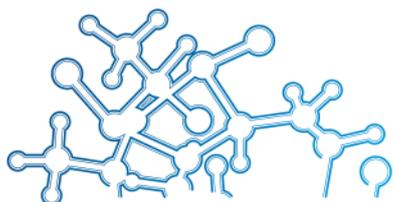


# Hallux Valgus Correction Using ActivaPin™ and ActivaNail™

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M.D., Ph.D.

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## Summary Table

Patient initials: JTH

Smoking: No

Use of alcohol: No

Other disease: No

Contin. medication No

Sex: Female

Age: 43 years

Height: 172 cm

Weight: 99 kg

**Operator: Heikki Mäenpää**

Dg no.: M46.9 and M20.1

DG: Spondyloarthropatia NAS, hallux valgus, metatarsalgia

Operation no: NHK40 X2 and NHK99

Operation: Osteotomia metatarsus nro I (chevron) et osteotomia metatarsus nro II (w eil), capsuloplastia MTP I, tenotomia t. adductor hallucis

Injury date: -

Operation date: 29.3.2012

Operation ti 44 min

Hospital stay: 1 day

Sick leave: 56 days

Immobilisation: Hallux Valgus shoe

Prim. weight bearing: Limited weight bearing for 6 weeks

Sec. weight bearing: Full weight bearing after 6 weeks

Bloodless field during operation: Yes

Prophylactic antibiotics: No

**Implant 1:** ActivaPin REF B-AP-2040

Implant performed: Good

LOT: S11022

Drilling: K-wire

**Implant 2:** ActivaNail REF B-ANC-2015

Implant performed: Good

LOT: S9062

Drilling: K-wire

Operation: -

Notice: -

	Primary	6 weeks	8 weeks			
Operator:	Heikki Mäenpää	Frederic Weitz	Frederic Weitz			
Obj. result:	Good	Good	Good			
Subj. result:	Good	Good	Good			
Primary position:	Exact	Exact	-			
Bone union:	No	Good	-			
Swelling:	Mild	Mild	Mild			
Redness:	Mild	Mild	No			
Pain medication:	Occasional medic.	No medic.	No medic.			
Second operation:	No	No	No			
Range of motion:	Def. 10-30deg.	Normal	Normal			
Sports activities:	No activities	No activities	No activities			
Tissue reaction:	No	No	No			
Infection:	No	Superficial*	No			
Thrombosis:	No	No	No			
Radiol. final posit.:	Stable	Stable	-			

Notice: At 6 weeks redness and swelling persisted. Staphylococcal infection (erysipelas) was suspected and cephalosporine antibiotic was prescribed for 10 days (750mg x 2/day). Redness resolved well in two weeks, but some swelling still persisted. Cause of the swelling is most likely a mal function in the blood circulation of the feet.

## 1 Case Description

The patient was 43 years old female with medical history of spondyloarthritis, obesity and fibromyalgia. Patient was admitted to hospital because of painful hallux valgus of the right foot and metatarsalgia. Preoperative X-ray examination showed mild osteoarthritis of the first MTP joint with hallux valgus angle (HVA)  $29^\circ$  and inter metatarsal angle (IMA)  $15^\circ$ . Metatarsalgia and osteoarthritis of the second metatarsal head was caused by the osteochondritis as a consequence of the Freiberg's disease. The left foot had hallux valgus angle (HVA)  $18^\circ$  and intermetatarsal angle (IMA)  $12^\circ$ .

