

Examination of bony union rate after the arthrodesis surgery in the Charcot arthropathy of the ankle and foot

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INTRODUCTION:

The Charcot arthropathy shows a destructive change of the ankle and foot joints. It is caused by repetitive microtrauma and infection, or is associated with impaired superficial and deep sensation disorders due to diabetes mellitus and spinal cord disease. Although the instability of the ankle and foot joints caused by looseness of joint ligaments and bone destruction results in severe deformity, patients have very mild or no pain. Lack of illness insight in patients with Charcot arthropathy may cause severe infections with intractable callosity and ulcers in foot. Therefore, arthrodesis is the common procedure of choice to stabilize the foot and ankle joints and to maintain plantigrade bearing function, however, bony union may not be often obtained.

In this study, we examined the union rate of each joint after arthrodesis of Charcot arthropathy of the ankle and foot.

METHODS:

The subjects were 14 patients (6 males and 8 females) who underwent arthrodesis for the Charcot arthropathy of the ankle and foot, with the mean 60 years at the time of surgery. The primary diseases of Charcot arthropathy were diabetes mellitus in 5 patients, neuromuscular disease in 5 patients, spinal cord disease in 1 patient, post anticancer medicine administration in 1 patient, hemodialysis in 1 patient, traumatic injury in 1 patient, and unknown in 2 patients, including duplicate cases. The bony union rate after arthrodesis surgery at 6 months, 1 year, and 2 years postoperatively was investigated with examinations based on radiographic and computed tomography images.

RESULTS:

The arthrodesis surgeries were performed in 13 tibiotalar joints, 13 talocalcaneal joints, 6 talonavicular joints, 4 cuneonavicular joints, 5 calcaneocuboid joints, and 2 medial tarsometatarsal joints. The bony union was observed in 13 joints (30%) at 6 months postoperatively, 25 joints (58%) at 1 year postoperatively, and 28 joints (65%) at 2 years postoperatively. The tibiotalar joint had a 77% union rate at 1 year postoperatively and remained unchanged at 2 years. The talocalcaneal joint had a union rate of 38% at 1 year postoperatively and improved to 62% at 2 years postoperatively. The talonavicular joint had a 17% union rate at 2 years after surgery. There was no correlation between the joint number of arthrodesis surgeries simultaneously performed for one patient and the bony union rate.

As postoperative complications, there were no cases of deep infection, 2 cases of implant breakage, and 1 case of reoperation.

DISCUSSION AND CONCLUSION:

The bony union rate after arthrodesis for the Charcot arthropathy of the ankle and foot was not so good, 30% at 6 months, 58% at 1 year, and only 65% at 2 years after arthrodesis surgery.

Although the bony union may be relatively obtained for stable joints such as the tibiotalar and talocalcaneal joints, the bony union rate may be lower in talonavicular joint because the range of motion of talonavicular joint is large in three dimensions, moreover it was considered that the difficulty in the insertion direction of the screws for fixation and the limitation of the number of screws also affected the low fusion rate.

In conclusion, although the bony union of tibiotalar joint may be well, the bony union rate was 77% at 2 years postoperatively. The talocalcaneal joint union also improved at 2 years postoperatively (62%), however the bony union rate of talonavicular joint did not improve even if postoperative 2 years (17%).