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## CORRESPONDENCE AND COMMUNICATION

Optimizing donor site outcomes after microsurgical proximal interphalangeal joint transfer using the bone-peg technique

#### Dear Sir,

Vascularised joint transfer is an option in patients who have had severe traumatic or osteoarthritic changes to their proximal interphalangeal joint (PIPJ).<sup>1–3</sup> However one of the major drawbacks of the procedure is donor site morbidity and preserving the length of the second toe after transfer.<sup>1</sup> Microvascular transfer of composite tissues can result in significant damage to the donor toe(s) in such a manner that it outweighs the benefit of the reconstructed digits.<sup>4</sup> Authors have therefore described the use of tibial and iliac bone graft<sup>5</sup> to close the donor defect hence preserving phalangeal length. However there have been disappointing results with this technique.<sup>1</sup>

We propose a simpler approach that avoids further donor site morbidity from tibial or iliac bone harvest and can better maintain phalangeal length and stability. The operation begins by preparing the PIPJ with a longitudinal incision. Transverse osteotomies are then made with an oscillating saw to remove the PIPJ. Suitable veins and artery are found in the recipient digit and the size of the bony defect is measured.

At the donor site the vascularised PIPJ is removed along with its neurovascular pedicle and fitted into the recipient bone in a 'peg and socket fashion'.<sup>1</sup> Osteosynthesis is carried out using a combination of Kirshner wires and looped dental wire.

We have previously described the 'exchange' of the resected PIPJ being used for the reconstruction of the donor toe.<sup>3</sup> We have modified the technique over the years by insetting the recipient PIPJ into the donor toe as a bone peg.

Firstly the bone is trimmed to size and shape making it thinner, this allows for less tension on wound closure and



**Figure 1** Radiograph of second toe donor site at 1 year. Phalangeal length has been preserved without evidence of resorption.

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Figure 2 Clinical appearances of donor site demonstrating preserved length of second toes.

more optimal healing as the bone is non-vascularised. The distal and proximal ends of the resected PIPJ are fitted into the intermedullary cavity of the donor bone in a peg and socket fashion. Ideally the bone pegs should enter the distal and proximal cavities by 0.5 cm. Osteosynthesis is then achieved with Kirschner wire fixation that is eventually removed at 4 weeks.

The 'peg and socket' method optimizes bone healing in the non-vascularised transfer of the PIPJ to the donor site by increasing the surface area of bone-to-bone contact. This consequently reduces the amount of long-term bone resorption (See Figures 1 and 2). Furthermore transfer of bone graft is not necessary if there is adequate PIPJ after resection.

This simple technique is of use for both the donor and recipient site after microsurgical PIPJ transfer reducing problems with bone non-union and resorption. It may also have further applications in cases of challenging non-union in the hand as well as a role in osteosynthesis in digital replantation.

### **Conflicts of interest**

None.

### Funding

None.

### Ethical approval

N/A.

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