ARAMIS Reversed and Anatomical

Total shoulder prosthesis—Surgical technique

Sommaire

Note : Blue sentences are technical indications

The manufacturer of this prosthesis, doesn't practice medicine and can't recommend neither this surgical technique nor other techniques in specific cases.
The surgeon has to define the appropriate technique for each patient.
Read carefully the instruction of use.

ARAMIS Shoulder Prosthesis

A unique stem

With a common humeral stem, the prosthesis can be declined in an anatomical or a reversed prosthesis. This allows the surgeon to have a global approach of shoulder arthroplasty.

The stem is cemented (polished) or cementless (coated with titanium and hydroxyapatite).

The choice between an anatomical or a reversed prosthesis can be decided intra operatively and the humeral stem can evolve from one version to another.

Anatomical prosthesis

In order to respect anatomical variations, the stem is available with a CCD (cervico-diaphyseal) angle of 132° or 140°. The eccentric cone of the humeral heads allow an acute anatomical restoration. The mismatch between the humeral head and the glenoid is optimized to ensure long-term fixation.

Reversed prosthesis

The helicoidal blade allows an optimal fixation of the glenoid component in the scapula. The use of 1 to 4 screws completes the baseplate fixation. Secondary fixation is ensured by the titanium and hydroxyapatite coating (possibility of using a baseplate with standard or long peg).

The 38mm glenosphere of diameter 38mm is fixed to the baseplate with an internal screw system that avoids the risk of conflict between the screw and the insert.

The CCD-angle of the reversed version, which was fixed at 155° by Pr. Paul Grammont, was decreased to 140°. This varisation involves a benefic increase of the lever-arm of the deltoid, by a lateralization.

Associated with the optimization of the glenosphere's position, it reduces significantly notch apparition.

The use of a cup with an eccentric cone allow (with the same settings of medial and posterior deport as for the anatomical prosthesis) to reproduce the humeral anatomy and to optimize the center of rotation.

The stability and tensioning of the prosthesis is set and adjusted with 3 insert thicknesses.

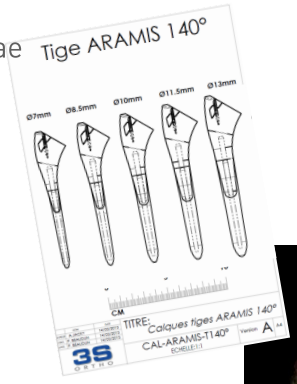
An ergonomic instrument set

The instrument set is reduced. One case only to implant an anatomical or a reversed

Generalities

Indications

- Inflammatory severe artrhopathy or evolved arthrosis for which conservative or alternative treatments have failed or are suitable
- Arthropathy due to a degenerative disease
- Recent traumatism or traumatism sequelae
- Failure of a previous arthroplasty



Pre-operative planning

- Use templates to define component size and positioning

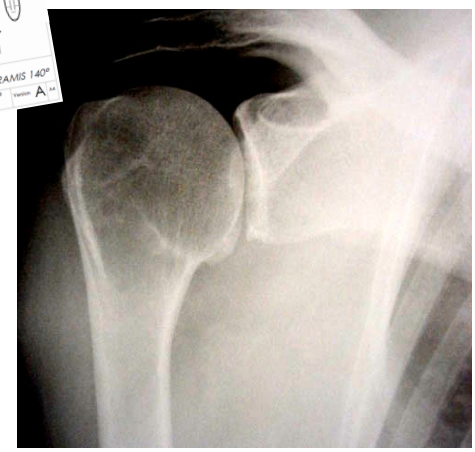


Fig. 1

Patient installation

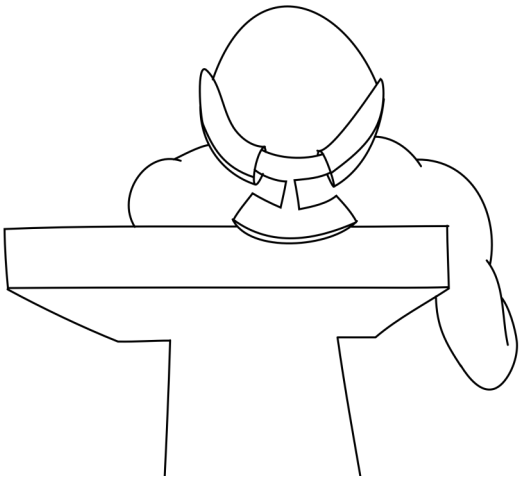


Fig. 2

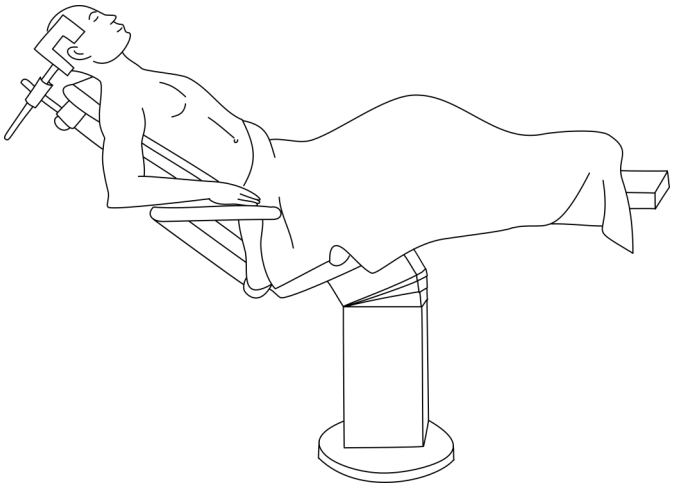


Fig. 3

The patient is sufficiently lateralized on the table :

- To release the posterior shoulder face
- And to put the arm in retropulsion

Deltopectoral approach

Deltopectoral approach

Skin incision begins to the coracoid tip, follows the deltopectoral groove and goes to the deltoidian V (Fig. 4).

Incision is outlying the groove, in its lower part to avoid the flanges of the axillary cavity.

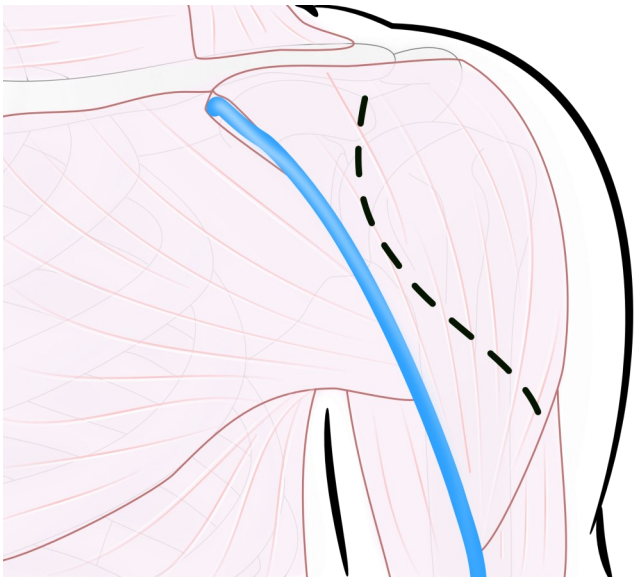


Fig. 4

Retract laterally the cephalic vein (Fig. 5) with the deltoid muscle.

Coagulate or connect the collateral veins present in the vein.

Open the path to the low part of the incision.

Separation between the deltoid and the pectoralis major is clearer in the upper part of the groove, where there is a cellular fat space (Mohrenheim fossa) that has to be exposed medially with a Faraboeuf retractor.

Incision of the clavi pectoro axillary aponeurosis at the lateral side of the conjoint tendon.

Place a self-retaining retractor.

Place a retractor behind the coracoid process.

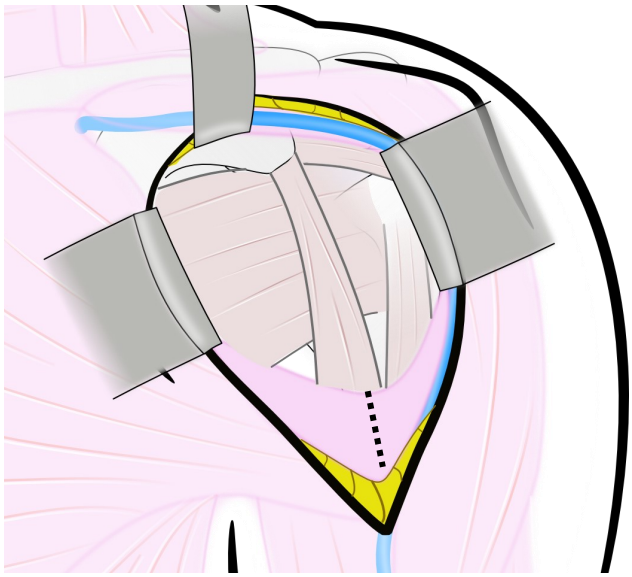


Fig. 5

Deltopectoral approach

Put the arm in abduction and external rotation.
Below, cut partially the pectoralis major tendon on the half of its length (Fig. 6).

Put the arm in abduction and internal rotation.
Locate the long biceps at the lower part of the incision.
If the subscapularis is present, identify the superior part of the tendon and at the lower part, ligature the circonflex vessels (Fig. 7).

The subscapularis tendon can be absent or very degenerative with a difficult anatomical identification; **conserve it.**

- Optional identification of the muculocutaneous nerve.
- Identification of the radial nerve when the arm is in neutral rotation elbow to body in anterior flexion.
- Identification of axillary nerve under the conjoint tendon, in front of the subscapularis up to the inferior side.

On a normal tendon, begin with an horizontal arthrotomy at the superior edge.
Perform a tag suture.
Dissect the tendon and the capsule following the anatomical neck at 15mm within the bicipital groove (Fig. 7).

Leave a tendinous part on the lesser tuberosity or lift the entire tendon with bone chips from the lesser tuberosity.

Save the inferior quarter of the tendon to boost the axillary nerve which passes near.

On a damaged tendon, access to joint is direct through the vertical incised capsule.

