

HALLUX VALGUS

MINIMALLY INVASIVE SURGERY

Document produced by the GRECMIP group (Research and Study Group * for Minimally Invasive Foot Surgery) and the TALUS group from GECCO (www.gecco-medical.org) - updated in 2012.



Minimally invasive treatment for Hallux Valgus should meet the same criteria as open surgery and should allow one:

1. to realign the first phalanx on the M1 head,
2. to reduce OMM angle,
3. to reduce the medial prominence of the head,
4. to release the lateral portion of the metatarsophalangeal joint of the 1st ray and to release its adductor,
5. to incorporate a varus osteotomy of the base of P1.



6 months post-operative view, showing a correction by minimally invasive surgery

The standard technique does not include fixation of metatarsal and phalangeal osteotomies, which are held in the corrected position by the post-operative dressing in the first week, by an orthosis (spacer) in the following two or three weeks.

This technique cannot be performed without **specific instrumentation**.

This surgery is only indicated for a **primary congenital deformity**, without arthrosis, where the 1st metatarso-phalangeal articulation is congruent (pathological OMM angle > 7°) and the varus metatarsal angle is less than or equal to 16°.



Positioning of the patient and use of mini-fluoroscope (Mini C arm)

Patient positioning

Because an image intensifier must be used to monitor osseous procedures and adjust osteotomies, the patient needs to be positioned as follows:

- in the strict dorsal decubitus position,
- with the operated foot extending beyond the edge of the table,
- with the opposite foot on a support with the knee bent.

The fluoroscope is positioned at the side of the operated foot.



1st mini_incision

1st step : reduction of the medial prominence of the head and the Reverdin-Isham osteotomy

Using a Beaver surgical knife (handle tor Beaver surgical knite - ref. 254 327 / 3mm Beaver blade - ref. 266 354), make an incision antero medial to the M1 head directed towards the medial eminence.

First step (continued)

Using a "windshield wiper" action in contact with the bone creates a working space, which can be expanded by using an elevator (**Elevator - ref: 258 160**).

Wedge burr is placed into contact with the bone and makes it possible to shave, step by step, the medial part of the head. The burr is selected according to bone quality and the extent of the desired metatarsal correction.

(**Wedge burr 3.1 x13mm - ref: 256 016** ou **Fraise Wedge 4.1x13mm - ref: 256 017**).

The burrs must be used with great care bearing in mind one golden rule: the rotation rate should be kept as low as possible, between 1,500 and 8,000 rotations/minute maximum (use of a torque reducer is highly recommended). An unduly high rotation rate may burn the soft tissues and damage the bone.

Resection stops at the base of the functional articular surface. This must be strictly monitored by both palpation and radiography.

At the end the bone debris is removed by manual pressure and by using the specially adapted rasps.

(**Rasp width 1,5mm - ref: 258 158 / rasp width 3mm - ref: 258 159**).

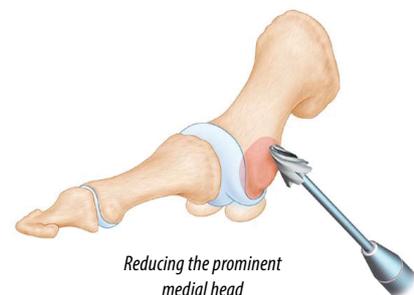
The Wedge burr is replaced by a straight osteotomy burr (**Shannon Straight burr 2,0x12mm - ref: 256 018** or **Shannon Long burr 2,0x12mm - ref: 256 020** - if greater corrective angulation is necessary) positioned via the same incision to contact the side of the bone at 45° angulation, with the tip of the burr at the top of the joint, slopping towards the back of the sesamoids.

The REVEROIN-ISHAM osteotomy is performed parallel to the joint surface in the frontal plane and at 45° in the sagittal plane, from dorsal distal to plantar proximal. It is incomplete, leaving a lateral hinge, correcting the OMM and effecting a slight derotation (or "variation" to be more precise) of the head. It is held in place manually by bringing P1 into adduction and slight plantar flexion.

2nd step: lateral release

Through a 2nd incision made dorsolaterally to the metatarso-phalangeal joint and just to the side of the extensor tendon, a Beaver blade (**Handle for Beaver surgical knife - ref: 254 327 / 3mm Beaver blade - ref: 266 354**) is introduced initially parallel to the lateral side of the joint. This is medially rotated thin 90° to enter the joint at mid-height. Cutting laterally releases the capsule and tenotomises the adductor of the 1st ray, permitting straight forward realignment of P1 onto the M1 head.

