CASE REPORT

A Report of 89 Hallux Valgus Cases with 356 Inion OTPS™ Biodegradable Pins

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The Cases

Altogether 89 hallux valgus cases of types I, II, and III (Figure 1) were treated with dynamic metatarsal osteotomy using Inion OTPS™ Biodegradable Pins. Of these, 46 were done by using the percutaneous technique and 43 by open technique. All patients had postoperative dressing for 2-3 weeks. Weight bearing was allowed immediately after operation.

The results were compared to 90 cases which were done with stainless steel K-wires. The surgeries were performed between January and September 2006 and the follow-up was from three to nine months.

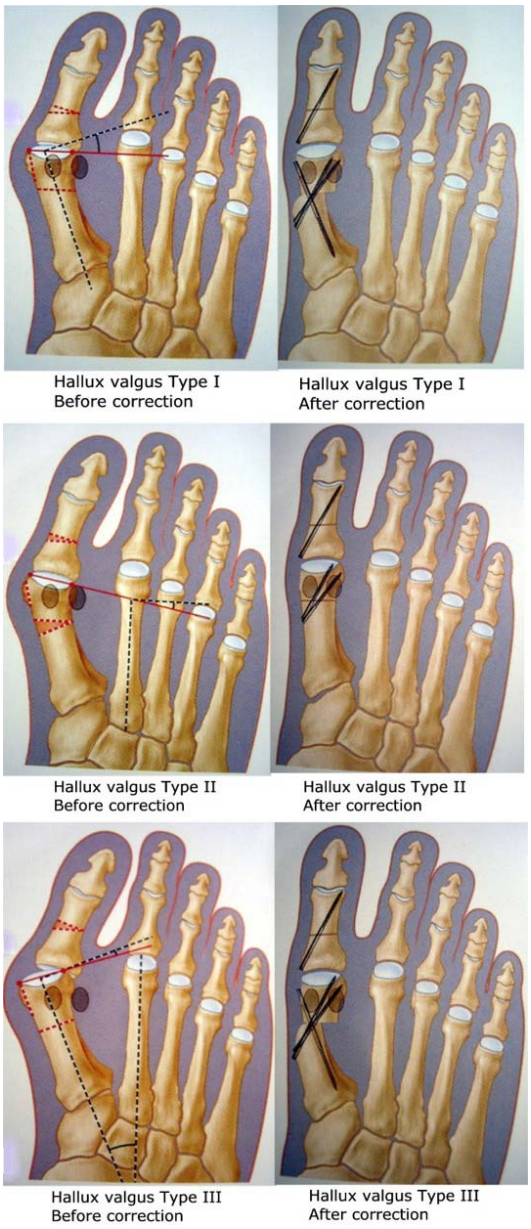

Figure 1: Hallux valgus surgery types I, II, and III before and after correction.

Surgical technique: percutaneous approach

Percutaneous technique was used especially in young and elderly patients and with patients who had a congenital disease. It is associated with a learning curve but the cosmetic results are better with this technique and hence it is preferred when possible.

The operation begins with a minimal exostosectomy to the medial side of the first metatarsal head (Figure 2). Medial release is performed by cutting the lateral elements (Figure 3). Consequently, distal metatarsal osteotomy and metatarsal translation using a temporary 2.0 mm k-wire are performed under fluoroscopic guidance (Figure 4 and Figure 5).

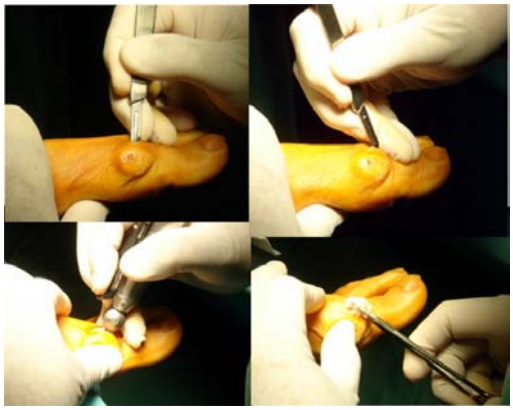

Figure 2: Minimal exostosectomy.

