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Fibula extension and correction of foot and ankle deformity to rectify post-osteomyelitis talipes equinovarus in a young adult: a case report and literature review

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Abstract. – OBJECTIVE: Talipes equinovarus is traditionally viewed in the literature as a congenital disease.

CASE REPORT: We present here a case of the acquired talipes equinovarus (clubfoot) in a young adult patient that has developed the following osteomyelitis.

RESULTS: We have successfully corrected this condition by fibula extension and correction of foot and ankle deformity, using external fixation device. The treatment period has extended over three years and involved two operations.

CONCLUSIONS: This case report will increase awareness of adult orthopedists on acquired talipes equinovarus and propose orthopedic reconstructive strategies to rectify this condition.

Key Words: Osteomyelitis, Complication, Talipes equinovarus, Lower limb, Deformity, Fibula, Reconstruction.

Introduction

Talipes equinovarus is predominantly discussed in the literature as a congenital disease[1]. The condition more often affects male infants and in about 50% involves both lower limbs[2]. We present here a case of the acquired talipes equinovarus (clubfoot) in a young adult patient. This condition has developed the following osteomyelitis and has been successfully corrected by fibula extension and correction of foot and ankle deformity, using external fixation device.

Case Report

An 18-years old female patient was seen in our Department in 2013 with the following complaints: shortening of the left limb and talipes equinovarus for the past 15 years. The patient had developed the symptoms at the age of 3 years old following the left tibia osteomyelitis. Talipes equinovarus and left limb shortening gradually followed the osteomyelitis, leading to a serious lower limb deformation (Figure 1).

Physical examination revealed left foot adduction and plantar flexion (talipes equinovarus), combined with left limb shortening by 9 cm, left ankle joint rigidity, and lateral skin callus formation. The leg and foot X-ray, and 3D CT reconstruction images are shown in, respectively, Figures 2 and 3. The diagnosis was made of acquired left talipes equinovarus, distal tibia deformation, and left limb shortening as sequalae of left tibia osteomyelitis.

As the strategy for reconstructive limb surgery, we have decided to conduct the foot and ankle deformity correction and reconstructive surgery. This procedure would also include fibula extension to correct the length's difference between both legs (Figure 2A).

On March 4, 2013, we have conducted the first surgery: left ankle orthopedic joint fusion, fibula cutting and fixation to external support to extend the bone (Figure 4). After five days following the surgery, we have begun the left limb lengthening protocol at 1 mm per day (Figure 5). Eleven months after the surgery, external fixation crews have been pulled up. The X-ray examination has demonstrated substantial bone growth and marked extension of the left shin (Figure 6). On physical examination, left shin has noticeably extended its length (Figure 7). It was also noticeable that left foot adduction has almost disappeared, and plantar flexion has greatly improved (Figure 7).

Eighteen months later, the second operation has been conducted to move up distal screws on left fibula external fixation, and to introduce the

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Figure 1. Physical examination of the affected foot. ***A*** and ***B***, Left foot adduction and plantar flexion (talipes equinovarus) are seen. ***C***, Lateral skin callus formation.

