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MADE IN **SPAIN**



STAPLE

FIXATION SYSTEM

Surgical Technique

Fixation System: Staples

TRAUMA

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The Surgival ***Staple Fixation System***

consists of American Staples for ligaments, H. Ros Staples, Blount Staples and Osteotomy Staple-stepped.

Indications



American Staple for ligaments



American Staple for ligaments without spikes

American Staples for ligaments:

are indicated in patients with avulsed ligaments.



H. Ros Staple

H. Ros Staples:

are indicated for small fragment bone fractures of the foot and ankle.



Blount Staple

Blount Staples:

are indicated in children and adolescents requiring bone growth arrest in the lower limbs.



Osteotomy staple-stepped



Coventry Osteotomy staple-stepped

Osteotomy staple-stepped:

are indicated for tibial osteotomy in patients with varus-valgus deformity.

Contraindications

- Local or general infection.
- Pathological conditions of the bone that may affect the ability to securely attach the implant.
- Pathological changes in the soft tissue connected to the bone that may prevent secure attachment.
- Physical conditions that would prevent adequate implant support or delay healing, such as obstruction of blood supply, insufficient quality or quantity of bone, previous infection.
- Mental conditions that would prevent cooperation during rehabilitation.

Surgical Technique
Staple Fixation System

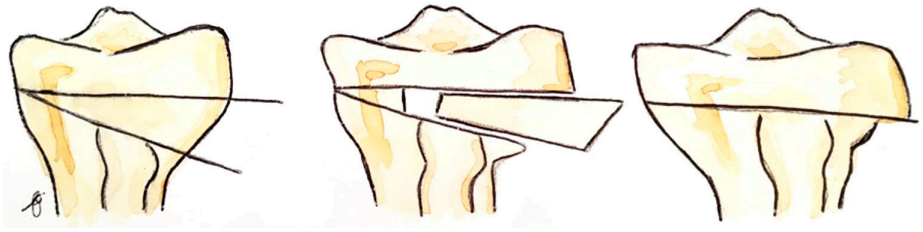
This publication provides, as a example, detailed best practices and guidelines that you should follow for using Surgival osteotomy staples and its dedicated instruments. However, for each staple type, the surgeon must consider the specific indication and instruments required, special needs of each patient and make appropriate adjustments when necessary and as appropriate.

0 Surgical principles and objectives

The OSTEOTOMY is a Surgical procedure to realign a bone in order to change the biomechanics and the force transmission through a joint.

It must be performed by surgeons knowing the extremely high accuracy level requiered, to provide biological enviroments for rapid and effective healing.

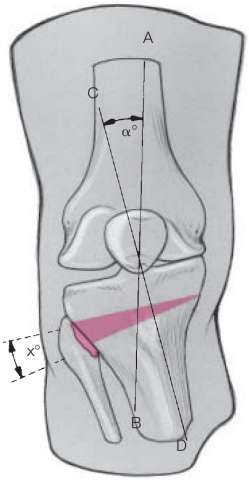
The osteotomy covered by these staples must be the "closed or opened wedge" for long bones. The purpose of this osteotomy will be realign the wrong biomechanical axis to allow the limb to transmit the load properly.



1 Preoperatory Work up

The following radiographs are taken:

· single joint stance (one leg) weight bearing – anteroposterior (AP) view of the knee;



· abduction stress film – AP view;

· lateral view;

· patellar views to determine the state of patellofemoral compartment only in patients with clinical evidence of patellofemoral arthritis.

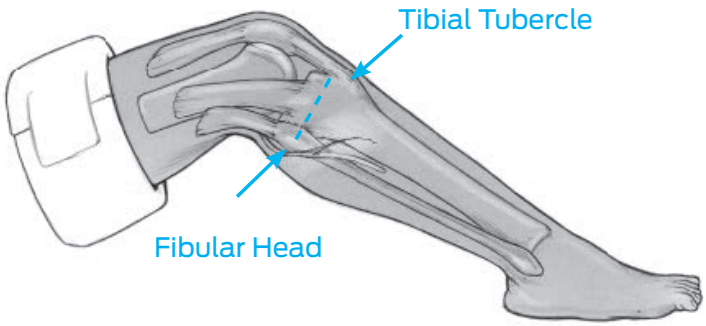
The tibio-femoral angle is calculated on the weight bearing AP view.

The desired correction will be stablished by the surgeon based on the pre-operatory study where will be identified the realigment of the joint and reinstated the biomechanic axis to transmit correctly the load.