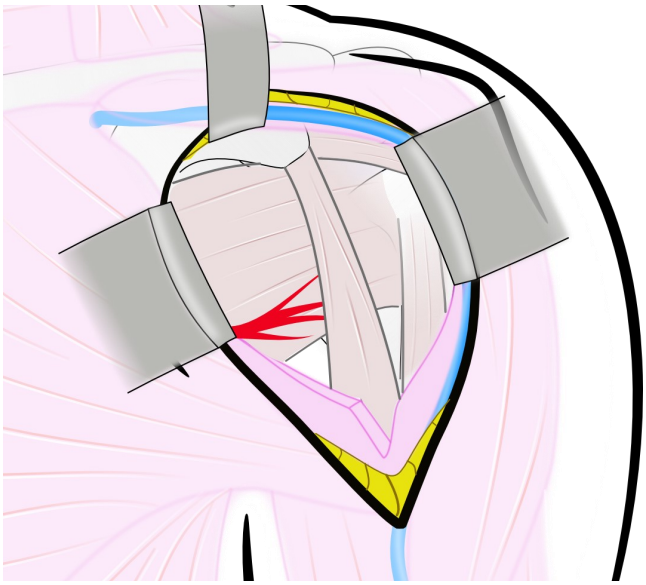


Fig. 6

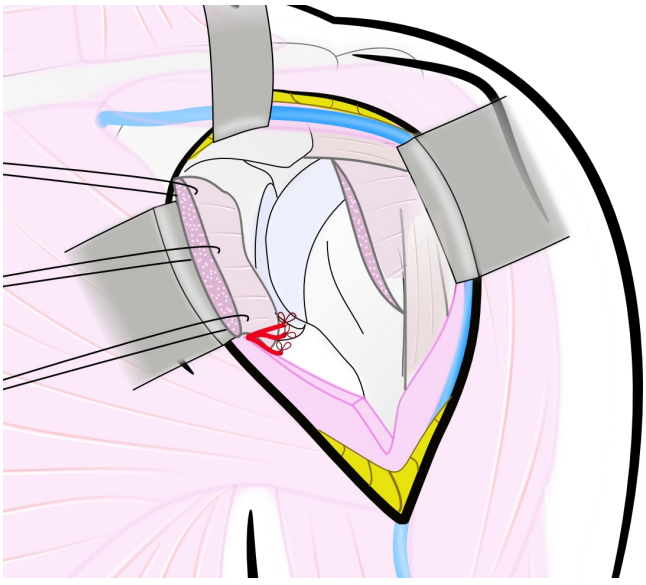


Fig. 7

Deltopectoral approach

Place a Trillat or a Fukuda retractor in the joint (Fig. 8).

Release the tendon and the subscapularis.

Do an anterior then inferior juxta glenoidal capsulotomy.

The inferior capsule release at bone contact is an important step in joint release and facilitates glenoid exposure.

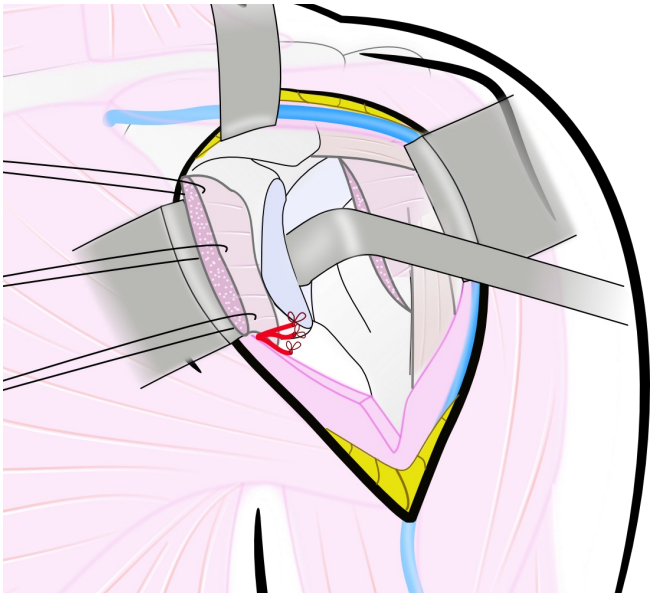


Fig. 8

Dislocation (Fig. 9) has to be done slowly and progressively in abduction, external rotation and retropulsion.

Resect the osteophytes of the anatomical neck with the bone rongeur or with a Lambotte blade.

A retractor is placed behind the head to retract the coraco-biceps.

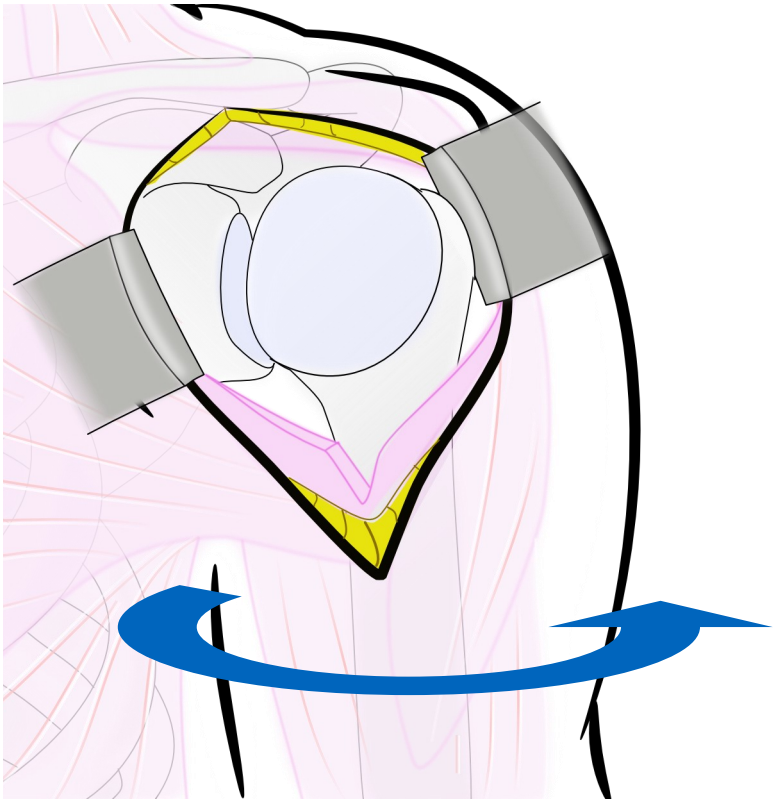
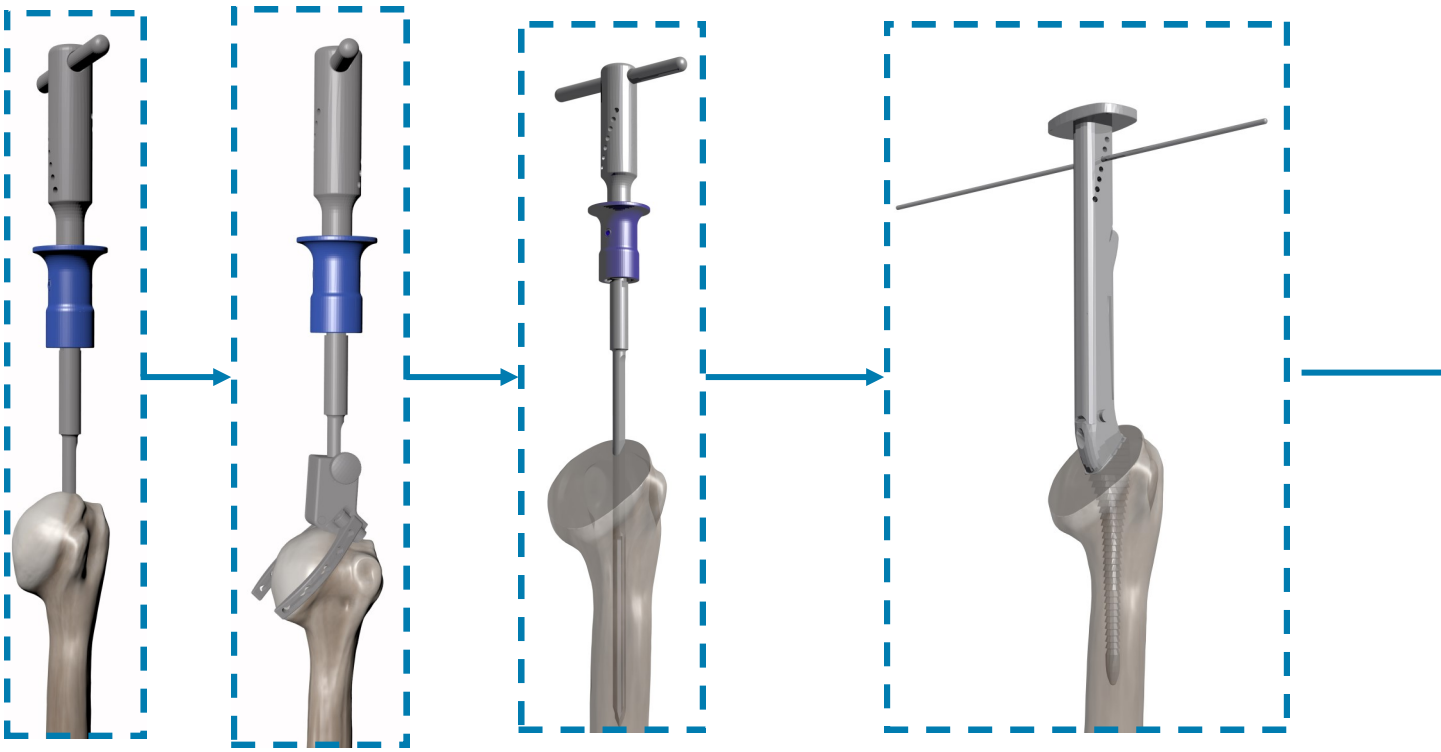


