

**LETTER TO THE EDITOR**

## Reply to “A Critical Review of Proximal Fibular Osteotomy for Knee Osteoarthritis”

**Dear Editor**

We would like to congratulate Vaish et al for their article published in your journal (1). The authors have performed a commendable analysis of available literature on a procedure which has been a topic of interest and also of scepticism recently. Though we concur with most of their findings, we would like to add some information to this otherwise outstanding article.

While the literature search has been quite extensive, including Medline and Embase searches to this could have added more value. We, in our recent review of proximal fibular osteotomy (PFO), identified ten articles in English literature (2).

The schematic representation of the preferred site of excision and the surgical pictures add value to the study. However, there is possibly more than one mechanism that contributes to the clinical and radiological improvement after PFO. While the mechanism of non-uniform settlement appears to be the most logical explanation, we would like to point out the following additional mechanisms that could contribute to the outcome:

**a. Too-many-cortices theory**

This theory, which could be considered a simplification of the non-uniform settlement theory, stresses the differences in the number of cortices supporting the medial (one tibial cortex) vs the lateral (one tibial cortex and two fibular cortices) in a medially collapsing knee.

**b. Slippage phenomenon**

This phenomenon makes proper consideration of the medial subluxation of the femur on the tibia in a varus knee and the resultant increase in the Knee Adduction Moment. This in turn enhances the non-uniform settlement, thereby causing progression of the varus deformity. This procedure can be expected to reverse this process (3, 4).

**c. The theory of competition of muscles**

Authors have described immediate improvement

in pain after PFO. While the above mechanisms would require time to effect clinical and radiological improvement, the competition of muscles identified by Huang et al possibly contributes to immediate post-operative improvement (5). The authors identified increase in activity of the long head of biceps femoris and a reduced activity in the peroneus longus on the operated side immediately after surgery. This could explain the early improvement in hip-knee-ankle (HKA) angle from varus to a more neutral alignment and pain relief early after surgery. However the findings are yet to be replicated and long-term studies are needed to assess whether these are lasting effects.

**d. The theory of dynamic fibular distalization**

Qin et al reported that clinical improvement after surgery correlated with the amount of distalization of the fibula and also with the inclination angle of the proximal tibiofibular joint (6). The authors proposed that after PFO, the proximal fibula was subject to tensile forces from the soleus and the peroneus longus, causing distalization of the proximal fibula. This tensile force was concomitantly transmitted from the fibular head to the lateral femoral condyle thus narrowing the lateral knee joint space.

**e. Ground reaction vector readjustment theory**

Xie et al attributed immediate symptom relief after PFO to biomechanical changes in the foot (7). According to them, after PFO the lateral malleolus migrates proximally and pulls the calcaneus into further valgus via the calcaneofibular ligament. This leads to a more laterally directed ground reaction vector that relieves pressure on the medial knee and causes instant pain relief. However, the authors did not prove their theory.

Guo et al disproved this theory in their prospective study of 49 patients (8). They proved that no proximal migration of the lateral malleolus took place and there was no significant postoperative valgus alignment at the ankle. Rather, there was improvement in ankle valgus

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after PFO.

The evidence available to date appears to raise more questions than give answers. Double-blinded randomized controlled trials are required to confirm the efficacy of PFO and to establish its place in the management of osteoarthritis of the knee. We have raised a few questions that could help the direction of future research on this subject (2).

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