2 Patient preparation and approach

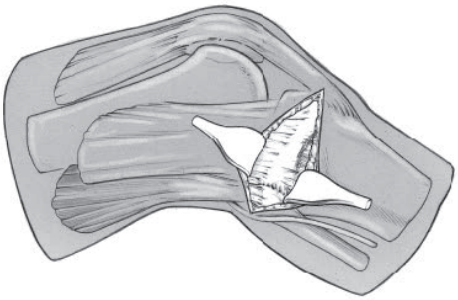
The patient is positioned supine with a sandbag under the hip on the affected side. Free leg draping. The pneumatic tourniquet is inflated after elevation of the lower limb and exsanguination.

The knee is kept in flexion up to 90º during surgery so that the common peroneal nerve, the lateral collateral ligament and the popliteal structures slacken and stay away from the operative site. Transverse lateral skin incision, from the fibular head to the tibial tubercle.

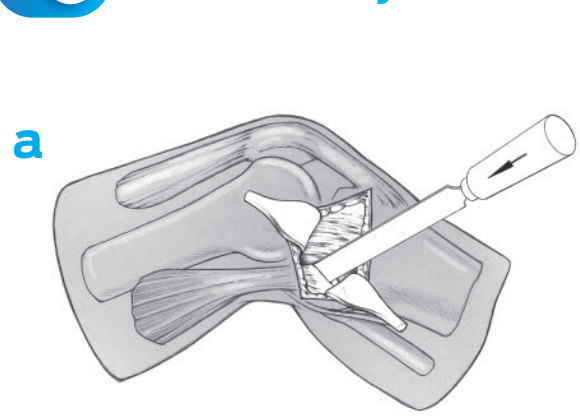


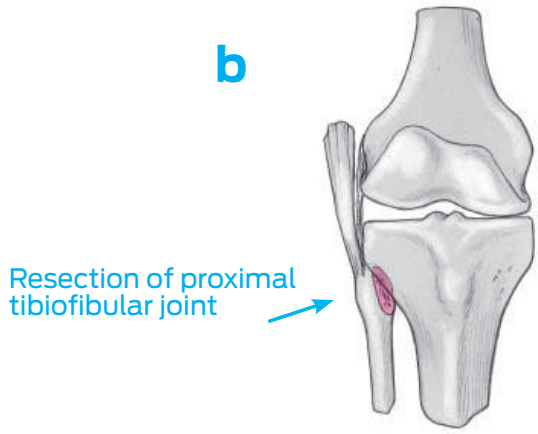
Subcutaneous tissue and fascia are incised in the same plane, and the superior tibiofibular joint is exposed.

Anteriorly, the dissection extends proximal to the tibial tuberosity. The common peroneal nerve and the fibular collateral ligament are not exposed.



3 Osteotomy

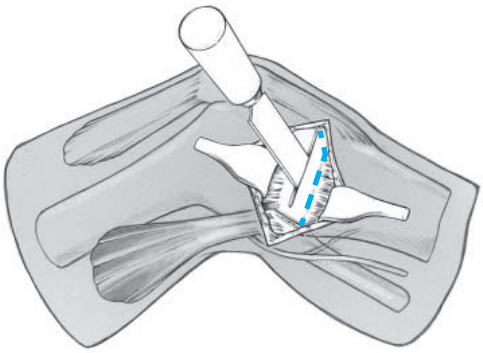


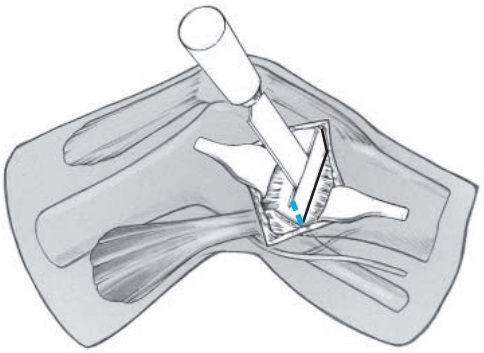


The anteroinferior part of the fibular head is osteotomized and resected (a), and the proximal tibiofibular joint is resected (b). The fibular collateral ligament is spared.

The tibial lateral cortex is exposed subperiosteally and the tibial metaphysis freed by sharp dissection for about three quarters of its circumference. The patellar tendon is retracted, and the osteotomy cuts are marked on the lateral cortex, proximal to the tibial tubercle.

