BOLD®

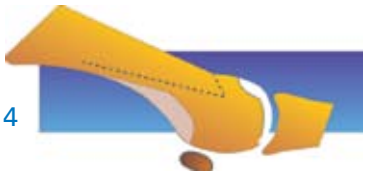
COMPRESSION SCREW

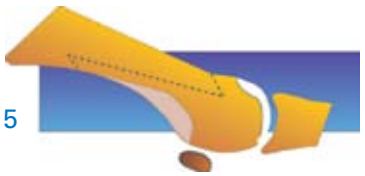
SURGICAL TECHNIQUE

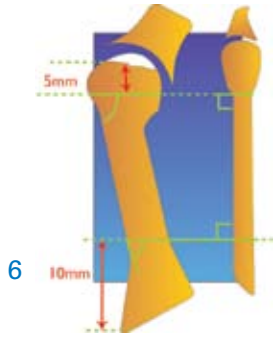
LOWER EXTREMITY SOLUTIONS

INTEGRA™
Extremity Reconstruction

Surgical Technique







As the manufacturer of this device, Integra does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.

SCARF OSTEOTOMY

The Scarf osteotomy consists of a horizontal cut and two transversal cuts of the first metatarsal, allowing for a broad range of angular corrections.

THE DIFFERENT CUTS

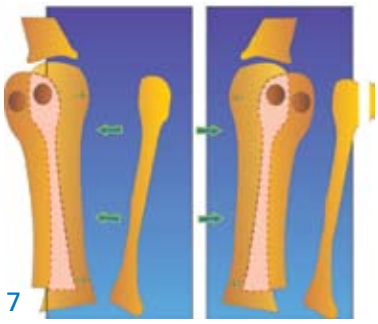
- First, a medial capsulotomy and a lateral release is performed (1). An inter-articular or inter-metatarsal approach is advised. The lateral sesamoid bone is dissected free by making a longitudinal incision between the lateral sesamoid and the lateral suspensory collateral ligament. This incision is extended anteriorly and the adductor hallucis is released from its phalangeal insertion. This way, after lateral displacement of the metatarsal fragment, the sesamoids will be placed under the metatarsal head (2).

- The exostosectomy should be as minimal as possible. The longitudinal resection is performed in alignment of the medial aspect of the metatarsal shaft. The proximal midplantar dissection provides a quasi complete exposure of the midplantar margin and the plantar surface. This view is essential for the realization of the Scarf osteotomy. The longitudinal cut is performed parallel to the medial border as well as to the plantar surface (3).

- The transversal cuts are chevron like cuts (45° angle with the longitudinal cut), which are perpendicular to the second metatarsal (slightly backwards) (4 & 5). The dorsal aspect of the distal transversal cut should be 5 mm proximal to the cartilage. The proximal transversal cut is realized at 10 mm distance from the cuneo metatarsal joint (6).

DISPLACEMENT POSSIBILITIES

- The scarf allows:
  - Medial and lateral translations (7).
  - The P.A.S.A. or D.M.A.A. correction (8).
  - The lowering of the metatarsal head (9).
  - Elevation of the metatarsal head (10).
  - Shortening of the first metatarsal.
  - Lengthening of the first metatarsal (11).



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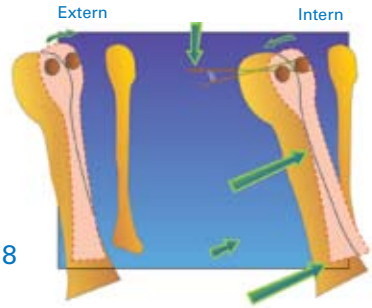

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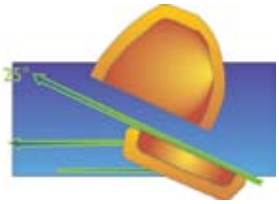
P.A.S.A. correction



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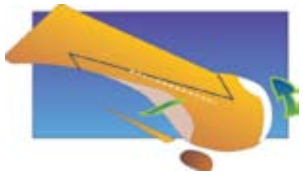

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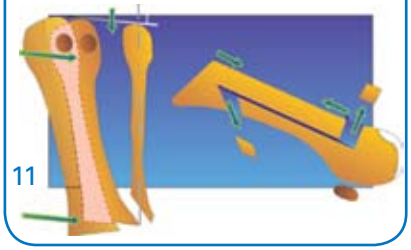