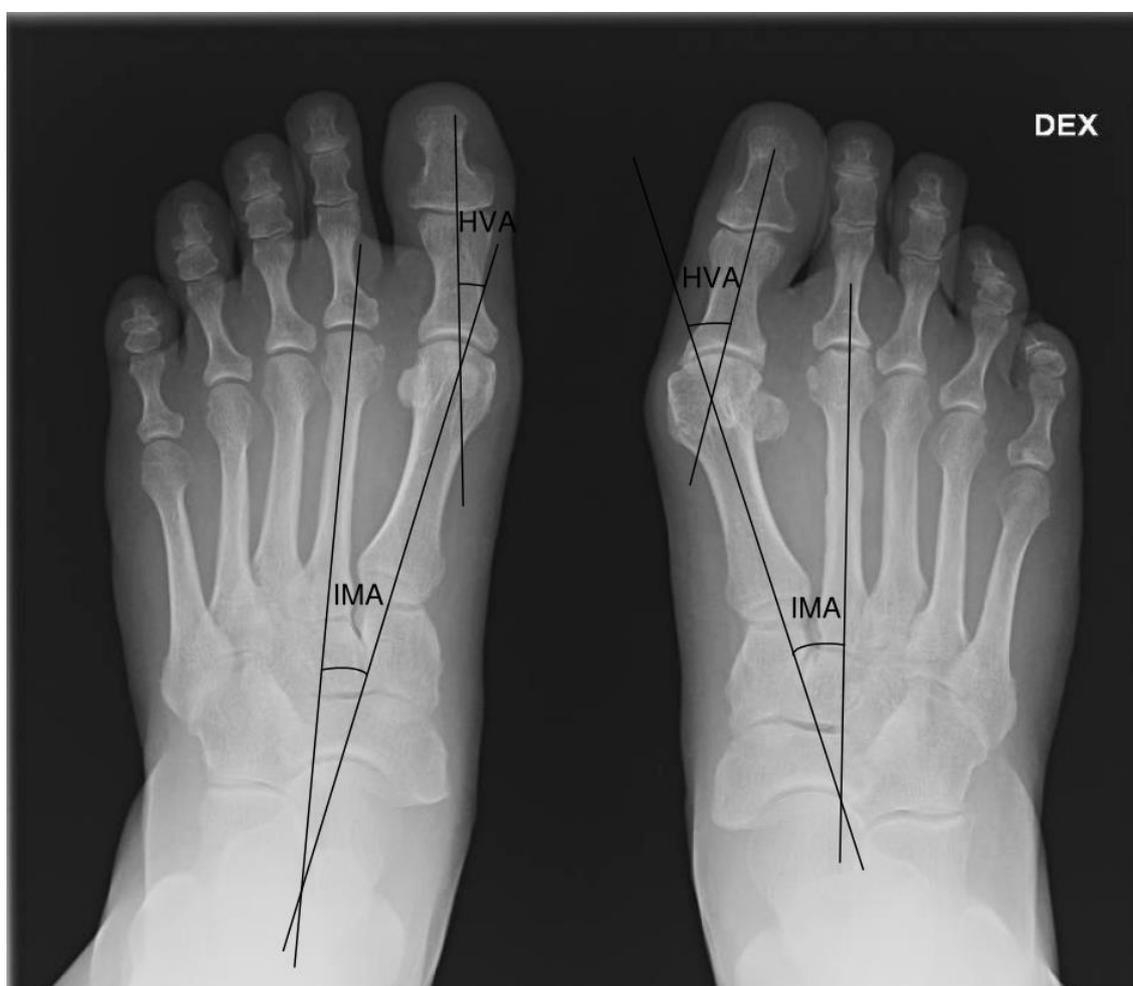


Figure 1 Preoperative X-ray with hallux valgus angle (HVA) and intermetatarsal angle (IMA) drawn on the picture.



*Figure 2 Natural view of the hallux valgus of the right foot. Notice also swollen MTP II joint.*

In order to relieve the pain and restore the normal anatomy of the foot operative treatment was decided with chevron osteotomy of the first metatarsal head and soft tissue reconstruction. In addition, Weil osteotomy was decided to be carried out on second metatarsal as a decompressive procedure.

## 2 Surgical Procedure

Procedure was started with soft tissue manipulation. Skin incision was made in the web space between the first and second metatarsals. Distal end of the adductor tendon and lateral sesamoid were released.