Fig. 9

Synopsis: Anatomical version

HUMERAL PREPARATION



Drill Ø7

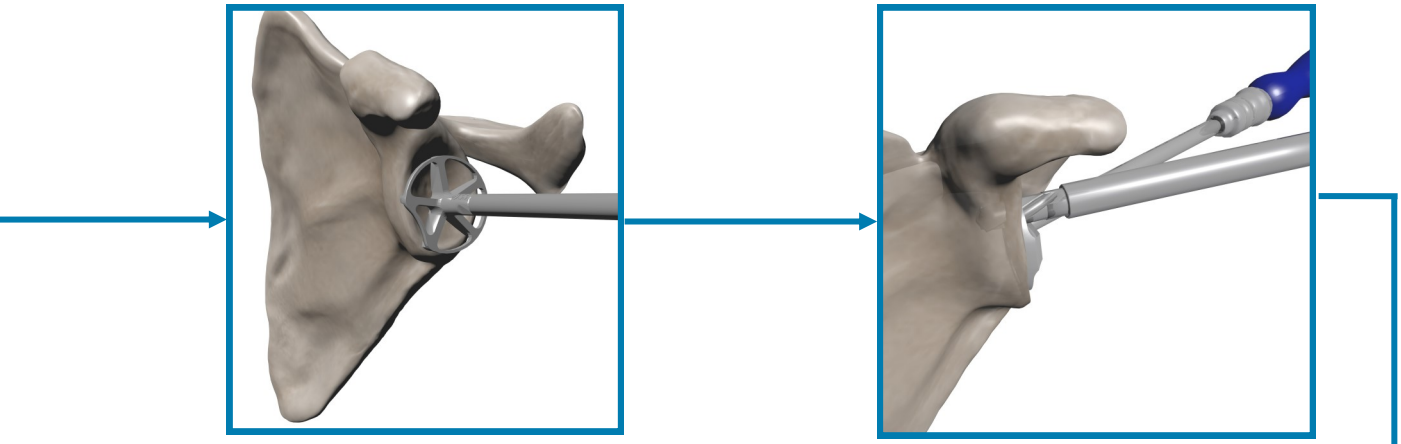
Humeral head resection

Diaphysis calibration

Preparation with retroversion setting

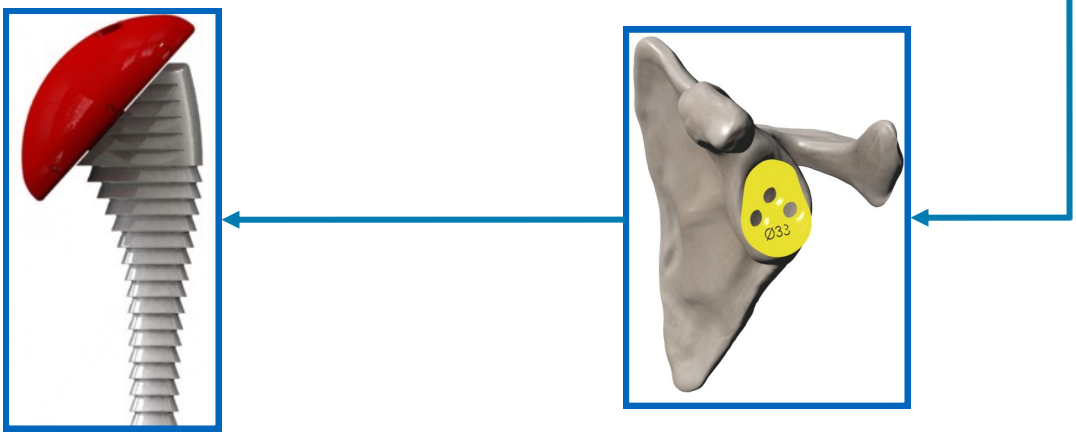
Synopsis: Anatomical version

GLENOID PREPARATION



Glenoid resurfacing

Glenoid peg drilling



Glenoid trialing

Humeral resection

- Introduce the first drill Ø7 on the highest point of the head and in contact with the anatomical neck (Fig. 10).

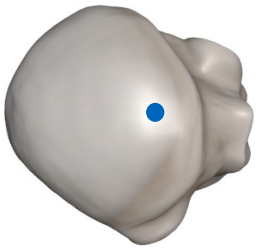


Fig. 10

The entry point is located about 1 cm within and behind the bicipital groove (Fig. 11).

Fig. 11

- Insert the cutting guide in the starter drill Ø7 (Fig.13).
- Place the cutting guide and the drill in the medullary canal until bone contact.
- Fix the height of the cutting guide with the screw. The optimal cutting level corresponds to the anatomical neck line (Fig. 12).

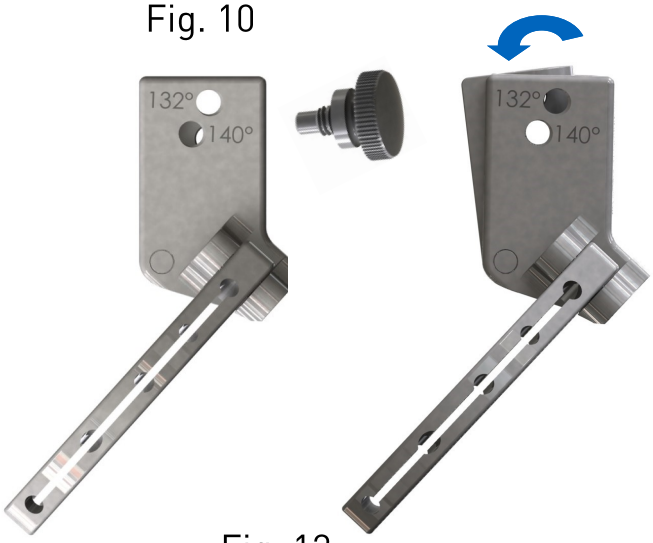


Fig. 12

The cutting guide can be set at 132° or 140°.

- Set the humeral cut height and tighten the roller on the drill flat spot level. The optimal cut level is the anatomical neck line.

Fig. 13

Humeral resection

- Set the desired retroversion in the handle with the orientation stem. It is aligned with the patient's forearm (Fig. 14).

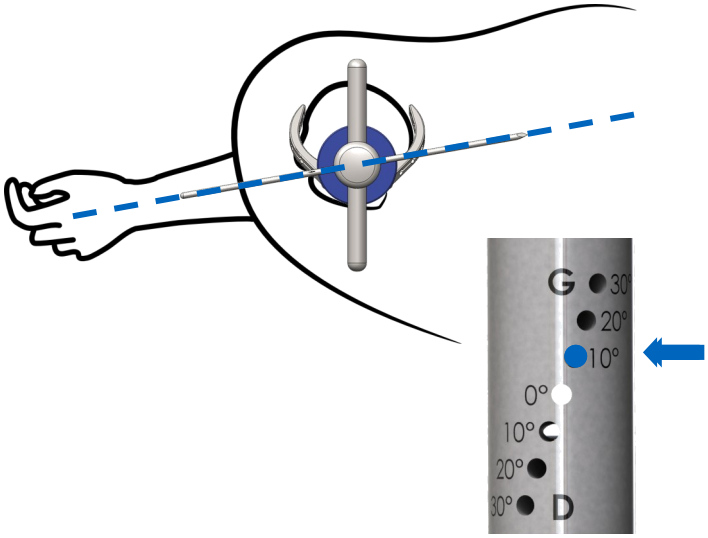


Fig. 14

Indications concerning height : the reference is the anatomical neck line. The resection may be done above (+2.5mm), below (-2.5mm) or in the cutting guide notch (Fig. 15). The resection has to be economic. An excess in resection induces a risk of instability.

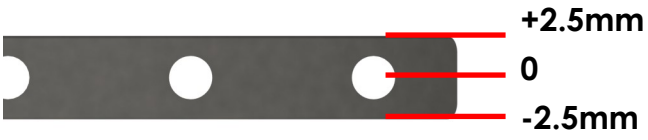


Fig. 15

Restore a natural retroversion. Excessive retroversion may affect stability. An usual retroversion is about 20°.

- The oscillating saw could be fixed by two pins (BNS-025T-100) in order to stabilize the guide. These pins are inserted according to the hole's orientation of the cutting guide. Start the resection in the cutting guide notch or on pins with an oscillating saw (Fig. 16 and 17). Then remove the cutting guide and complete the resection.

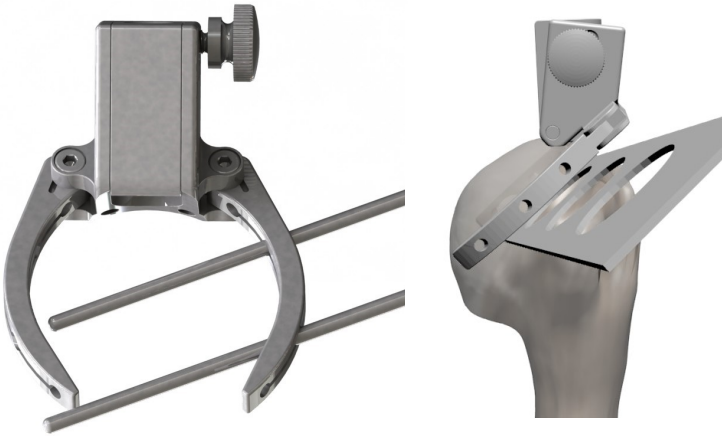


Fig. 16

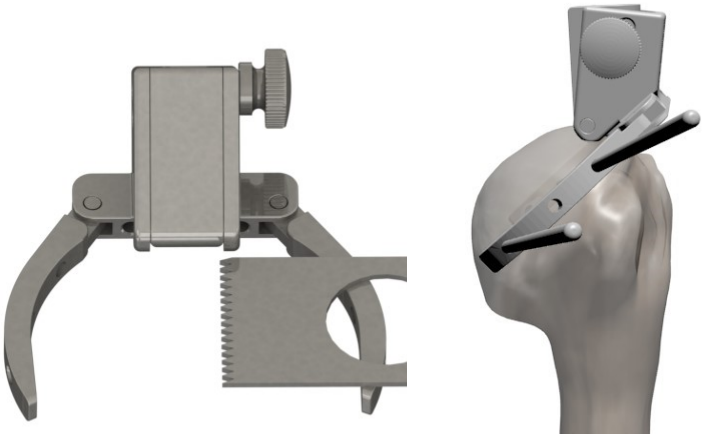


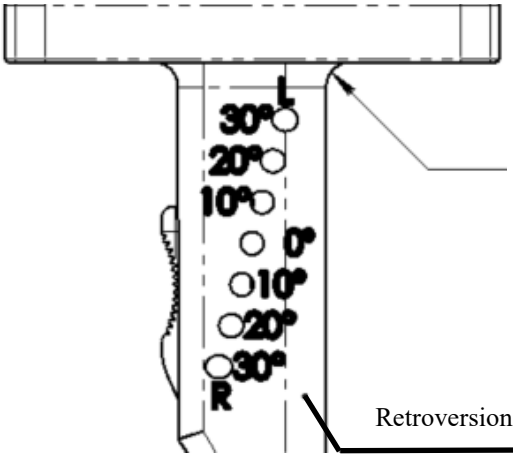
Fig. 17

Humeral preparation

- Identify the cut retroversion with the retroversion plate (EAAPRV0) and with a Lambotte blade (Fig.18).

