Use of the “20” Memory Staple in Osteotomies of Fusions of the Forefoot

Definition, History, Generalities

This staple first provides a permanent compression both in the prongs extremities and in the oval part which unites the two prongs.

During the last fifteen years, we have used a memory staple in one indication: The shaft osteotomy of the great toe first phalanx. It is the memory staple “12” – i.e. 12 mm distance between the two prongs – but it was neither strong enough nor large enough to have indications other than the great toe PI osteotomy. So, we devised a stronger and larger staple (20 mm) for the other indications in foot surgery, i.e.: fusion of the first MTP joint, of the Lisfranc’s joint, osteotomies of the metatarsals, and osteotomy or fusion of the hindfoot.

Indications and Results

Basal Metatarsal Osteotomies
(Fig. 21a)

Principally it is the first metatarsal osteotomy, notably the elevation osteotomy, or the varisation osteotomy. For the other metatarsals, we use only the “20” memory staple in case of non union after any osteotomy.

Fig. 21a. Basal osteotomies of the first metatarsal.
1. Variation osteotomy for correction of introgeneric hallux varus (see Fig. 14c3).
2. Elevation osteotomy for correction of over pressure under the first metatarsal osteotomy or for pes cavus.
3. Treatment of a non union of metatarsal osteotomy.
Fig. 21b1. The “20” memory staple in the 1st MTP fusion: 1. **Technique.**
1. The principles of the “20” memory staple are the same than the “12” inter axis staple, *i.e.* bilateral compression – both on the oval part and on the prongs extremities – and permanent elasticity but the inter axis is up to 20 mm and is adapted with strong ness.
2. Removal of the cartilage to reach the subchondral bone, avoiding to reach the cancellous bone.
3. Pride perforation if required.
4, 5. Temporary double K-wiring and checking of the correct great toe position in both horizontal and sagittal planes. Our rule: Not too much MTP dorsal flexion, *i.e.* 2 cm between the heel and the board) and a slight MTP valgus, assessed by the Load Simulation Test.
6, 7. The two staples are set.
6. The first staple in a transverse plane, through the medial cortex.
7. The second one in a sagittal plane, through the dorsal cortex, is set slightly proximally comparatively to the transverse staple.

Fig. 21b2. The “20” memory staple in the first MTP1 fusion. **Advantages.**
1. 2. Very small resection of the fragment extremities allowing to keep as far as possible the great toe length.
3. Permanent compression allowing good healing in spite of inter fragmental resorption.
4, 5, 6. In case of non-union of previous fusion attempt, good results with only removal of the osteosynthesis implants and setting of the memory staple.