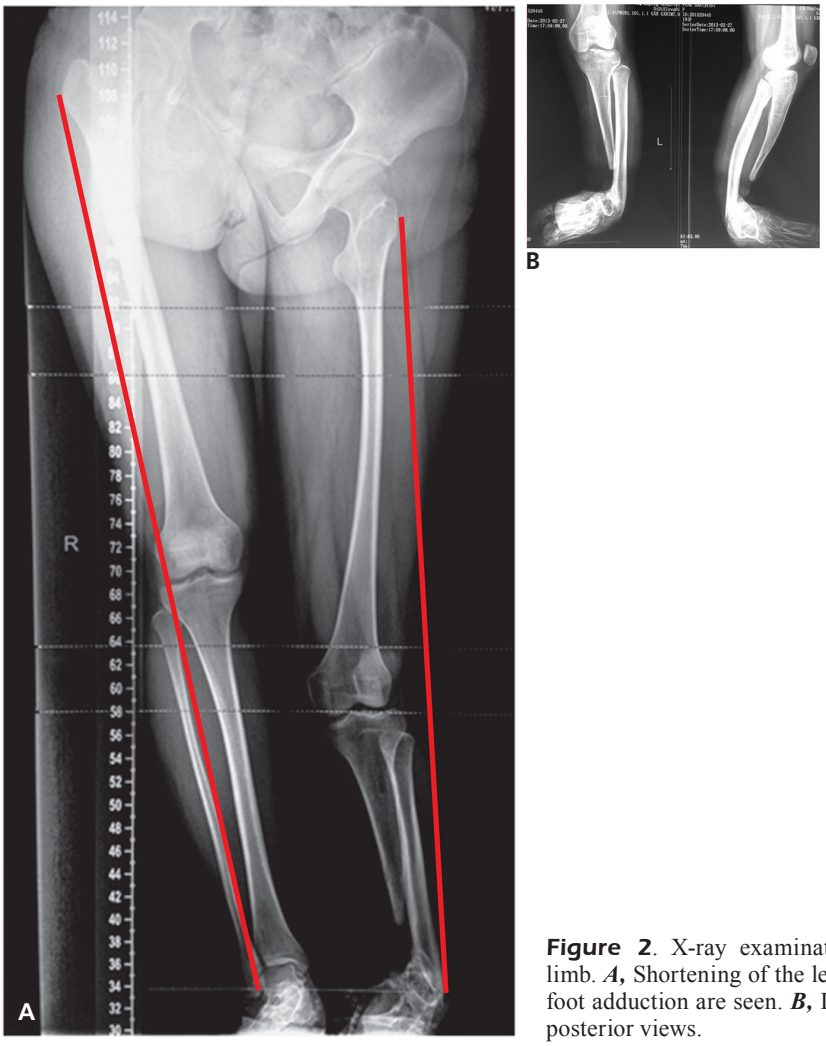

Figure 2. X-ray examination of the affected limb. ***A,*** Shortening of the left leg length and left foot adduction are seen. ***B,*** Left foot, frontal and posterior views.

Figure 3. 3D CT reconstruction of the affected limb. ***A***, Frontal view. ***B***, Posterior view.

iliac bone graft into the tibiofibular middle fusion (Figure 8). Following this, the surgery site was allowed to heal for 24 months to foster the tibiofibular middle fusion (Figures 9A and 9B), after which external fixation has been removed completely (Figures 9C and 9D). One month later (25 months after the second surgery), the physical examination has demonstrated full recovery of the limb function (Figure 10A). The X-ray examination has shown that left shin has extended by 7 cm (Figure 10B). The remaining limb length difference was corrected by orthopedic shoes.

Discussion

Talipes equinovarus or clubfoot is mostly a congenital disease manifesting in early postnatal life[1]. The literature on this clinical condition usually deals with correction of this condition in infants[2,3], which is mostly done using the Ponseti method, with various modifications[1,3-8]. There is also literature on rectification of recurrent congenital disease in adult patients[9-17]. For some of the adult patients with recurrent congenital clubfoot, an approach similar to ours, using the external Ilizarov fixation device, has been reported[18,19]. We are, thus, not aware of previous reports of post-osteomyelitis acquired talipes equinovarus. We describe here that fibula extension and foot and ankle reconstruction have successfully been used to treat such condition in a young female patient. This approach has had to be undertaken due to substantial length difference between both legs, and foot/ankle deformation. The Ponseti method used to treat this condition in infants is a