In the case the humeral bone is very compact, make a bone cylinder equivalent to superior volume of the Ø7mm rasp with the retroversion plate.

- Calibration by increasing diameter of the drill until the optimal filling of the medullary canal (Fig. 19).
- The size of the last drill defines the maximal size of humeral stem. Use the most filling size is not required. Choose the size related to the first stable rasp
- Push the spring in order to fix the rasp on the rasp holder (Fig. 22).
- Once the rasp is set, lock the rasp with the trigger (Fig. 23).
- Reproduce retroversion with the orientation stem on the handle (Fig. 20), en by following the mark previously



made with the retroversion plate.

Start with the smallest grater (Ø 7) and work up from size to size until you have good stability

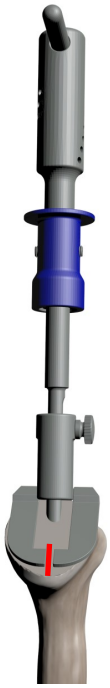


Fig. 18


Fig. 19

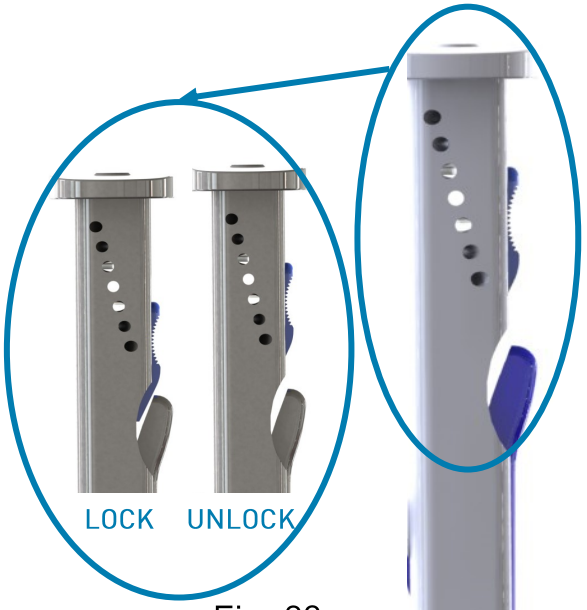


Fig. 23


Fig. 20

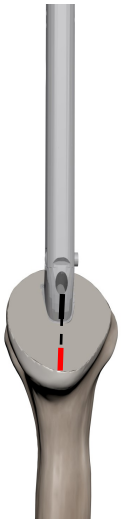


Fig. 21

Fig. 22

Glenoid exposure

- Leave the last rasp in place and remove the rasp holder by pushing the spring.

If necessary, adjust the cut freehand by guiding the saw blade in contact with the superior face of the rasp or the angle corrector (Fig. 24).

If the cut was made at 140° : place the angle corrector on the rasp (Fig. 24).

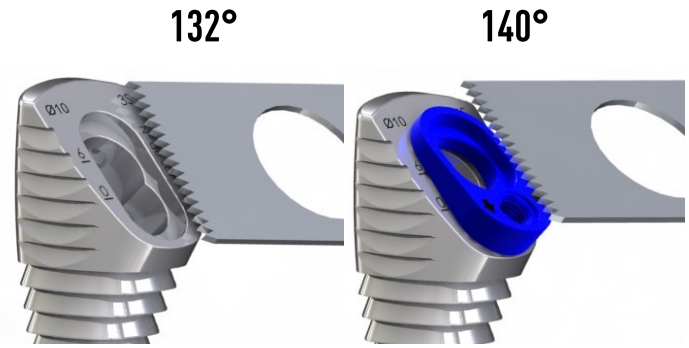


Fig. 24

- Place the humeral protector (Fig. 25) directly on the rasps (cut at 132°) or by using a wedge (cut at 140°).

Fig. 25

Place 3 retractors (Fig. 26):

- One behind the posterior neck of the glenoid in order to push the humerus back
- One at the bottom of the glenoid pillar
- One in front of the subscapular groove.

- Perform a capsulotomy with circumferiential labrum resection, and remove capsular and synovial excess.

The capsulotomy (in particular inferior) allows to push the humeral head in back position from the glenoid, for easier glenoid exposure.

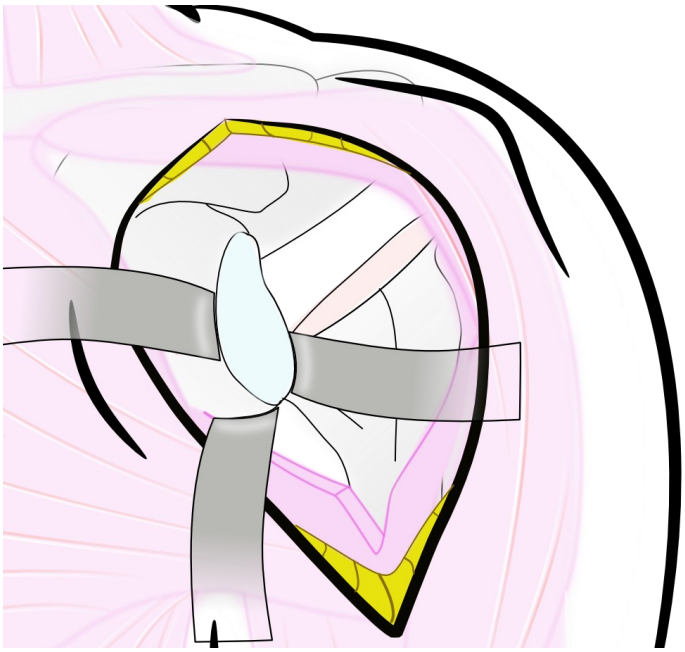


Fig. 26

Glenoid preparation

Screw the ream on its handle and tighten with a flat key (Fig. 27). The assembly can be fixed on a motor by using the « REAM » position. It can also be fixed on the T-handle to ream manually.

Fig. 27

After an eventual resection of the osteophytes, set the threaded pin sterile ref (BS-025F-200) up in the glenoid drill guides (Fig. 28). The pin's orientation must respect the pre-operative planning. Carry out the reaming with adapted reams to glenoid size : : Ø25, Ø30, Ø33 et Ø36mm.

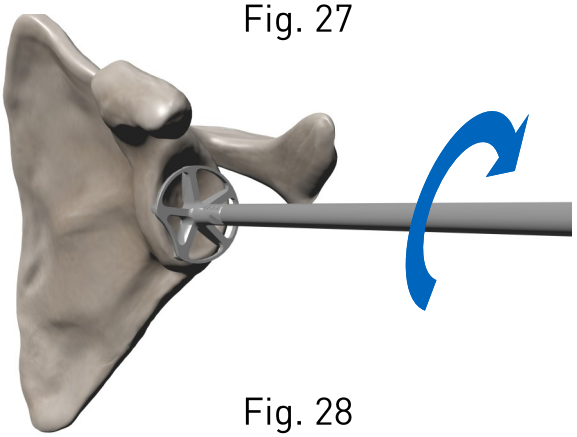


Fig. 28

As a precaution, the manual reaming is preferable. If reaminf : start the motor at few millimeters of the glenoid surface and apply the ream in movement, to avoid that the cutting edges of the ream engage too brutally.

Two drill guides are available (Fig. 29) :

- One for the glenoid Ø30mm
- One for the glenoid Ø33 and 36mm

Use the guide adapted to the glenoid size.

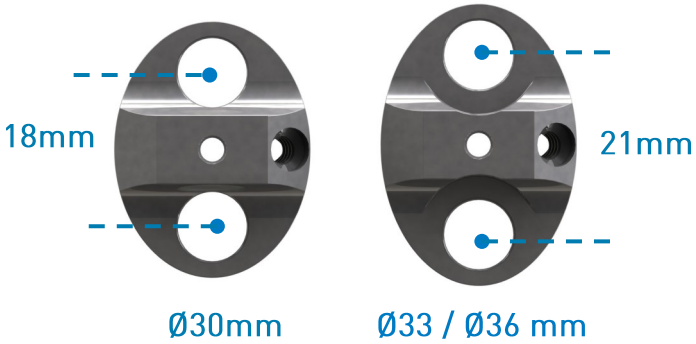


Fig. 29

WARNING : if you use the drill guide with a 18mm-gap you have to use the smallest glenoid component.

Une fois le premier trou réalisé (Fig. 30), y insérer le plot de stabilisation (Fig. 31). Percer le second trou.

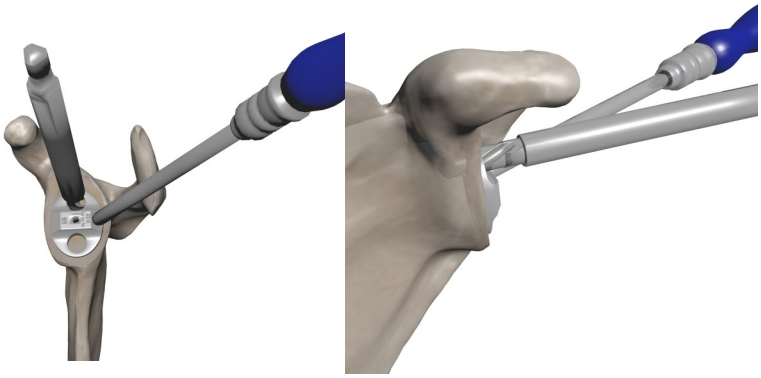


Fig. 30

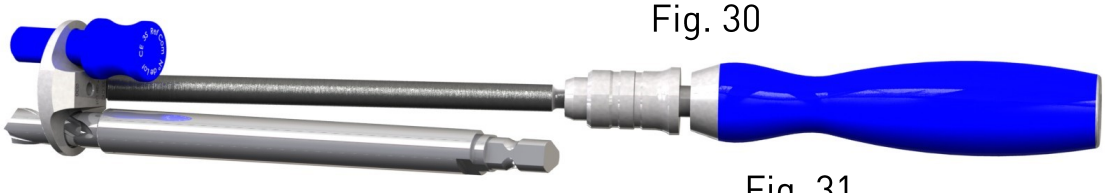


Fig. 31

Trials

Place the glenoid trial (Fig. 35).