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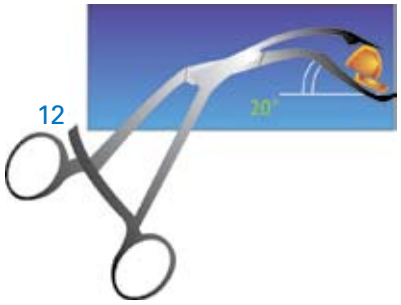

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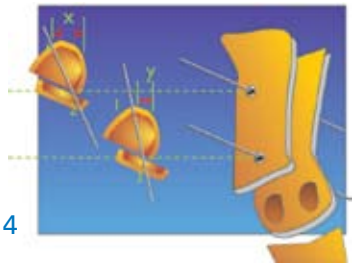

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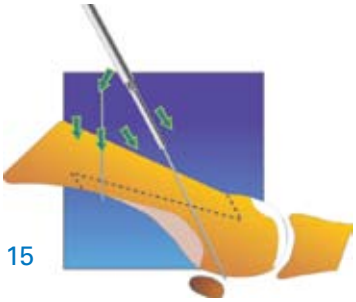

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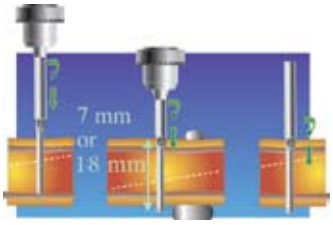
DISPLACEMENT AND DRILLING

- The stabilization of the bone fragments is accomplished with a specific bone clamp. The clamp is designed to allow compression with variable lateral displacement (12).

- The clamp can remain in position while the 1mm K-wires are positioned (13).

- The positioning of the K-wires should be performed while taking into consideration the following :
  - The proximal K-wire should enter the dorsal fragment from medio dorsal to latero plantar. This way, the lateral sagittal beam is respected.
  - The distal K-wire (less oblique than the proximal one), is positioned so that it enters at the midsection of the dorsal fragment in order to transfix the plantarfragment dorso-plantarly (bi-cortical) or obliquely (mono cortical fixation) (14).

- In order to prepare the drill holes for the screw setting, a specific «2 in 1» drill is used. This cannulated drill is used with the K-wires remaining in place. The distal part of the drill (2.2 mm diameter) is adapted to the body of the screw whereas the proximal part of the drill (3.0 mm diameter) is designed specially to countersink the head. The total length of the drill (18 mm) allows an overall use of the drill in most of the metatarsals (15).



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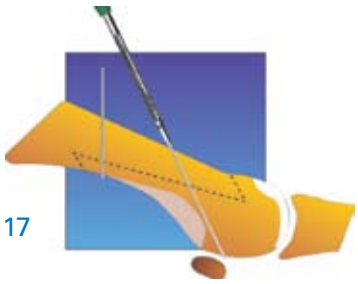
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SCREWS SETTING

- The surgeon will use the drill in order to prepare the two holes (16).

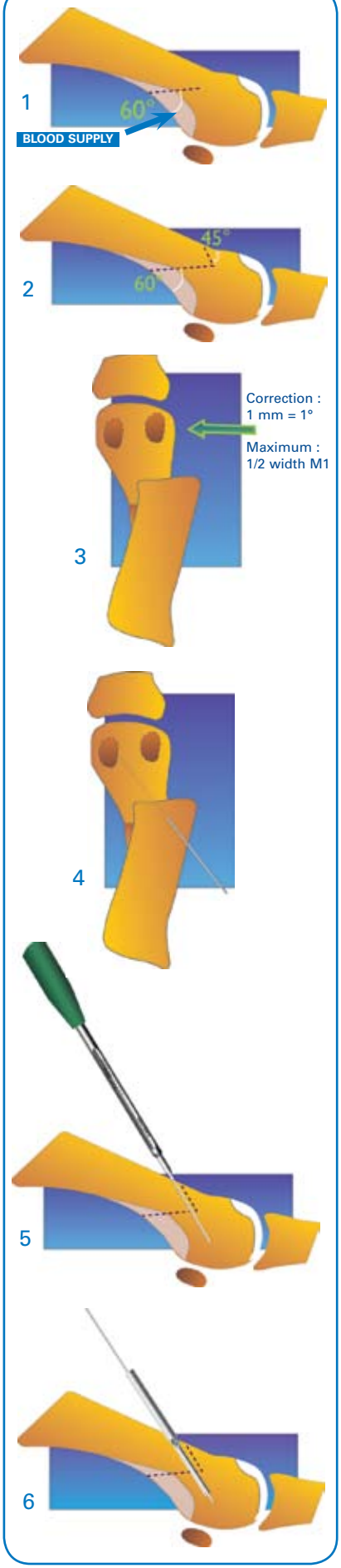
- Before drilling, once the K-wires are positioned, the length of the screws is measured by using the cannulated measurer screwdriver. The cannulated measurer screwdriver can be applied so that immediate reading of the length to implant can be done. As the screw is implanted dorso plantarly in order to achieve a bicortical compression, 2 mm will be added to the measured length. In the event of monocortical (oblique fixation in the metatarsal head) fixation, 2 mm will be deducted in order to avoid penetration into the cartilage (17).