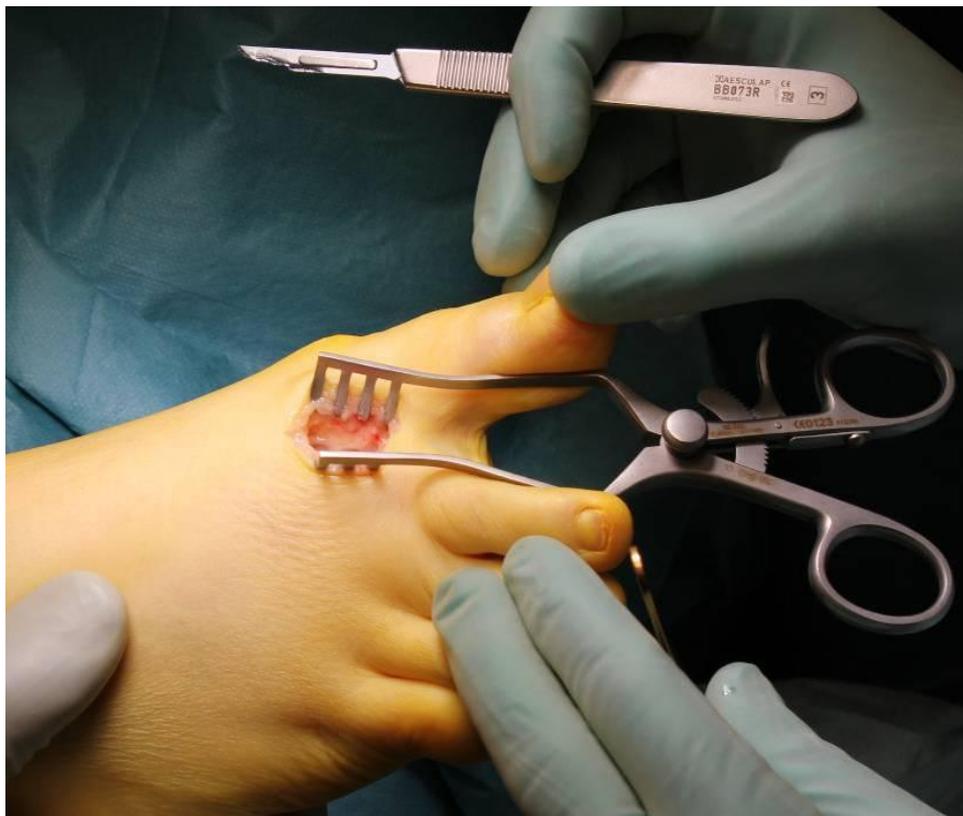


Figure 3 Skin incision between first and second ray.

A full thickness capsular incision was made on the medial aspect of the 1<sup>st</sup> MTP joint.



Figure 4 Preparation of the medial 1<sup>st</sup> MTP joint.

Removal of the bunion was carried out to sagittal sulcus of the medial side of the first metatarsal head using an oscillating saw.