- Choose the humeral head size adapted to the resected head. 4 diameters are available : Ø40, 43, 46 and 49mm (Fig. 36).

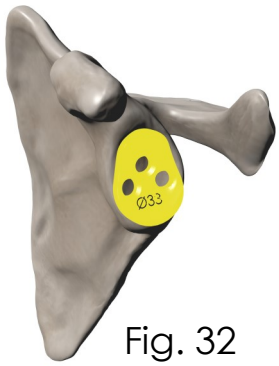


Fig. 32

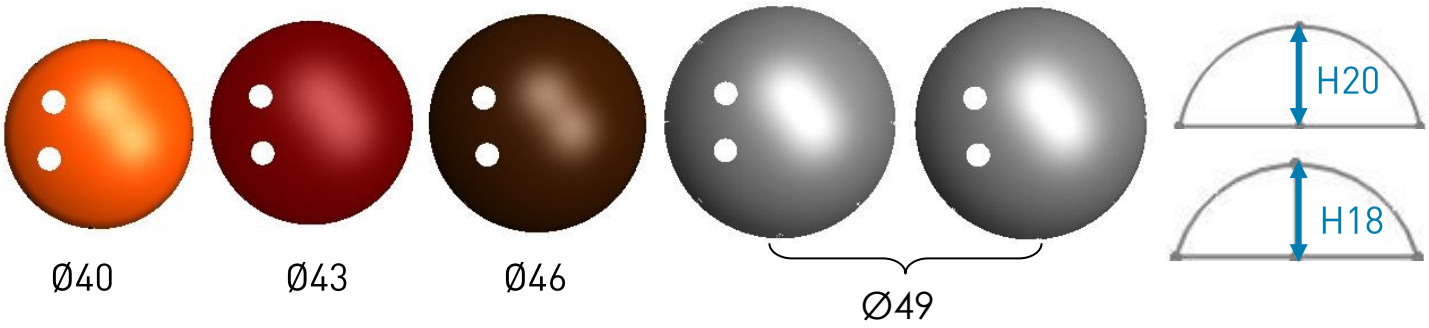


Fig. 33

Cut at 132° = do the trial directly on the rasp

Medial offset setting

Fig. 34

Fig. 35

Cut at 140° = use angle corrector

Medial offset setting

Fig. 36

Be careful always direct the arrows downwards

Fig. 37

Trials

Posterior offset setting :

The posterior offset setting is possible due to the dial system of the eccentric humeral head.

There are 8 different ways to position the humeral head (Fig. 38).

These settings allows to reproduce patient's anatomy and to cover the cut (Fig. 39).

Check that the superior part of the stem (rasp or rasp + angle corrector) is free. Cut again or clean with a bone rongeur if necessary.

Identify the position at the back of the stem (Fig. 40).

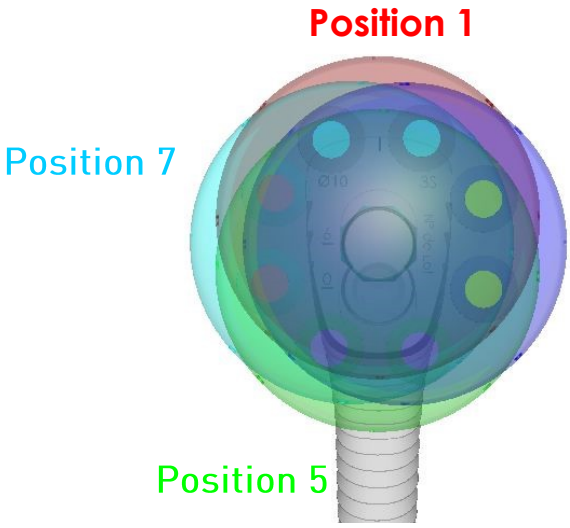


Fig. 38

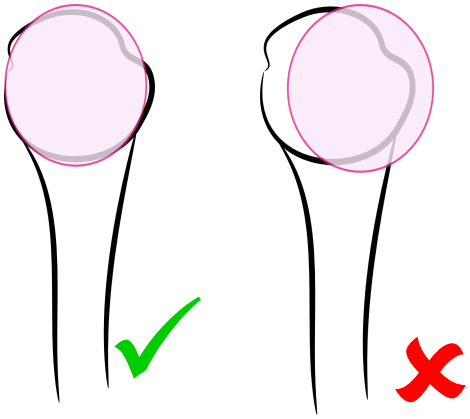


Fig. 39

Fig. 40

Warning : verifiy the compatibility between glenoid component and humeral head

Glenoid	Ø30	Ø33	Ø36	Ø36 R34
Ø40H13	✓	✓	✓	✗
Ø43H15	✓	✓	✓	✗
Ø46H17	✓	✓	✓	✗
Ø49H18	✗	✗	✗	✓
Ø49H20	✗	✗	✗	✓

According to recent studies, a mismatch of 5 to 7mm seems to be a good option.

Final implant positioning

- Remove the trials

- Inject the cement in the two holes, place the final glenoid component with the hand and impact it (Fig. 41).

- Choose the type of stem adapted: EVO, standard cementless or standard cemented

Note :

Avant la mise en place de la tige humérale, mettre en place des fils trans-osseux pour réinsérer le subscapulaire.

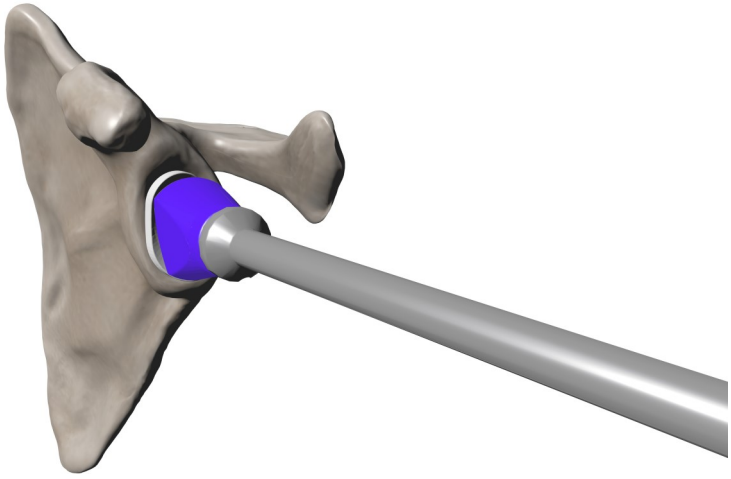


Fig. 41

- Assemble the final stem of the selected model on the rasp-holder and impact it in the humerus while respecting the retroversion previously determined (Fig. 42)

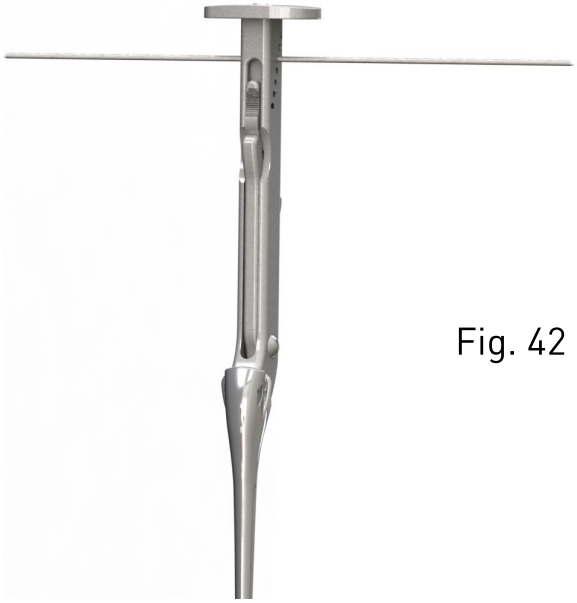


Fig. 42

In case of cementing stem, rinse thoroughly the humeral canal and dry it. Use a cement plug. Put the cement in the canal taking in consideration the classical cementing protocol. Set the definitive implant up and take it down to the cut mark.
Wait for the cement to set completely

Final implant positioning

- Position the humeral head by reproducing the settings of the trial then impact it.

- Impaction is done with the convex impactor (Fig. 43).

- Reduce and reinsert the subscapularis with a transosseous suture.

Warning : The modular neck must be inserted in a perfectly cleaned and dried place.