- Once the drill holes are performed, the BOLD® screws are implanted with the measurer cannulated BOLD hex screwdriver of 2.5 mm (18).

FINALIZATION

- In order to avoid soft-tissue interference, care should be taken to countersink completely the screw head (19).

- Finally, the medial «bone-eminence», created due to the displacement of the bone fragments, is resected (20).



CHEVRON OSTEOTOMY

The Austin/Chevron osteotomy is a V-type distal osteotomy of the first metatarsal. This osteotomy is performed in order to treat moderate hallux valgus deformities.

PRINCIPLES OF THE AUSTIN OSTEOTOMY

- The plantar cut is performed at a 60° angle towards the metatarsal base, with the center of the M1 head to be considered as the apex. The cut should be stopped back from the blood supply, in order to preserve the plantar vascularization (1).

- The dorsal cut is identical to the dorsal transversal scarf cut. It is at a 45° angle towards the dorsal cortex, joining the center of the M1 head as the apex (2).

- The Chevron osteotomy allows a displacement which is equivalent to half the width of the metatarsal head. Should the displacement be more than 50% of the metatarsal width, the stability of the bone fragment, required for good bone healing, can be compromised (3).

MEASURING AND DRILLING

- Once the displacement is achieved, a 1 mm diameter, 7 cm long K-wire is inserted. Care should be taken not to pass through the cartilage. The K-wire will guide the screw. Due to atraumatic aspects of a K-wire, it can be withdrawn and replaced until perfect positioning is achieved (4).

- The length of the screw is defined by the measurer cannulated screwdriver (5).

- The drilling in the bone is performed with the «2 in 1» drill. The dorsal cortex has to be completely countersunk by using the enlarged cutting edge tapered level of the «2 in 1» drill (6).

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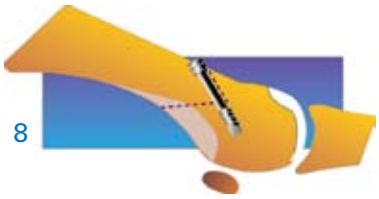

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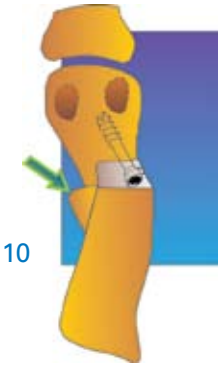

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SCREWS SETTING

- The screw is placed and screwed with the measurer cannulated screwdriver (7).

- The head of the screw is completely embedded in the dorsal cortex in order to avoid soft tissue problems (8).

- The remaining edge, due to the lateral displacement of the head, is removed in order to avoid problems with shoe wear (9). This removed wedge can be used as a lateral graft to improve bone healing (10).

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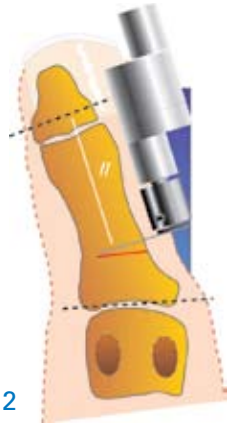

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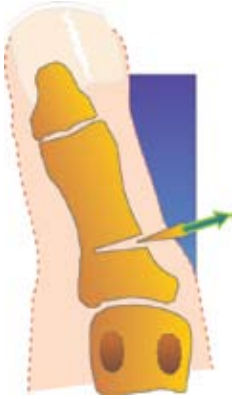

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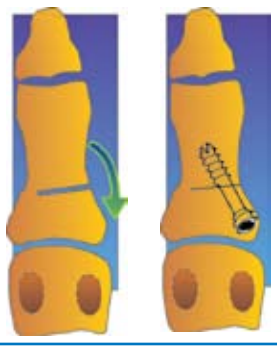