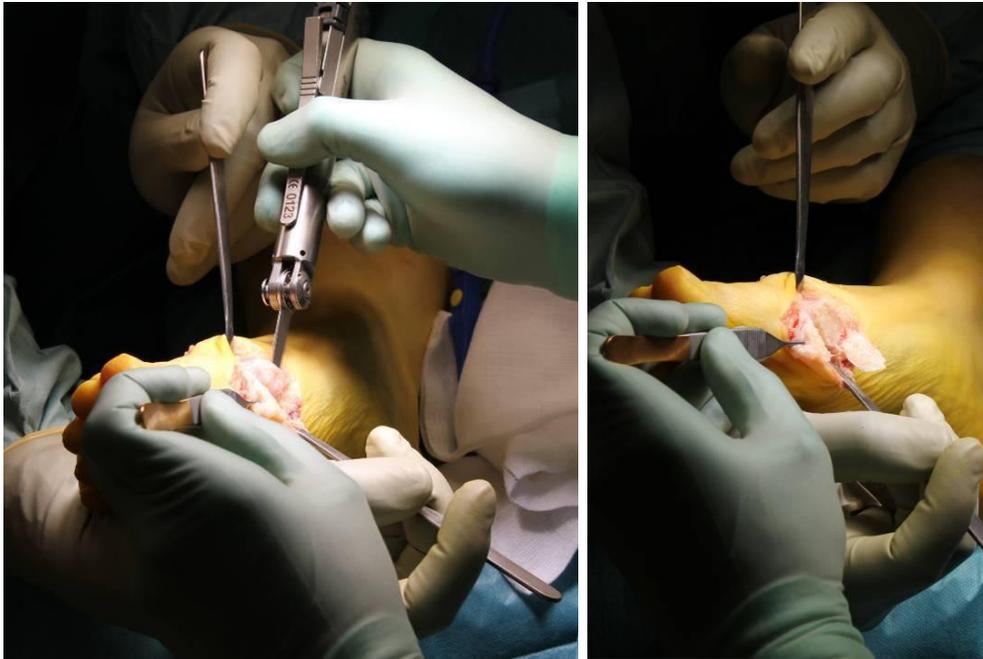


Figure 5 Exostectomy

A hole was drilled in the center of the metatarsal head to mark the apex of the osteotomy.



Figure 6 Marker hole drilling.

The chevron osteotomy was cut at approximately 60° angle using an oscillating saw. The osteotomy was finished with a chisel.

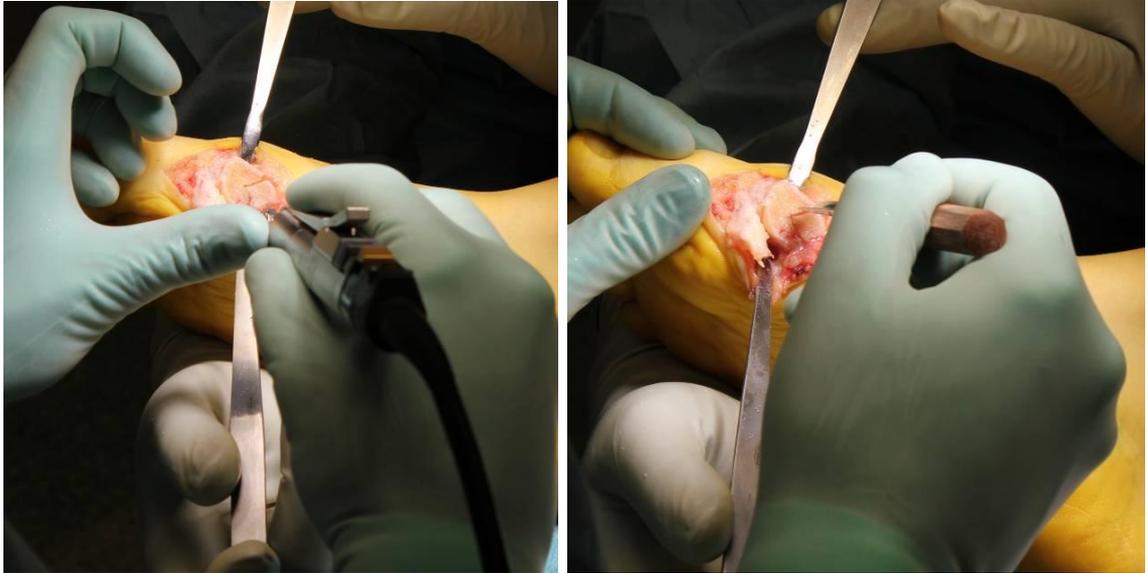


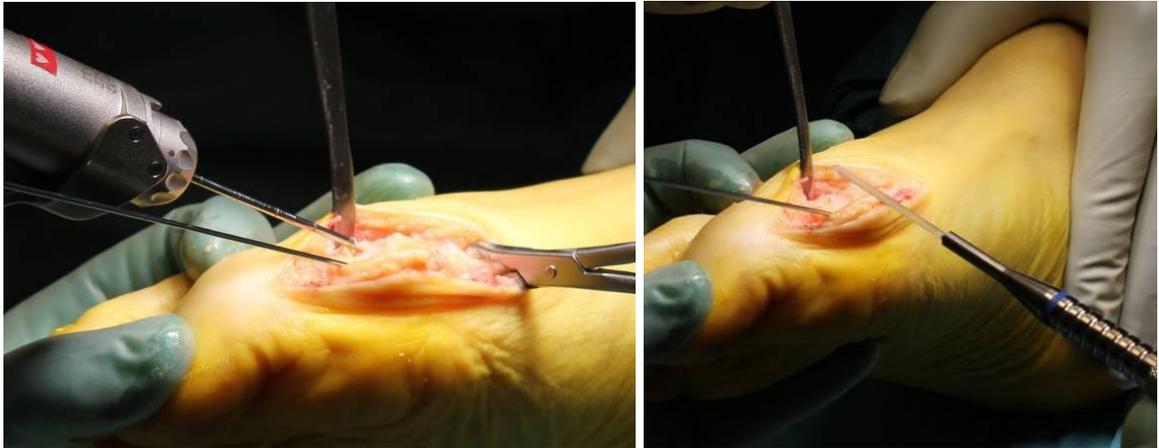
Figure 7 The osteotomy cutting.

