Reply to comments by Wu et al. regarding our manuscript titled: A minimally invasive technique for surgical treatment of hallux valgus: simple, effective, rapid, inexpensive (SERI)

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Dear Editor,

We gratefully acknowledge the letter from Wu et al. commenting on our manuscript titled: “A minimally invasive technique for surgical treatment of hallux valgus: simple, effective, rapid, inexpensive (SERI)” [1]. In fact, we trust that one of the main reasons to report surgical results and technique is to begin a discussion that can further clarify concepts to the scientific community. We welcome the opportunity to reply to Wu et al.’s comments on a point-by-point basis:

1. Several studies have focused their attention on the proper technique of lateral soft tissue release, whether conventional open or transarticular; regardless, open lateral soft tissue release is performed in patients undergoing distal osteotomies to compensate for insufficient correction of hallux valgus achieved by the osteotomy [2]. We believe that manual stretching of the lateral soft tissues, when performed by skilled surgeons, provides results comparable with surgical release. We acknowledge that not all patients may benefit from this manoeuvre in the same fashion. In most postmenopausal women with mild to moderate hallux valgus, it is easy to achieve soft tissue release using a gentle and progressive manoeuvre of the

metatarsophalangeal joint, which after osteotomy and head translation results in repositioning of the metatarsal head over the sesamoids. In younger patients and in those with the lateral sesamoid which is completely dislocated in the intermetatarsal space, a lateral soft tissue release is performed using a percutaneous approach. At the end of surgery, when the metatarsal head is correctly displaced, the sesamoids will appear in the correct position: it is not always necessary to perform open surgery. Therefore, in contrast from what occurs in open procedures, minimally invasive procedures are accompanied by a lateral soft tissue release only in carefully selected cases. Subcapital osteotomies, in particular, despite usually not being associated with lateral soft tissue release, allow repositioning of the metatarsal head and properly repositioning the sesamoids and are associated with good long-term results [3].

2. A 1-cm-long incision is sufficient to perform the osteotomy with a direct line of visualization; the osteotomy can be directed according to patient requirements and according to pre-operative planning, with the aim of recovering the lateral dislocation of the sesamoids. It also allows cutting the small bone tip at the medial edge of the diaphyseal osteotomy and eventually addressing small osteophytes of the exostoses with a small rongeur. Usually, exostoses are not the expression of newly formed bone, and once the head is corrected, it they disappear. Only rarely is it necessary to remove a small dorsal osteophyte. Finally, we do not cut the bunion on the medial side, as it is structurally part of the sesamoid sling [4]. (a) The SERI osteotomy is subcapital and extra-articular. In this sense, no direct effect on the capsular tissue is expected. (b) The SERI osteotomy is not meant for patients with hallux rigidus, and we agree with Wu et al. that in patients with hallux rigidus, SERI osteotomy should not be performed. We already reported our surgical guidelines for treating hallux rigidus [5] and

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addressed this issue in the manuscript [1], where stiffness and severe arthritis of the metatarsophalangeal joint (Regnault grade >2) are exclusion criteria for performing the SERI osteotomy. However, in cases of minimal cartilage degeneration (Regnault grade ≤ 2), the osteotomy itself can shorten the length of the metatarsal and therefore decompress the metatarsophalangeal (MTP) joint, thus slowing the degenerative process. This is witnessed by our data, where only 5.6 % of feet showed a worsening of joint degeneration; of course, these patients were associated with a poorer outcome.

3. A single 2-mm-diameter Kirschner (K)-wire fixation is sufficient to provide stability to an oblique subcapital osteotomy; in fact, the K wire is passed through the capsule and up to the tip of the toe distally. Proximally, it reaches the base of the metatarsal. It is a common experience that it is not possible to easily mobilise such wire after fixation. However, as indicated by our results and results of other authors reporting on a similar kind of fixation [3, 6], nonunion and delayed union, as well as dorsal malunion, are extremely rare with this kind of fixation, as the dorsal translation is also limited by the sagittal oblique osteotomy line, which approximates 15° in the dorsal to plantar and the distal to proximal direction, which improves the intrinsic stability of the construct.
4. To observe the results of surgery for hallux valgus correction, it is sufficient to report data over a medium-term follow-up, above all considering that recurrence of the deformity usually occurs within one year from surgery. We reported data from the first 1,000 feet in 641 patients (thus including results from our own learning curve), with an average follow-up of five to ten years. The reported data are accompanied by a real-time surgical video explaining all surgical steps. As evidenced by reading the manuscript, we did not show positive outcomes only, and we critically reported results that worsened because of joint degeneration or relapse.

In conclusion, the specific comments by Wu et al. are representative of comments that arise at every foot and ankle surgery congress between supporters of minimally invasive

surgery and surgeons performing traditional open procedures [7]. The main issue still remains: that there are numerous surgical procedures by which to manage hallux valgus, and no single intervention technique can be considered better than the others. We consider the SERI technique a solid, rapid and reproducible technique that, in selected patients, is associated with positive results, low costs and an acceptable complication rate; it was also recently demonstrated in a prospective case–control study that compared outcomes of the SERI procedure against a Scarf osteotomy [8]. Finally, we acknowledge that careful preoperative patient evaluation, which includes assessing the hindfoot and barefoot and general health status of the patient is quintessential for adequate surgical planning and optimising clinical outcomes.

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