A trapezoid box of appropriate size, its vertical height corresponding to the desired correction in millimeters, is marked. The proximal cut is made parallel to the joint, its position confirmed with the image intensifier. The distal cut tapers towards the medial side.





The two cuts are joined by oblique cuts, retaining an anterior bony ledge with the distal and a posterior ledge with the proximal fragment.

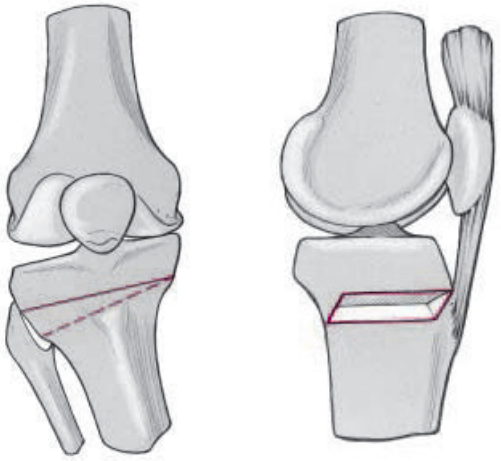
4 Aligment correction

With the knee in full extension a valgus stress is applied in order to have a correct osteoclasis.

Diagrams showing the wedge in the anteroposterior and lateral view.

The ledges help to close the osteotomy like a box, imparting additional stability.

With the intermittent fluoroscopy the medial hinge is checked and the mechanical axis is verified.



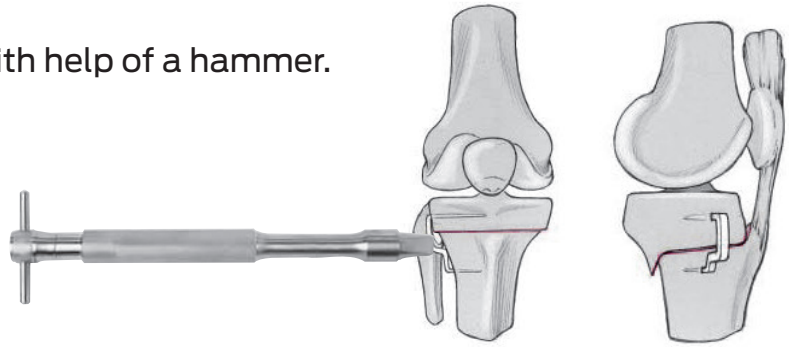
5 Staple impaction

Once achieved the correct alignment, the osteotomy is stabilized with two staples.



· Capture the staple with the impactor:
Spread the clamping jaws by rotating the knob against the casing and insert the selected staple correctly in the
chosen clamping jaws.
Release the pressure on the knob so that the spring-loaded mechanism keeps the staple fixed in the jaws.
Tighten the knob until firm resistance can be felt, confirming secure fixation of the staple in the clamping jaws.

· Impact the staples with help of a hammer.



· After impaction of the staple into the bone, turn the knob anti-clockwise several turns and release the instrument by pushing the knob against the casing.

6 Check position and rotation

Once the tibia is fixated, the integrity of the medial hinge is re-checked fluoroscopically with dynamic images.



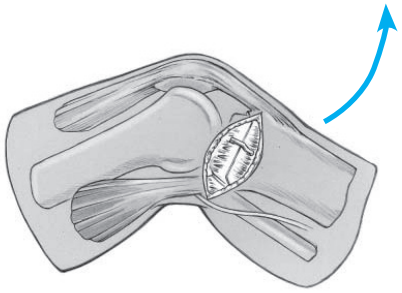
7 Osteotomy reduction

The knee flexion is then reduced while closing the osteotomy.

Note: Care is taken to retract the patellar ligament anteriorly to allow the ledge on the distal fragment to slide over the proximal fragment resulting in an anterior translation of tibial tuberosity.

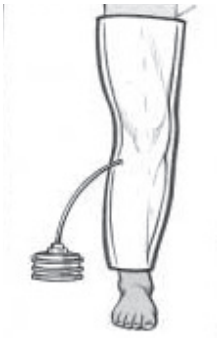
Concomitantly, the posterior ledge slides over the distal fragment like the closing of a lid of a box.

The cancellous bone taken from the osteotomy site is then placed as bone graft over the lateral tibial cortex near the staple.



The tourniquet is deflated and hemostasis achieved. Closure of the wound in layers over a suction drain. A cylinder cast is applied with the knee joint in extension.





