joints developed during the followup period in 17% and 11% patients, respectively. Progression of preexisting arthritis occurred in 30% patients at the subtalar joint and 19% at the talonavicular joint [1]. In addition, a previous study reported a high (54%) 2-year complication rate after total ankle replacement [2], and 30% patients required further treatment within 10 years [3]. Therefore, joint preservation surgery is desirable in more active and younger patients; because total ankle arthroplasty has a limited lifespan, it may not be indicated for these patients. Moreover, lower limb deformities cause osteoarthritis. Here, we report a case of end-stage ankle osteoarthritis accompanied with a lower limb deformity, for which simultaneous deformity correction and arthrodiastasis were performed.

2. Case report

A 50-year-old male had a history of Gustilo type IIIa open fracture of left tibia at 19 years, but the fracture was malunited. At 48 years, he experienced increased left ankle pain and was referred to our hospital. Physical examination revealed a 3-cm limb length discrepancy, varus deformity, dorsal flexion and plantar flexion with a range of motion of 5–35°, and a severe limp. The Japanese Society for Surgery of the foot (JSSF) ankle/hindfoot score [4] was 53 points (pain, 20 points; function, 28 points; alignment, 5 points). X-ray imaging showed a varus deformity of 9° and a posterior apex angular deformity of 4° at the tibial shaft. The mechanical axis passed through 5% of the knee joint from the medial edge (Fig. 1a and b). The patient's ankle joint exhibited widespread narrowing and Takakura/Tanaka stage IV osteoarthritis (Fig. 1c and d) [5]. Computed tomography (CT) revealed an internal rotation deformity of 37° (Fig. 1e). We diagnosed rotational and angular deformities of the shortened tibia and Takakura/Tanaka stage IV osteoarthritis of the ankle joint.

We planned applying an external fixator to correct the lower limb deformity and ankle arthrodiastasis [6]. First, an arthroscopy was performed to evaluate the ankle, which revealed articular cartilage loss and eburnation of the subchondral bone in the left ankle. Therefore, we performed debridement of the anterior osteophytes and bone marrow stimulation by drilling the subchondral plate [7]. Furthermore, an external fixator was applied, and the hinge was fixed to the ankle joint axis between the tips of lateral and medial malleolus (Fig. 2a). We distracted

^{*} Corresponding author at: Department of Orthopaedic Surgery, Kanazawa University Hospital, 13-1 Takara-machi, Kanazawa, Ishikawa 920-8641, Japan.
Tel.: +81 76 265 2374; fax: +81 76 234 4261.

E-mail address: nabechov2@gmail.com (K. Watanabe).