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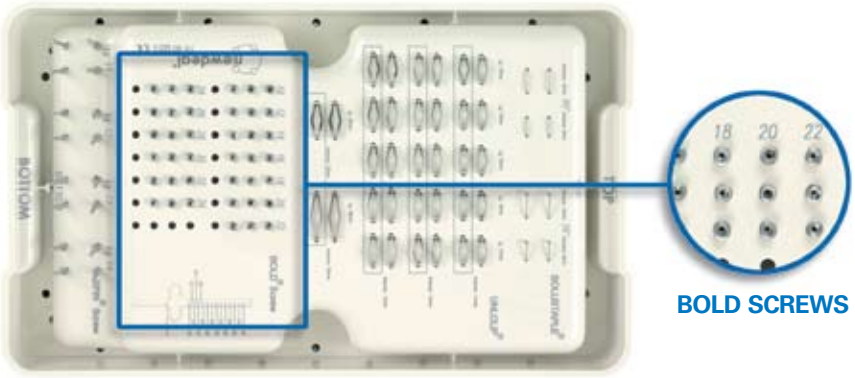
AKIN

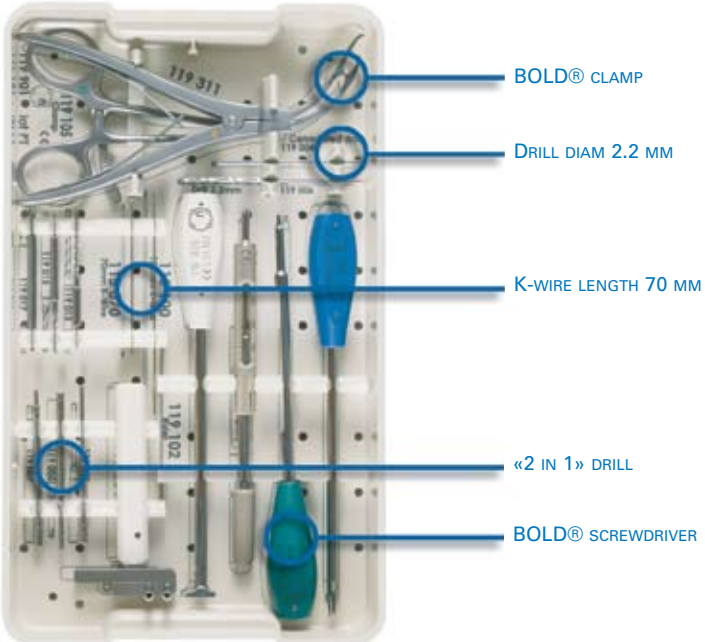
The Akin osteotomy is a medial closing wedge osteotomy performed at the level of the proximal phalangeal base. This will result in a variation of the proximal phalanx. The procedure is always performed with a definitive hallux valgus correction.

THE AKIN TECHNIQUE

- The proximal cut will be performed parallel to the metatarso - phalangeal joint line (1). The distal cut will be performed parallel to the nailbed of the great toe (2). The lateral cortex is kept intact.
- The medial wedge is removed (3).
- The closing technique is performed by surgical reduction.
- The BOLD screw is placed in order to achieve compression of the bone fragments (4).

FOREFOOT SET





BOLD®
COMPRESSION SCREW

BOLD Diam. 3.0mm Compression Screw

Catalog Number	Length	Catalog Number	Length
111 010ND	10 mm	111 022ND	22 mm
111 012ND	12 mm	111 024ND	24 mm
111 014ND	14 mm	111 026ND	26 mm
111 016ND	16 mm	111 028ND	28 mm
111 018ND	18 mm	111 030ND	30 mm
111 020ND	20 mm	111 032ND	32 mm
		111 034ND	34 mm

Instrumentation

Catalog Number	Description
115 070ND	K-Wire length 70 mm
119 103ND	Cannulated measurer screwdriver
119 105ND	Bold clamp
119 004ND	Cannulated drill diam. 2.2 mm
119 005ND	«2 in 1» drill length 18 mm

Accessories

Catalog Number	Description
119 007ND	«2 in 1» drill length 07 mm
119 003ND	«2 in 1» drill length 28 mm
119 013ND	«2 in 1» drill non cannulated length 28 mm
119 015ND	«2 in 1» drill non cannulated length 18 mm
119 017ND	«2 in 1» drill non cannulated length 07 mm

- The products are manufactured and referenced within the frame of the standards in force.
- Implantation procedures are described in the surgical technique.
- WARNING: Federal law (USA) restricts this device to sale by or on the order of a physician.

INTEGRA™
Extremity Reconstruction

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