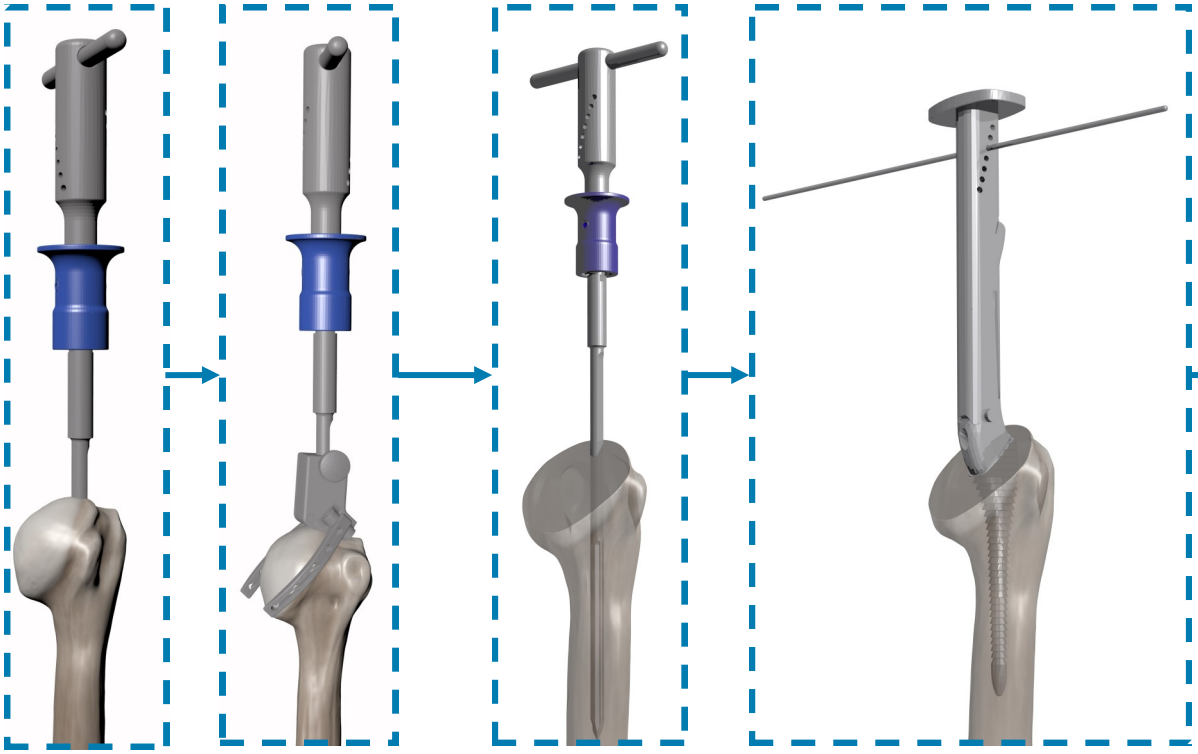
Fig. 43

Notes

Notes

Synopsis: Reverse version

HUMERAL PREPARATION



Drill Ø7

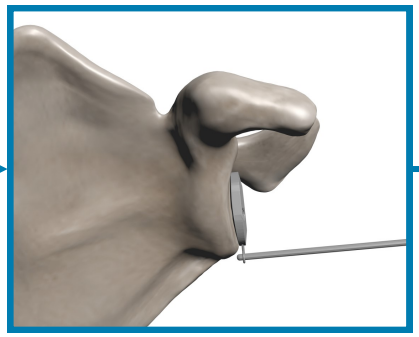
Humeral head resection

Diaphysis calibration

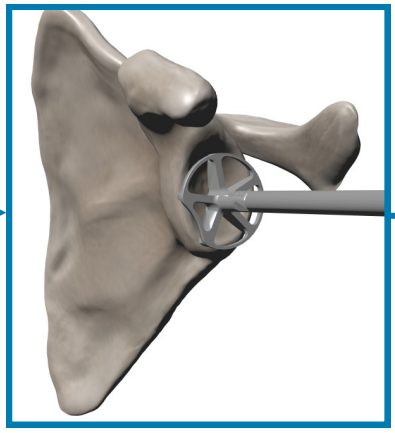
Rasp with retroversion setting

GLENOID PREPARATION

Automatic positioning of the pin
Control of the vertical centering of the glenosphere

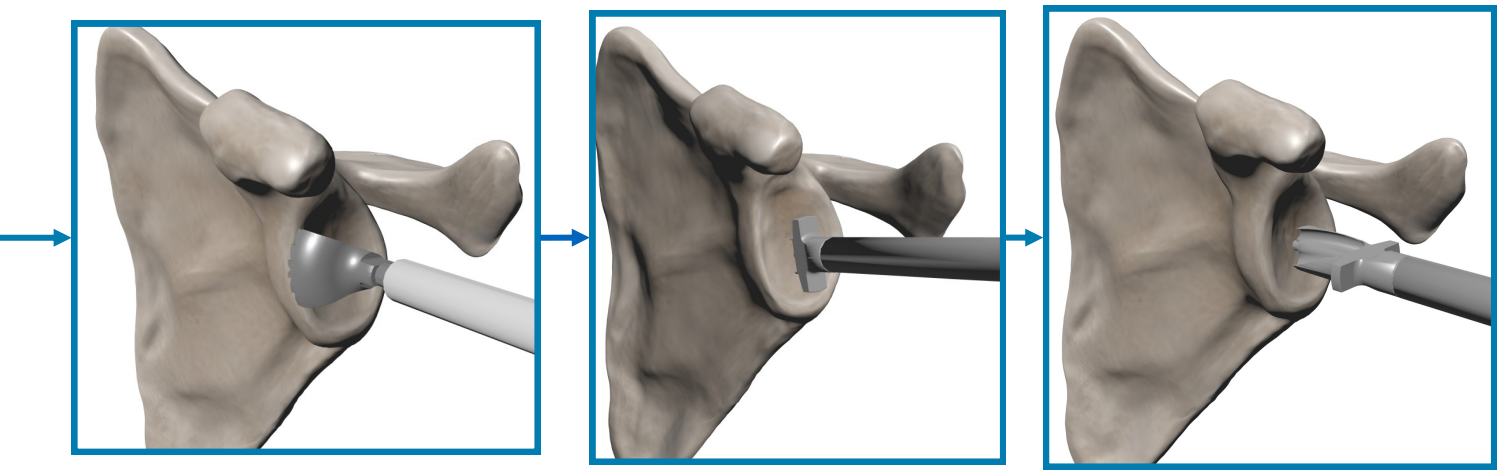


Glenoid reaming



Synopsis: Reverse version

HELICAL GLENOID BASEPLATE

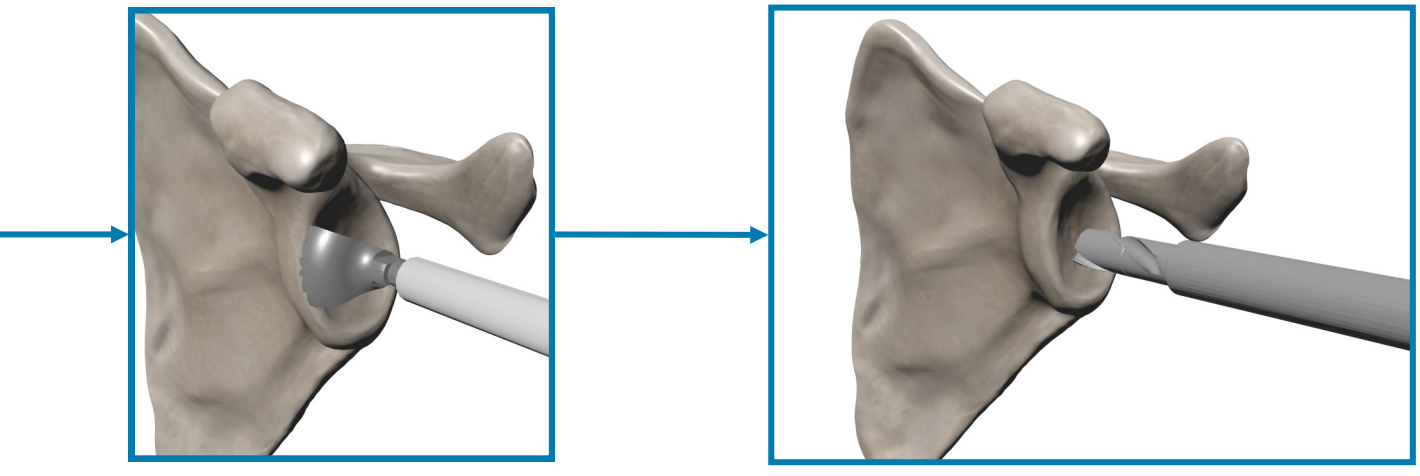


Peripheric glenoid reaming

Preparation of helix entry

Preparation of helical blade

PEGGED GLENOID BASEPLATE



Peripheric glenoid reaming

Peg preparation with drill

Superolateral approach

Incision begins on the clavicle then follows the direction of the anterior border of the acromion and downward 4 to 5 cm.

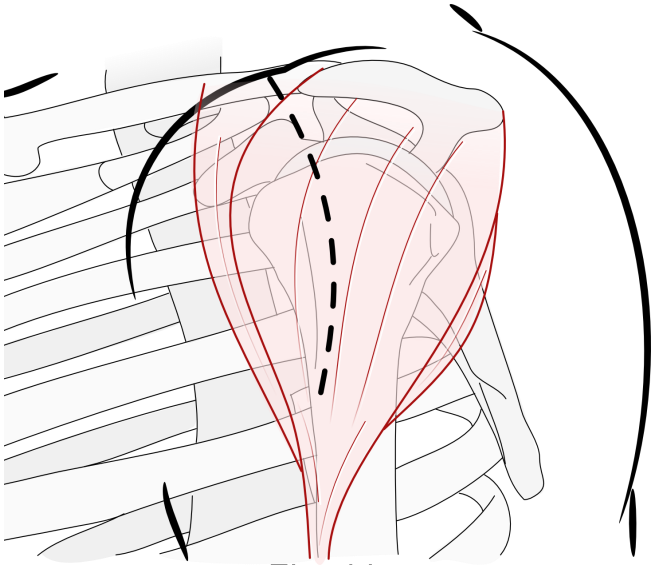


Fig. 44

Release the deltoid at the anterior edge of the acromion.

Extend muscle incision down, following the muscle fibers.

Open the superficial part of the subacromial bursa and if necessary release it entirely.

Retract the deltoid forward with a retractor, placed at the superior corner of the coracoid process.

To improve exposure, the anterior edge of the acromion can be resected

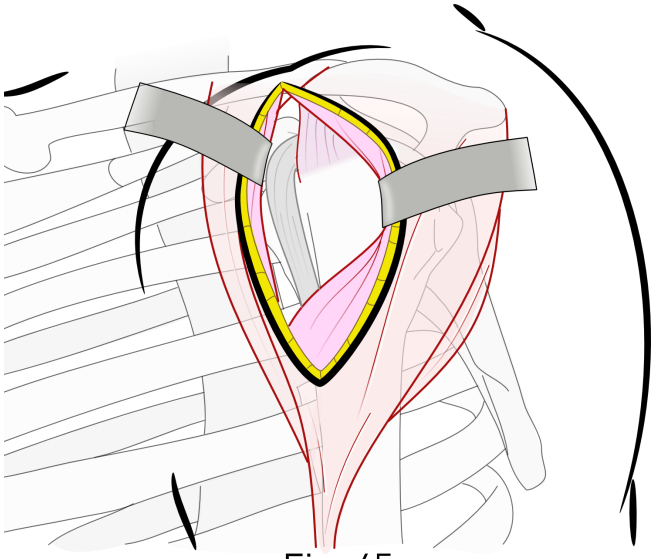


Fig. 45

Superolateral approach

Humeral head exposure.
Place the arm in retropulsion and external rotation then dislocate humeral head.