Capital fragment was displaced approximately 5 mm laterally.



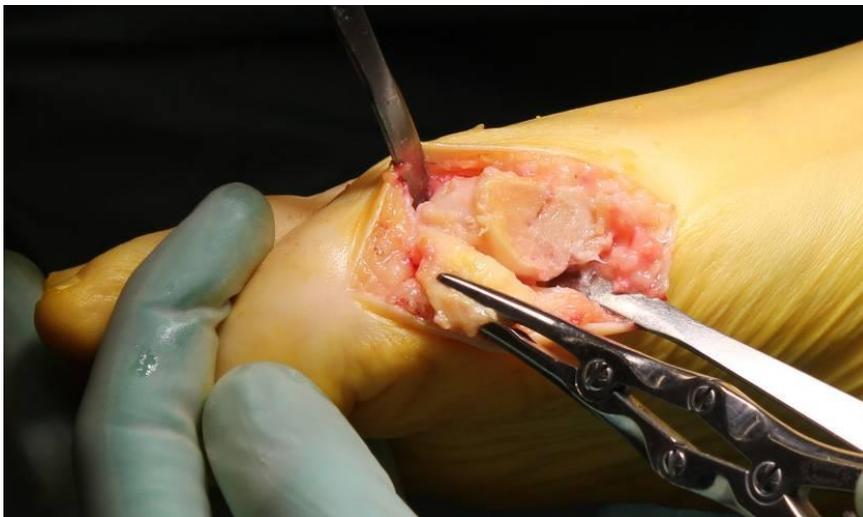
Figure 8 Displacement of the capital fragment.

The osteotomy was temporarily fixed to the displaced position with a 1.25 mm Kirschner wire. Fixation of the osteotomy was made using an ActivaPin™ 2.0 x 40 mm. The hole for the implant was drilled with a 2.0 mm Kirschner wire.



*Figure 9 Left: Temporary fixation with a 1.25 mm Kirschner wire and drilling a hole for the ActivaNail™ with a 2.0 mm Kirschner wire. Right: ActivaPin™ 2.0 x 40 mm with the applicator.*

The medial flare was shaved with an oscillating saw.



*Figure 10 Removal of the medial flare.*

Soft tissue manipulation was finished by tightening of the medial capsular tissue using 1-0 absorbable sutures to gain a neutral position for the toe.



*Figure 11 Tightening of the medial capsule.*

Weil osteotomy was made to second metatarsal head in order to decompress the second MTP joint. The procedure was carried out through the incision made in the web space between the first and second metatarsal.



*Figure 12 Second metatarsal head revealed for the Weil osteotomy.*



Figure 13 Osteotomy cutting.

Temporary fixation of the osteotomy was made with 0.8 mm Kirschner wire. The actual fixation was made with one ActivaNail™ 2.0 x 15 mm. The hole for the ActivaNail™ was drilled with 2.0 mm Kirschner wire. The nail was tapped into the drill hole while supporting the second metatarsal from the plantar side. Both incisions were closed in layers.

