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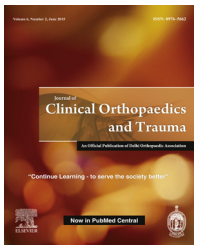

Case Report

Natural tibialization of fibula in non-union tibia: Two cases

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ABSTRACT

Background: Non-union of tibia is known to be a common complication after fracture both bones of leg treated conservatively. During the course of natural healing, fibula usually unites early as it had more soft tissue attachment and vascular supply. Due to early union of fibula and absence of axial force across the tibia, it undergoes non-union.

Case characteristics: Two cases, a 32-year-old male and 65-year-old female treated conservatively for fracture both bones of leg long years back, presented to us with mild calf pain on and off. On radiological examination, there was non-union of tibia along with compensatory fibular hypertrophy to the extent that fibula became main weight bearing bone.

Outcome: In both the cases, we observed gross fibular hypertrophy in presence of non-union of tibia.

Conclusion: In conservatively treated cases of fracture, both bones of leg, non-union of tibia may coexist with compensatory hypertrophy of fibula to the extent that, it becomes main weight bearing bone of the leg.

We are presenting here two cases of natural tibialization of fibula along with nonunion tibia. Our article supports the theory of Wolff's law.

1. Introduction

As an orthopedic surgeon we frequently deal with fracture of tibia and fibula. Fractures of tibia are the most common long bone fracture and occur at a frequency of about 26 fractures per 100,000 population per year.[1–3] They are approximately three times more frequent in males than in females. Among both bones of leg, tibia is a major weight bearing bone as it transfers weight of upper skeleton to the foot. The fellow bone mainly plays a role in syndesmosis at proximal and distal ends of tibia. It is fracture tibia that is the major concern for all surgeons. Nonunion of tibia is common because of its subcutaneous anatomic location, less soft tissue coverage, frequent open fracture, precarious blood supply mainly in lower third of tibia. There are various methods mentioned in literature for the treatment of non-union tibia.[4–7]

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We are presenting here two cases of natural tibialization of fibula along with non-union tibia. Our cases satisfy the law stated by German anatomist Julius Wolffe, who said "bone in a healthy person or animal will adapt to the loads under which it is placed. If loading on a particular bone increases, the bone will remodel itself over time to become stronger to resist that sort of loading.[8–14]

2. Case report

2.1. *Case 1*

A 32-year-old male patient came to our outpatient department with chief complaint of vague pain in right calf on and off for past 2 months. There was no other significant complaint. On physical examination, there was no swelling, local rise in temperature or any tenderness in calf. Range of motion of knee and ankle was full and painless. Bony irregularity was noted in the mid part of leg on medial aspect which was non-tender on palpation. On further detailed history, patient mentioned about trauma to same leg 7 years back. It led to fracture of both bones of leg, for which patient had taken treatment in the form of long leg cast for 2 months and followed by patellar tendon bearing cast for a month. Patient had no complaints since then. Patient has been walking without aid for past 7 years. We advised radiograph of right leg with ankle and knee antero-posterior and lateral view. On radiological evaluation of X-ray, there was thin radiolucent oblique line at the level of fracture site with hypertrophic and sclerosed fracture end (Fig. 1).

Fig. 1 – Antero-posterior and lateral views of both bones of leg showing non-union tibia with widened and dense fibula.

Fig. 2 – Clinical photograph of patient showing deformed post-poliotic limb.

Fracture of fibula was united and appeared to be dense and widened along its whole length. This was an incidental finding of remodeled and hypertrophic fibula in non-union tibia. Patient was asymptomatic for past 7 years and had no functional limitations as well as bearing full weight on leg. So no active intervention was done. Further radiological assessment could not be done as patient lost to follow-up.

2.2. *Case 2*

A 65-year female patient with post-polio residual paralysis in right leg came to our outpatient department with non-healing ulcer in the same foot. On physical examination, the leg appeared to be thinned and deformed as compared to the opposite limb (Fig. 2). There was varus deformity at the ankle joint. Patient had developed pressure sore in the right deformed foot measuring 4 cm × 3 cm. Patient was subjected to X-ray of right foot and leg. On radiological examination of radiograph, tarsal bones of foot appear to be deformed and smaller in size with equino-varus deformation at ankle and sub-talar joint. No osteomyelitic changes were seen in foot. There was thin radiolucent line at the mid-part of tibia showing nonunion. Fibula was hypertrophied, widened and

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