Figure 3: Medial release.

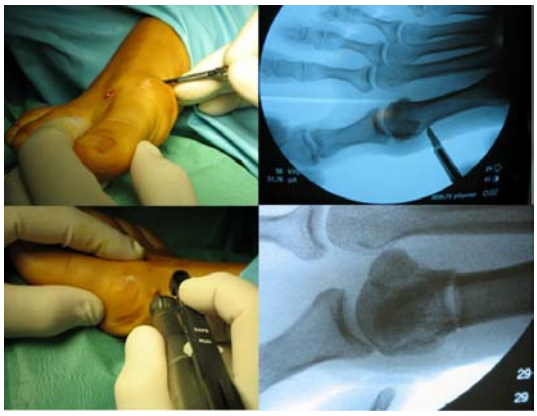

Figure 4: Distal metatarsal osteotomy.

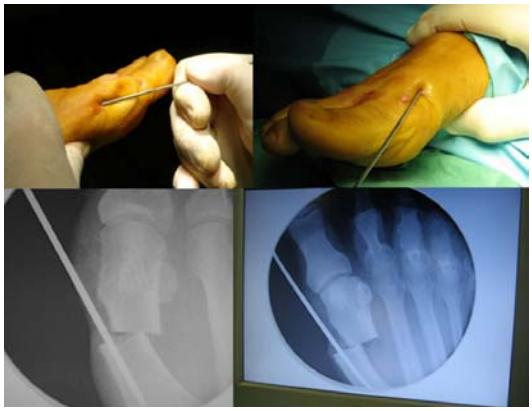

Figure 5: Metatarsal translation with a temporary k-wire.

The second and third temporary metatarsal fixation k-wires are inserted next (Figure 6 and Figure 7) after which the k-wires are replaced by three Inion OTPS™ 2.0 mm Biodegradable Pins (Figure 8 and Figure 9).

After fixing the first metatarsal, a phalanx osteotomy is performed (Figure 11). The phalanx is fixed temporarily with two 2.0 mm k-wires (Figure 12). The final fixation of the phalanx is performed by replacing one k-wire with an Inion OTPS™ 2.0 mm Biodegradable Pin (Figure 13) after which the second temporary pin is removed. The wound is closed and a dressing is applied for two to three weeks. The patient may start walking immediately.

Figure 6: Temporary metatarsal fixation, second k-wire.

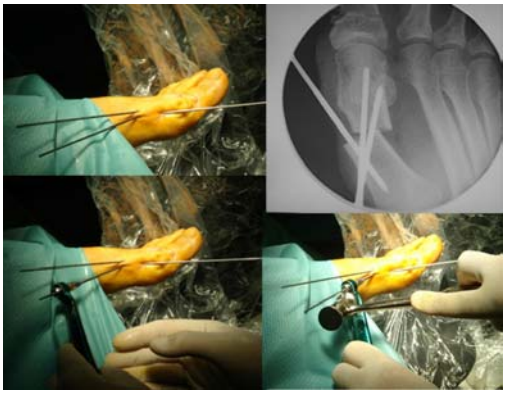

Figure 7: The third temporary k-wire.

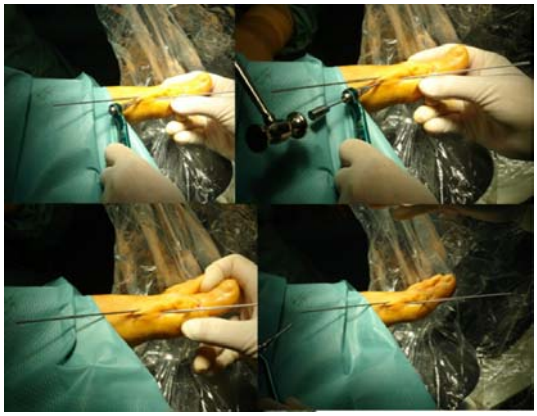

Figure 8: The first Inion OTPS™ Biodegradable Pin.

