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Response to "Letter Regarding: Preliminary Outcomes of Calcaneal Lengthening in Adolescent Flatfoot in Müller-Weiss Disease"

Dear Editor:

We thank Dr Myerson for his interest in our recent article "Preliminary Outcomes of Calcaneal Lengthening in Adolescent Flatfoot in Müller-Weiss Disease"[1] and we carefully read his comments. To begin with, the authors understand the conflicts that may be raised by this newly introduced approach for treating selected cases of this complicated problem of Müller-Weiss Disease (MWD). The rationale of treatment was presented in the discussion. Indeed, multiple controversies continue regarding its etiology, pathophysiology, natural history, and the optimal methods of treatment.

Regarding the rarity of MWD in children, we agree with Dr Myerson, and this was already mentioned in the limitations of the study and could be due to under-recognition or a low suspicion index. The authors did not claim that it is exclusive to adolescents but rather this was a selection criterion. Similarly, MWD is not limited to adults. MWD cases were presented as early as 13 years of age.[7] Monteagudo and Maceira[9] described MWD as navicular dysplasia that is almost always developed in childhood and suffered in adulthood.

The presented adolescents were grade IV. Maceira and Rochera[7] postulated that the 5 stages of MWD may develop progressively during infancy with the chondral navicular bone. After ossification, the progression of deformity stops, and the morphologic changes remain. They also declared that their classification is descriptive and without prognostic value. The transition among the increasing deformity degrees is not seen in patients on the long-term follow-up.[7]

Contrary to flexible flatfoot with excessive hindfoot valgus, flatfoot cases in our study paradoxically had neutral or mild valgus hindfoot. However, we disagree with Dr Myerson regarding the consistency of the hindfoot varus in all cases, and his statements that "the disease has been referred to as a pes plano varus deformity," and "it has been stated by *all authors* of the subject that heel varus is the hallmark of the disease process." First, this is not an applicable synonym for all MWD cases as flatfoot is not present in all MWD cases (at least in the first 3 stages). Only *the flatfoot cases* will have that term.[7] Second, whereas Maceira and Rochera[7] considered that the hindfoot varus is a constant finding in MWD, the consistency of this finding *was not* confirmed by several authors. Zhang et al[15] reported 1 pes cavus in 11 MWD feet. In addition to the reported varus hindfoot, the hindfoot position varied among different studies, including flatfoot without hindfoot varus,[15] neutral hindfoot,[13] and flatfoot without a comment on hindfoot position.[2,3] Moreover, Haller et al[5] reported 5 MWD cases with flatfeet and hindfoot *valgus* deformity. So, the presence of lateral sclerosis of the navicular bone, which is typically comma shaped, is diagnostic of MWD regardless of the hindfoot position in varus or not. Furthermore, other features of MWD were present in all cases of our study as relative hypertrophy of the second metatarsal and an index minus metatarsal formula.

Regarding the foot flexibility, this was a selection criterion. Moreover, the resulted deformity correction and elevation of the collapsed foot arch as evidenced clinically and radiographically in the figures of the article confirm prior flexibility. Few studies presented the subtalar motion. Although reported by some authors as reduced,[7,14] the subtalar motion was normal in other studies.[10-12]

We also disagree with Dr Myerson that MWD patients have a low body mass index (BMI). MWD patients usually have higher BMI.[8] For example, Fornaciari et al[4] reported an average BMI of 29.6 in their series, and Hetsroni et al[6] reported a mean BMI of 27. This was consistent with our findings.

About Dr Myerson's question "Why would the authors select a procedure that is going to worsen the prominence of the navicular tuberosity?" The authors put this probability into consideration in planning for the surgical technique. For this, we inserted 2 wires across the talonavicular joint for stabilization as already presented in the surgical technique and Figure 2 of the article. Therefore, what was expected by Dr Myerson was absent in the presented final radiographs and clinical photos.

Despite the lack of reported incidence, we agree with Dr Myerson that MWD is not a rare condition. Perhaps it is more common than might be expected.[9] We have seen several MWD cases accidentally discovered on radiographic examination of foot trauma. What we considered as a limitation of the study is the rarity of the selected cases among

the whole spectrum of MWD. In other words, the presented treatment is not applicable for all cases. Treatment should be individualized for every case whether conservative, valgus calcaneal osteotomy, calcaneal lengthening, or different kinds of fusion.

Sincerely,

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