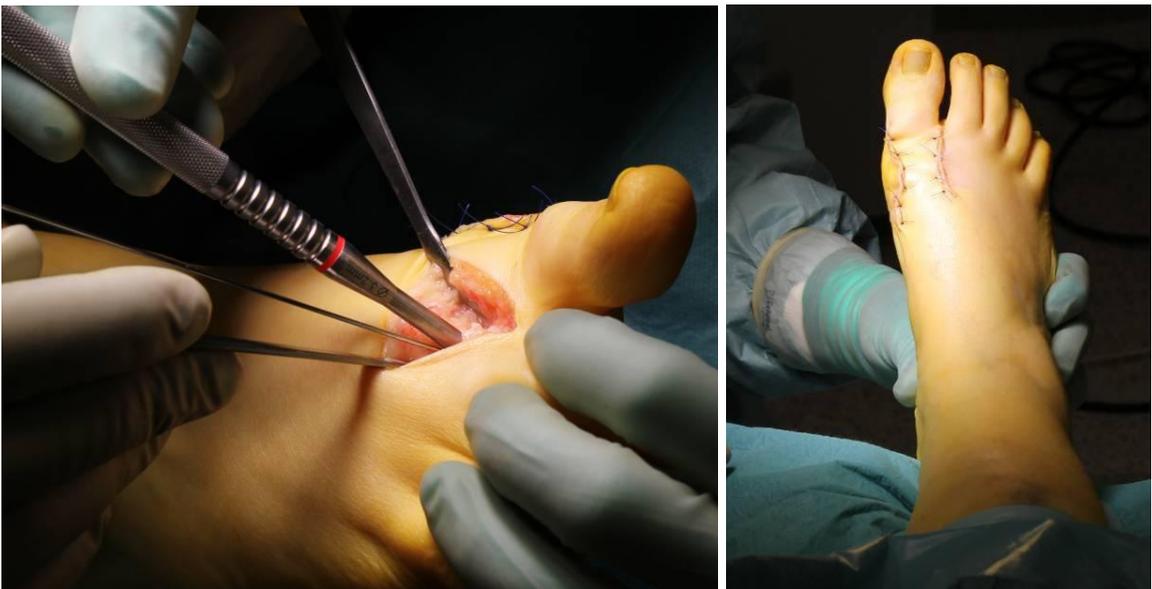


Figure 14 Left: Fixation of the osteotomy, Right: End result of the procedure

As a postoperative care metatarsal heads were firmly bound together with a bandage. Note that dressing was wrapped in counterclockwise direction in order to support the corrected first ray position.



*Figure 15 Left: Dressing is applied between the toes to support the corrected first ray position, Right: postoperative dressing wrapped counterclockwise to best support for the new position of the first ray.*

Postoperative immobilization regimen of 6 weeks with a hallux valgus shoe was instructed. Weight bearing was allowed with a natural limitation by pain. Sutures were removed after healing of the wound.

### 3 Results

Stable osteotomies were seen in the fluoroscopy picture as well as hallux valgus correction of the MTP I joint and decompressed MTP II joint. Hallux valgus angle (HVA) was 23° and intermetatarsal angle (IMA) 13°.