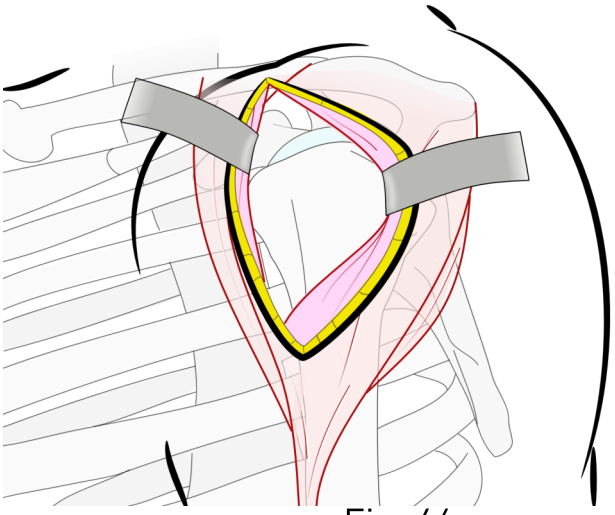


Fig. 46

Deltopectoral approach

See description page 7 (anatomical version)

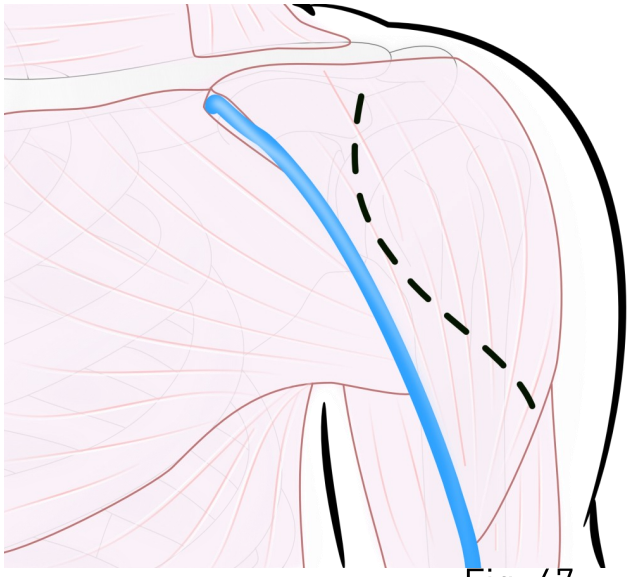


Fig. 47

Humeral resection

- Introduce the first drill Ø7 on the highest point of the head and in contact with the anatomical neck (Fig. 49).

The entry point is located at about 1 cm within and behind the bicipital groove (Fig. 48).

On an developed osteoarthritis with bald head and new acromio-humeral joint (acetabularisation) the entry point will be placed preferentially at the humeral head peak.

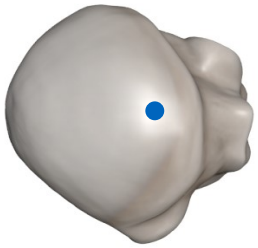


Fig. 48

Fig. 49

- Fix the cutting guide on 140° (Fig.50)

The cutting guide can be set at 132° or 140°.
For a reversed prosthesis of first intention : choose inclination at 140°.

Fig. 50

- Insert the cutting guide in the starter drill Ø7 (Fig. 51).

- Place the cutting guide and the drill in the medullary canal until bone contact.

- Fix the height of the cutting guide with the screw. The optimal cutting level corresponds to the anatomical neck line .

Fig. 51

Humeral resection

- Set the desired retroversion in the handle with the orientation stem. It is aligned with the patient's forearm (Fig. 52).

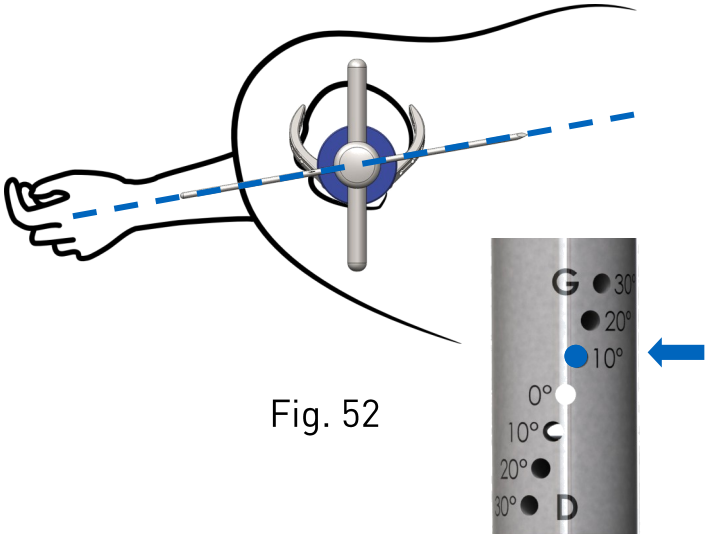


Fig. 52

Indications concerning height : the reference is the anatomical neck line. The resection may be done above (+2.5mm), below (-2.5mm) or in the cutting guide notch (Fig.53). The resection has to be "economic". An excess in resection induces a risk of instability.

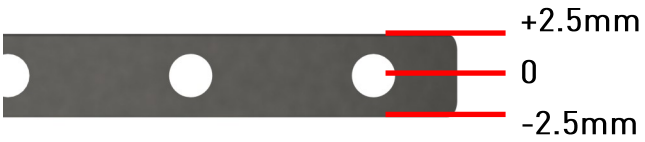


Fig. 53

<u>In a deltopectoral approach :</u>

- The oscillating saw could be fixed by two pins (BNS-025T-100) in order to stabilize the guide. These pins are inserted according to the hole's orientation of the cutting guide. Start the resection in the cutting guide notch or on pins with an oscillating saw (Fig. 54 and 55). Then remove the cutting guide and complete the resection.

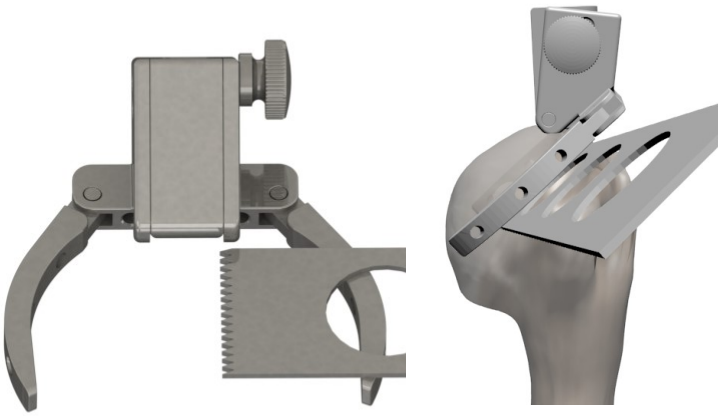


Fig. 54

Restore a natural retroversion. Excessive retroversion may affect stability. An usual retroversion is about 20°.

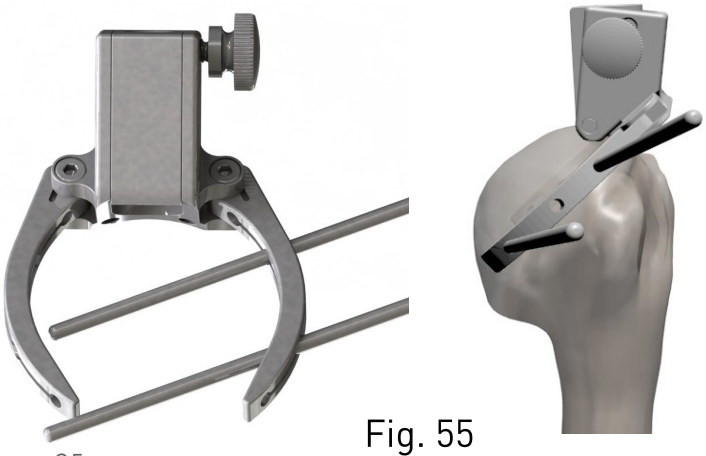


Fig. 55

Humeral resection

Superolateral approach :

- Fix the pins in the 2 holes behind the cutting guide. The pins are divergent.
- Start the cut on the flat part below the pins (Fig. 56).

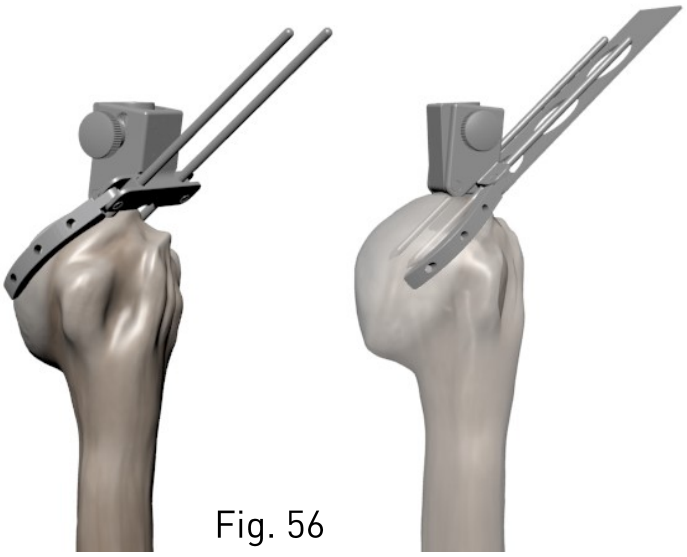


Fig. 56

Retroversion marker (option)

- Identify the retroversion of the cut with the retroversion plate (EAAPRV0) and a Lambotte blade (Fig.57).
- Reproduce the retroversion by aligning the rasp holder (Fig.58).

In the case the humeral bone is very compact, make a bone cylinder equivalent to superior volume of the Ø7mm rasp with the retroversion plate.

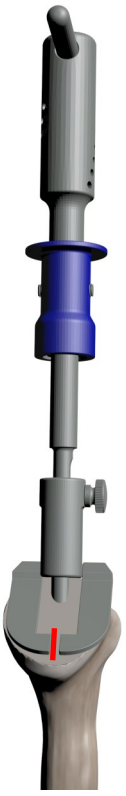


Fig. 57

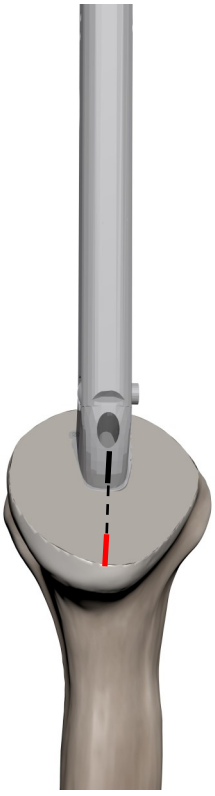


Fig. 58

Humeral preparation

- Calibration by increasing diameter of the drill until the optimal filling of the medullary canal (Fig. 59).