8 Postoperatory

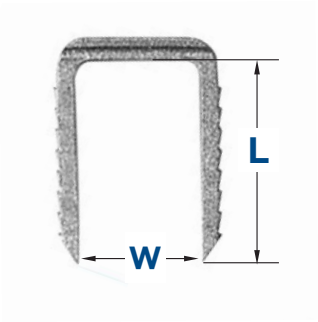
After 24 hours the drainage is removed, a hinged knee brace is positioned and active knee motion can be started as tolerated. This fast return to active mobility reduce the incidence of patella baja.

Antero-posterior and lateral X-Ray is performed 24 hours after surgery and weight bearing AP views and lateral views are obtained after 8 weeks.

For the first 8 weeks we allow touchdown weight bearing with two crutches, followed by progressive full weight bearing.

Reference Catalog
Staple Fixation System

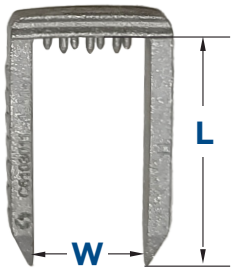
American Staple for ligaments without spikes



Reference	Width "W"	Length "L"
C6103106	6mm	23mm
C6103108	8mm	23mm
C6103111	11mm	23mm
C6103116	16mm	23mm

Material: Chromium Cobalt Molybdenum Alloy (ISO 5832-4)

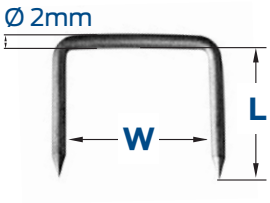
American Staple for ligaments



Reference	Width "W"	Length "L"
C6103006	6mm	23mm
C6103008	8mm	23mm
C6103011	11mm	23mm
C6103016	16mm	23mm

Material: Chromium Cobalt Molybdenum Alloy (ISO 5832-4)

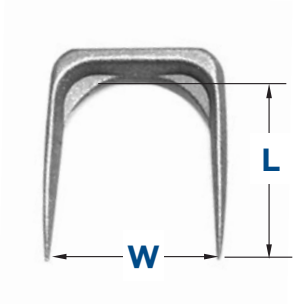
H. Ros Staple



Material: Stainless Steel (ISO 5832-1)

Reference	Width "W"	Length "L"
C6102001	9mm	11mm
F6102004	12mm	12mm
C6102002	16mm	14mm
C6102003	20mm	18mm
C6102004	25mm	18mm
C6102005	29mm	22mm

Blount Staple

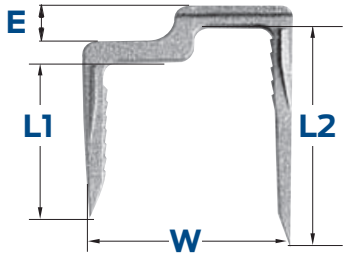


Reference	Width "W"	Length "L"
C6101001	10mm	19mm
C6101002	16mm	19mm
C6101003	22mm	19mm
C6101004	28mm	19mm

Material: Chromium Cobalt Molybdenum Alloy (ISO 5832-4)

IMPLANTS

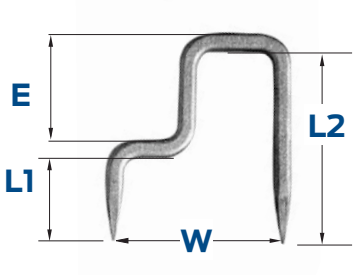
Osteotomy Staple-stepped



Reference	Width "W"	Length "L1"	Length "L2"	Step"E"
C6104001	30mm	22mm	32mm	5mm
C6104002	30mm	22mm	37mm	10mm
C6104003	30mm	22mm	42mm	15mm

Material: Chromium Cobalt Molybdenum Alloy (ISO 5832-4)

Coventry Osteotomy Staple-stepped



Reference	Width "W"	Length "L1"	Length "L2"	Step"E"
C6100001	23mm	22mm	27mm	5mm
C6100002	23mm	17mm	27mm	10mm
C6100003	23mm	12mm	27mm	15mm

Material: Chromium Cobalt Molybdenum Alloy (ISO 5832-4)

INSTRUMENTS

C6105000	Coventry staples impactor	
C6105001	Blount staples impactor	
C6105002	H.Ros staples impactor	
C6105003	Coventry/Blount Staples Impactor Finisher	
C6105004	H.Ros Staples Impactor Finisher	
C6105005	H.Ros Staples Extractor	
C6105006	Coventry/Blount Staples Extractor	
C6105007	Impactor-Extractor for osteotomy and american staples	

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