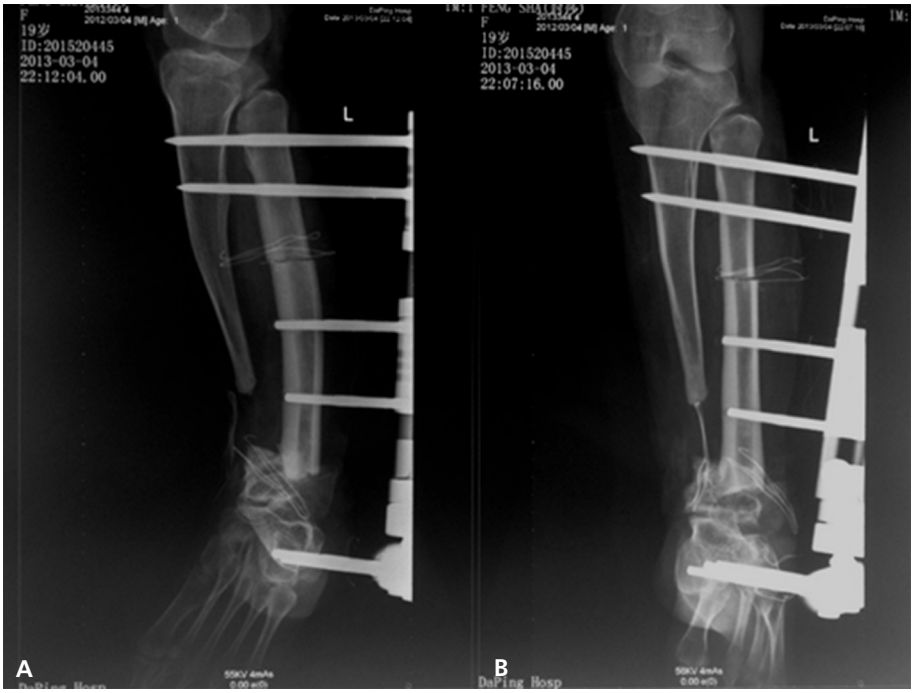

Figure 4. First operation. Left ankle orthopedic joint fusion, fibula cutting and fixation to external support to extend the bone.

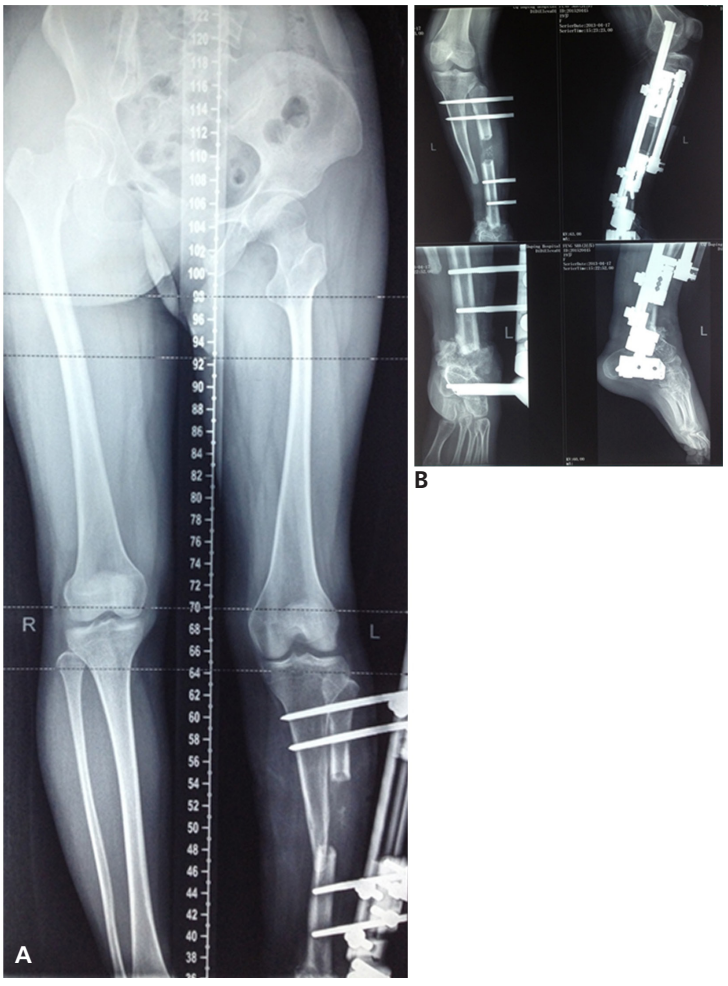

Figure 5. Left limb lengthening protocol. ***A.*** Shortening of the left leg length is less noticeable. ***B.*** Left foot, frontal and posterior views.