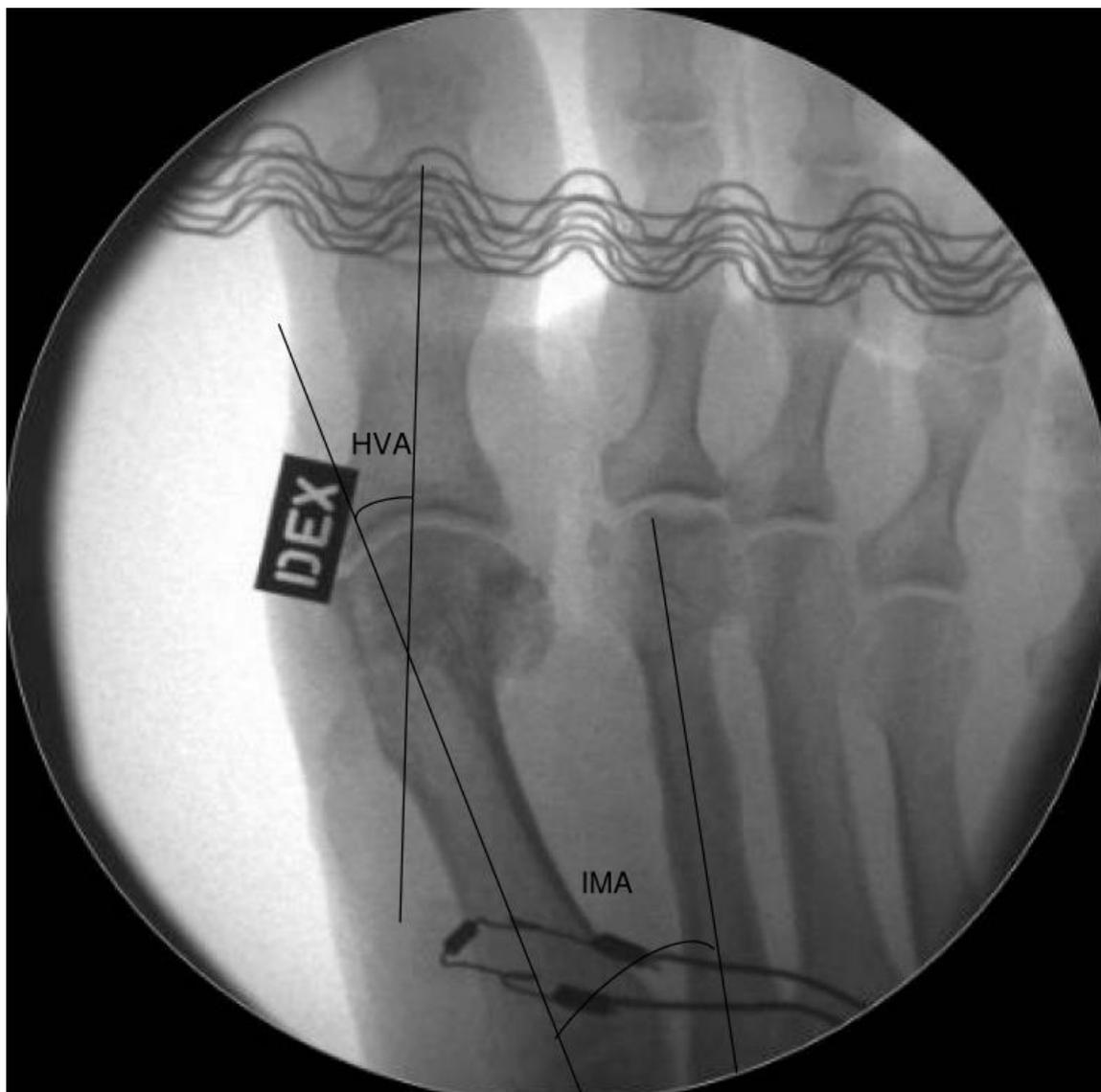


Figure 16 Postoperative control X-ray at 6 weeks.

On the clinical control visit at 6 weeks the foot was found to be good both subjectively and objectively measured, but redness and slight swelling of the operation area was noted. Due to patient's medical history (spondyloarthropathy with cortisone medication) staphylococcal infection (erysipelas) was suspected and cephalosporine antibiotic was started (750mg x2/day).

At 8 weeks control in clinical examination it was noted that the redness had almost completely disappeared but some swelling still persisted. Support socks were described to help resolving the swelling of the feet. At 8 weeks there was still some pain on the medial side of the first metatarsal, but that is expected to be resolved in course of time.

## 4 Conclusion

ActivaPin™ and ActivaNail™ are well suitable for fixation of chevron, Weil and many other osteotomies in foot surgery. Grooved surface of these implants adds rotational stability, which is beneficial when osteotomies are fixed with a single fixation device. The strength and biomechanical performance of these products widens the applicability into more demanding indications than typically found suitable for bioabsorbable pins.

Comparing to metallic fixation devices the benefits of these products to the patient are clear. The grooved of ActivaPin™ and ActivaNail™ surface offers a new type of stabilization in the osteotomies. The ability to modify the implant during the surgery yields more anatomical end result. Due to the bioabsorbability the patient does not need to undergo a second surgery for hardware removal and long term complications to the implant material are avoided.

In our clinical practice we have not encountered clinically noticeable adverse tissue reactions while using Bioretec Activa -products.

## 5 Contact Information Concerning the Case

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