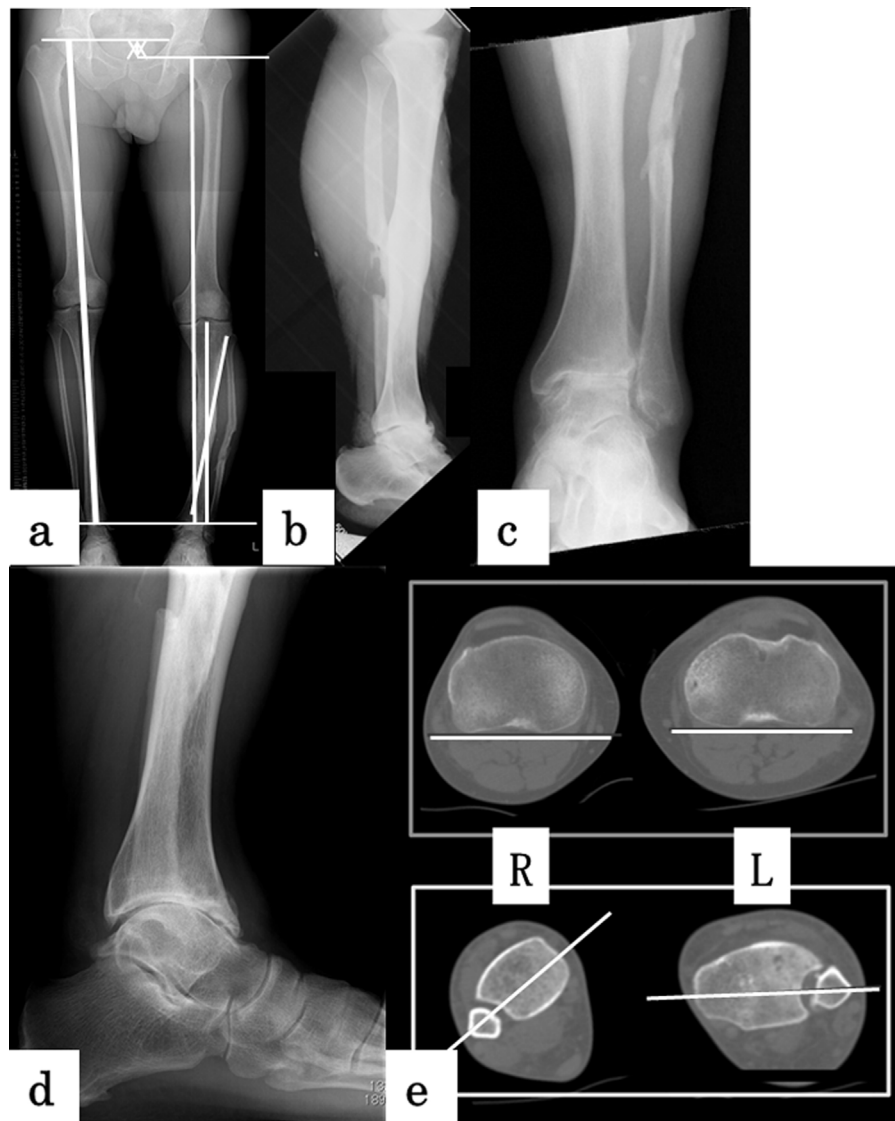


Fig. 1. Imaging studies. (a) The mechanical axis passed through 5% of the knee joint from the medial edge. (b) X-ray imaging showed a varus deformity of 9° and a posterior apex angular deformity of 4° at the tibial shaft. (c and d) The patient's ankle joint exhibited widespread narrowing and Takura/Tanaka stage IV osteoarthritis. (e) CT revealed an internal rotation deformity of 37° .

10 mm using an articulated fixator (Fig. 2b). The TSF (Taylor Spatial Frame™ (TSF), Smith & Nephew, Memphis, TN) was applied to the tibial diaphysis, and the tibial deformity at the center was osteotomized (Fig. 2c and d).

Postoperative management included arthrodiastasis (Fig. 3) with range-of-motion exercises (max planter flexion motion, 20 times/day) and nonweightbearing walking were continued for 14 weeks [8,9]. On postoperative week 18, the external fixator applied on the foot was discontinued.

The lower limb deformity was gradually corrected from postoperative week 2 and good alignment was achieved at postoperative week 5 (Fig. 4a). On postoperative month 6, autogenous iliac bone was grafted because of the delayed consolidation of distracted callus (Fig. 4b). However, bone union was delayed (Fig. 4c). On postoperative month 12, plate conversion and chipping were performed [10] (Fig. 4d). Two years postoperatively, bone union was achieved with good lower limb alignment, and weightbearing radiographs showed widening of the ankle joint space (Fig. 5). The patient's limp disappeared, and range of ankle motion was retained. The JSSF score was improved to 98 points (pain, 40 points; function, 48 points; and alignment, 10 points).

3. Discussion

We performed arthrodiastasis using an external fixator, which is commonly used to correct lower limb deformities. Arthrodiastasis seemed to optimize nutritional and reparative properties of the articular cartilage by mechanically unloading the joint and restoring intermittent-intraarticular hydrostatic fluid pressure change [11,12]. Simultaneously, we performed a microfracture technique, which enhances chondral resurfacing by providing a suitable environment for tissue regeneration and activating the body's own healing potential [13]. Arthrodiastasis is a controversial treatment; however, a previous study reported improvement in 73% patients as mid-term results after 7 years [14] and indicated that the procedure was suitable for young to late middle aged patients.

Misalignment of the lower limbs is contraindicated for arthrodiastasis because it induces osteoarthritis of the knee and ankle joint deterioration [15]. Deformity increases the onset rate of the osteoarthritis over 5 degrees, and normalized alignment through osteotomy equalizes stress to the ankle and reduces the load to the damage limb [16]. Therefore, we corrected the patient's

Download English Version:

<https://daneshyari.com/en/article/4054645>

Download Persian Version:

<https://daneshyari.com/article/4054645>

[Daneshyari.com](https://daneshyari.com)