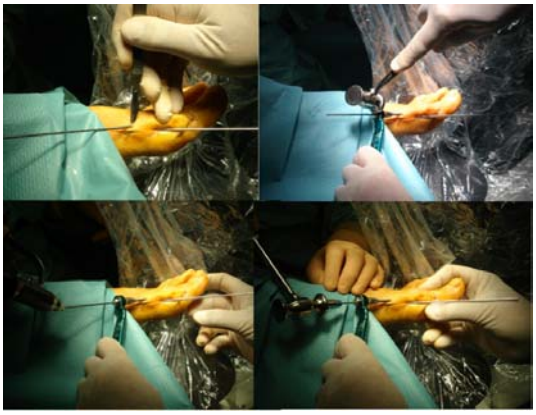

Figure 9: The second Inion OTPS™ Biodegradable Pin.

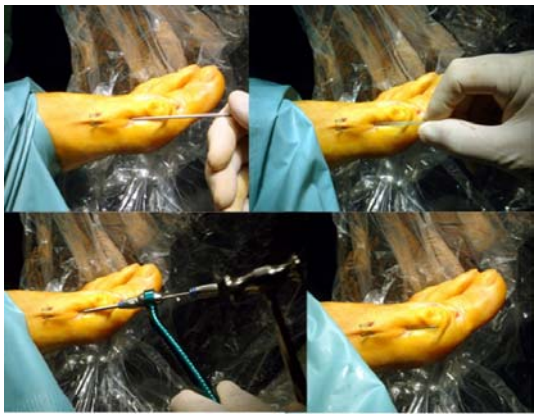

Figure 10: The third Inion OTPS™ Biodegradable Pin.

Figure 11: Phalanx osteotomy.

Figure 12: Temporary fixation of the phalanx.

Figure 13: Inion OTPS™ Biodegradable Pin for the phalanx fixation.

Results

All 89 hallux valgus corrections with altogether 356 Inion OTPS™ Biodegradable Pins yielded good results. All osteotomies healed well. There were no non-unions, allergic reactions or tissue reactions. Pin mobilization occurred with 16 pins (4.5 %), one of which was associated with superficial infection. There were altogether six (6.5 %) instabilities of the metatarsal osteotomy with recurrent deformation. However, four of these cases were the first cases done with biodegradable pins and hence they can be attributed to the learning curve associated with using a new implant system. The two remaining instabilities occurred with a non-compliant and a heavily over-weighed patient. One of the patients developed algodystrophy, and three had stiffness in their forefoot. A smoker had a problem with cicatrisation. Overall, the results were comparable to the group receiving metallic fixation and 80 percent of patients were free of pain the day after surgery.

Conclusion

Metallic pins offer greater initial stability in comparison to biodegradable fixation. This case series nevertheless shows that a lesser initial stability is not an issue when operative technique has been mastered and patients are selected properly.

Inion OTPS™ Biodegradable Pins offer a more economic choice in comparison to metallic pins because the patients do not have to return to removal surgery. In this case series, there were only a few cases where revision surgery to patients with

biodegradable fixation was necessary because of complications such as instability or pin mobilization. All instability cases could be attributed to either a learning curve with the new products, patient non-compliance and a bad patient selection. Similar problems may have occurred with these patients regardless of which fixation was used.

There are a few problems with Inion OTPS™ Biodegradable Pins. Firstly, the pins are radiolucent and hence do not show in radiographs. This may be a problem if there is a need to monitor the position of the pin after surgery. Also, fragility of the pin may be a problem before the surgeon becomes familiar of the handling characteristics of the pin. Because of the mechanical properties of the biodegradable pin, its smaller initial stability may cause problems if proper postoperative immobilization is not applied. Based on this case series, a dressing and a well-fitted shoe for two to three weeks in conjunction with Inion OTPS™ Biodegradable Pins provide a good initial stability for the osteotomies to heal uneventfully.

These 89 hallux valgus cases show that the Inion OTPS™ Biodegradable Pins perform well in this indication. Approximately 80 % of patients walked free of pain the day after surgery. In comparison to metallic fixation, which patients often find daunting, the Inion OTPS™ Biodegradable Pins are real progress for the patient and the surgeon.