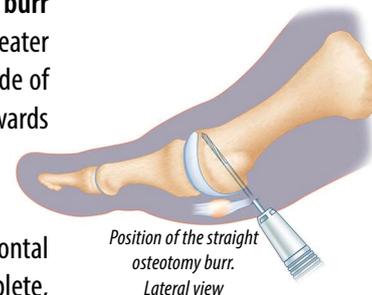
Fluoroscopy can be used to ensure that correction is complete by mobilising the toe into varus. The lateral sesamoid must remain under M1 head.



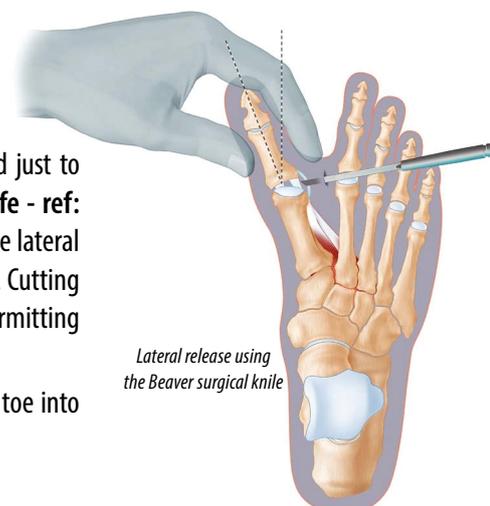
Reducing the prominent medial head



Manual expression by hand of the bone slurry produced during the step 1



Position of the straight osteotomy burr. Lateral view



Lateral release using the Beaver surgical knife



Use of fluoroscopy to monitor the position of the rasp in the metaphyseal zone

3rd step : the Akin phalangeal osteotomy

Using a third approach, made dorsomedially to the proximal third of the P1 metaphysis and parallel to the bone, the Beaver blade (**Handle for Beaver surgical knife - ref: 254 327 / Beaver blade - ref: 266 354**) enters just medial to the extensor tendon running along the bone. It is replaced by the raspatory (**Raspatory - ref: 258 160**) which makes it possible to pass under the periosteum. During this step it is important to monitor the position of the instruments using fluoroscopy.

The straight osteotomy burr (**Shannon Straight burr 2,0x12mm - ref: 256 018**) replaces the raspatory (**Raspatory - ref: 258 160**), to perform the osteotomy at the base of P1.

It is held in place by the fingers while monitoring, if possible, the absence of any springiness in the hinge.

Akin phalangeal osteotomy



Closure

Each incision is closed, using either an absorbable or non-absorbable suture. The dressing is applied in a figure eight to hold the osteotomies in place. It remains for 8 days.



Applying the dressing



Use of fluoroscopy to ensure that the osteotomies are properly closed

Post-operative management

In vast majority of cases, surgery can be performed on an out-patient basis:

- with the patient returning home the same day,
- with a surgical shoe with a stiff sole which is worn for 1 to 3 weeks.

Full weight-bearing is allowed from the start, but it is important to organise rest periods with the foot elevated.

> The patient is seen again on day 8:

- the dressing is removed,
- non-absorbable sutures can be removed.
- a silicon orthotic spacer is made by the surgeon or podiatrist. This is worn for a maximum of 2 weeks. Radiographie follow-up is then performed with the spacer in position. The patient leaves with a transverse metatarsal arch, which is supported by a cohesive elastic bandage.
- > The patient re-attends after **one month** for a second radiographic and clinical assessment, this time performed under loading and without the spacer; the post-operative shoe having been replaced two weeks earlier by a flexible sports type shoe.
- > The patient attends again between **three to four months** for final radiographic and clinical assessment. The timing of later follow-up varies, but is generally performed annually.



Result after 8 days with the spacer in place



Radiographic follow-up at 8 days

Optional associated procedures

Additional procedures on the lateral rays of the foot and/or lesser toes can be performed using similar techniques, such as:

> **2, 3 or even 4 recession osteotomies of the metatarsal heads:**

- EQUIPMENT:
- handle for Beaver surgical knife - ref: 254 327 / Beaver blade 1 or 3mm- réf : 266 354 - 264 259
 - Shannon Straight burr 2,0x12mm - ref: 256 018
 - elevator - ref: 258 160
 - raspatory - ref: 258 160

> **Multiple tenotomies and capsulotomies of the lesser toes:**

- EQUIPMENT:
- handle for Beaver surgical knife - ref: 254 327 / Beaver blade 1mm - ref: 264 259

> **Multiple osteotomies of the lesser toes:**

- EQUIPMENT:
- Shannon Shot burr 2.0x08mm - ref: 256 019
 - handle for Beaver surgical knife - ref: 254 327 / Beaver blade 1mm - ref: 264 259
 - elevator - ref: 258 160
 - raspatory - ref: 258 160