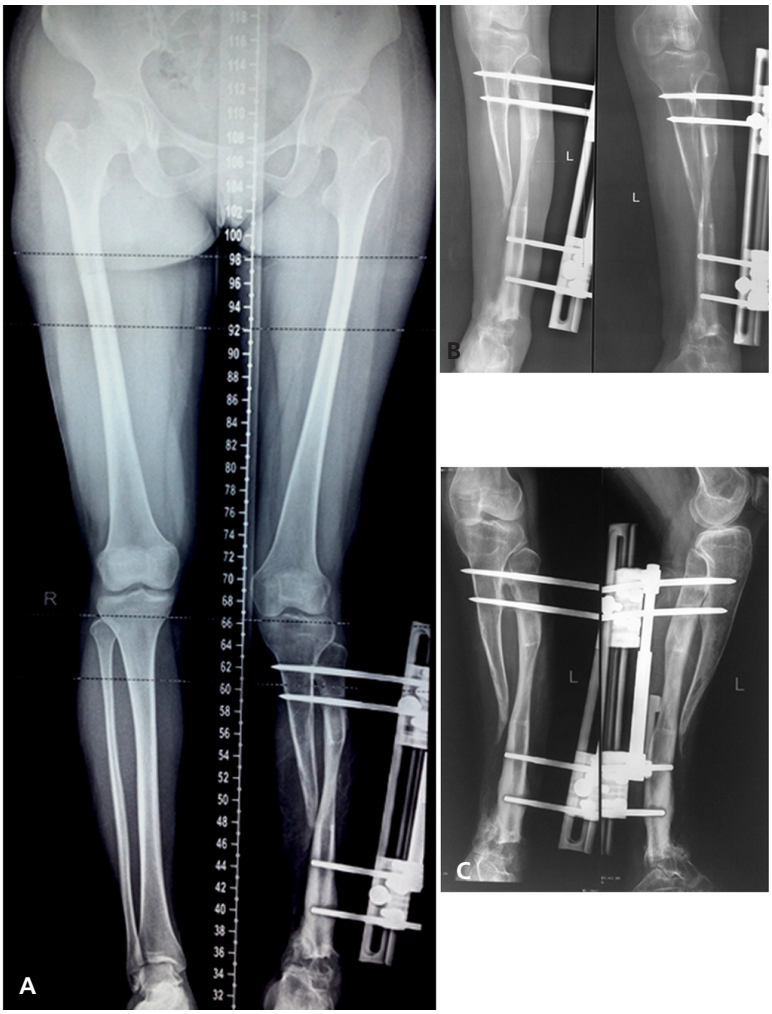

Figure 6. Left limb lengthening protocol, 11 months after the surgery. ***A,*** Substantial bone growth and marked extension of the left shin. ***B,*** Left foot.

Figure 7. Physical examination of the affected foot. Left foot adduction and plantar flexion have markedly improved.

Figure 8. Second operation. The second operation has been conducted to move up distal screws on left fibula external fixation, and to introduce the iliac bone graft into the tibiofibular middle fusion.

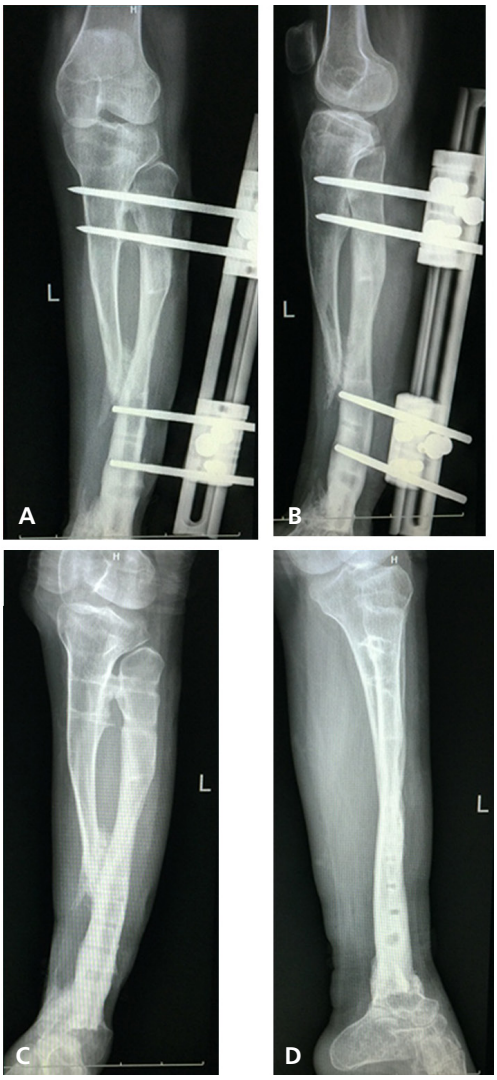

Figure 9. Twenty-four months after the second operation. Tibiofibular middle fusion before (***A*** and ***B***) and after (***C*** and ***D***) removal of external fixation.

Figure 10. Twenty-five months after the second operation. ***A,*** Physical examination demonstrates full recovery of the limb function. ***B,*** X-ray examination shows extension of the left shin by 7 cm.

conservative approach, involving using gypsum casts, but this approach would not have extended the affected shin to a length comparable to the unaffected leg. Therefore, we have decided to use the approach described above, which involved two operations, slow extension of the fibula using bone grafts and external fixation until a comparable length of the affected leg has been reached.

Conclusions

This case report aims to increase awareness of adult orthopedists about acquired talipes equinovarus and to propose orthopedic reconstructive strategies to rectify this condition.

Conflicts of interest

The authors declare no conflicts of interest.

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