- The size of the last drill defines the maximal size of humeral stem. Use the most filling size is not required. Choose the size related to the first stable rasp

- Push the spring in order to fix the rasp on the rasp holder (Fig. 60).

- Lock the rasp with the trigger (Fig. 60).

- Reproduce retroversion with the orientation stem on the handle (Fig. 62) (stem aligned on patient's forearm).

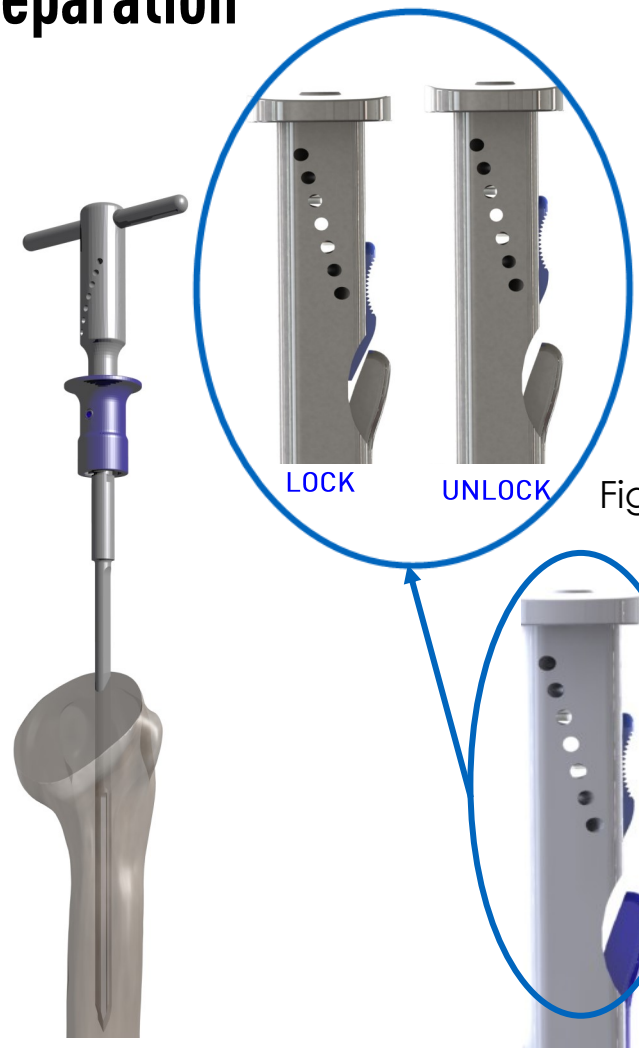
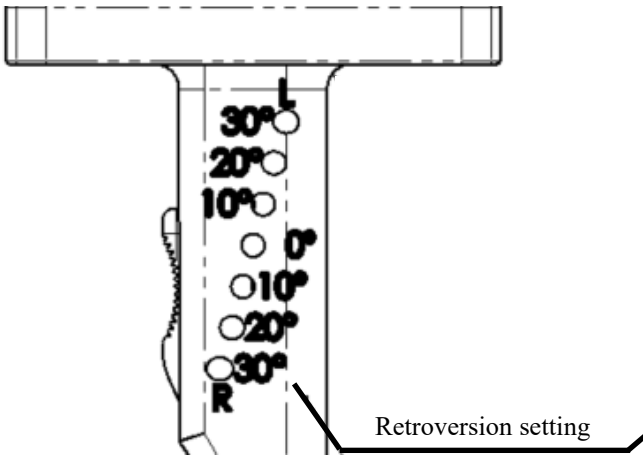


Fig. 61

Fig. 59



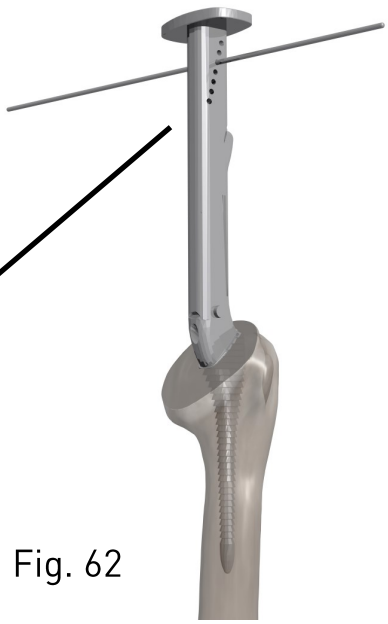


Fig. 62

Fig. 60

- Begin with the smallest rasp (Ø 7) then increase from size until obtain good primary stability.
Press the rasp until the 140° indicator (Fig. 61).

Humeral resection adjustment

To oscillating saw

- Leave the last rasp in place and remove the rasp holder by pushing the spring.
- Place the 140° angle corrector and adjust the cut freehand by guiding the saw blade in contact with the superior face of the 140° ange corrector (Fig. 63).

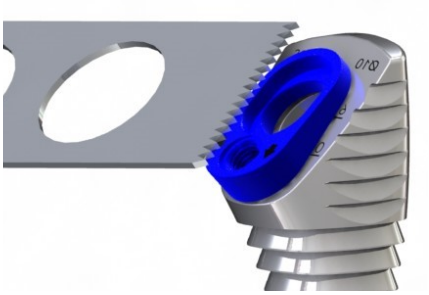
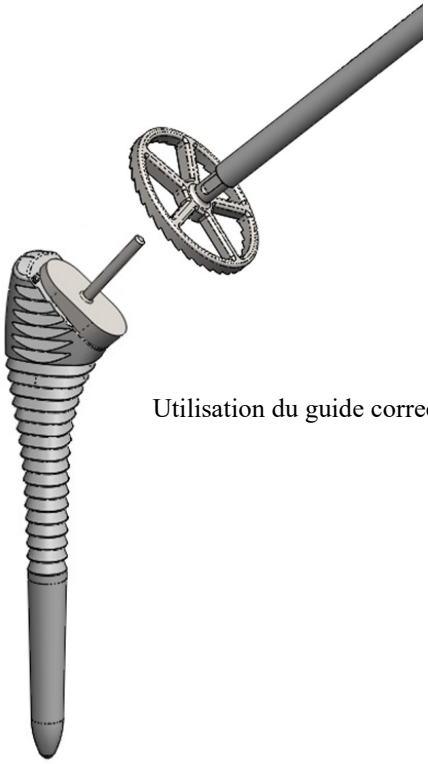


Fig. 63

Surface planer use

Montage de la fraise à resurfacer

- In order to refine the resection, use the surface planer. This humeral resection adjustment could be made either on the humeral rasp of the definitive humeral stem
- To this end, carry out the adapted guide
- On the rasp, use the adapter 8° for surface planer to achieve the levelling taking in consideration the 140° CCD angle



Utilisation du guide correcteur 8°

Humeral resection adjustment

- On the 140° definitive stem, use the adapter 0° for surface planer.

- Activate the motor before entering in bone contact. Advance the cutter slowly until it stops.

This step may be made before or after the glenoid preparation and must be made before trials.

- Place the humeral proctector (Fig. 64).

Fig. 64

Glenoid exposure

Deltopectoral approach :

Place 3 retractors (Fig. 65):

- One behind the posterior neck of the glenoid in order to push the humerus back
- One at the bottom of the glenoid pillar
- One in front of the subscapular groove.

Be sure to have a good release of the inferior part of the glenoid.

- Perform a capsulotomy with circumferiential labrum resection, and remove capsular and synovial excess.

The inferior capsulotomy allows to push humerus back, for easier glenoid exposure.

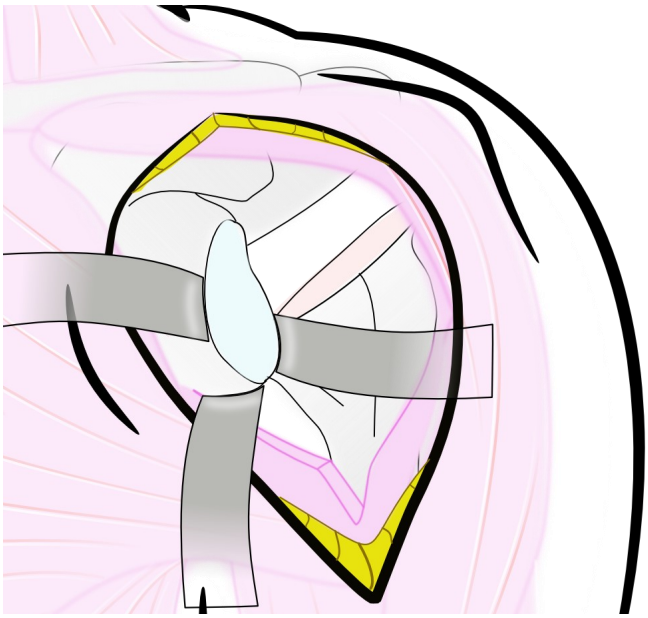


Fig. 65

Superolateral approach :

- Labrum removal and particularly inferior capsulotomy allow good glenoid exposure.

- Remove eventual osteophytes in order to correctly identity glenoid borders.

- Lower humerus with the humeral retractor by leaning against the inferior glenoid part (Fig. 66 et Fig. 67).

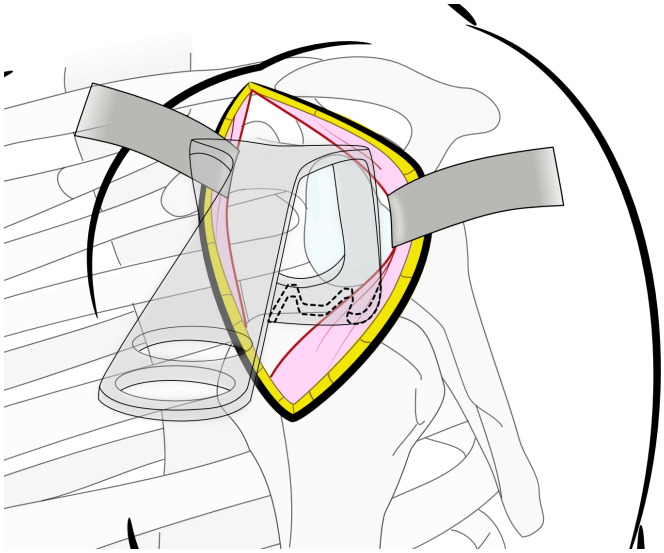


Fig. 66

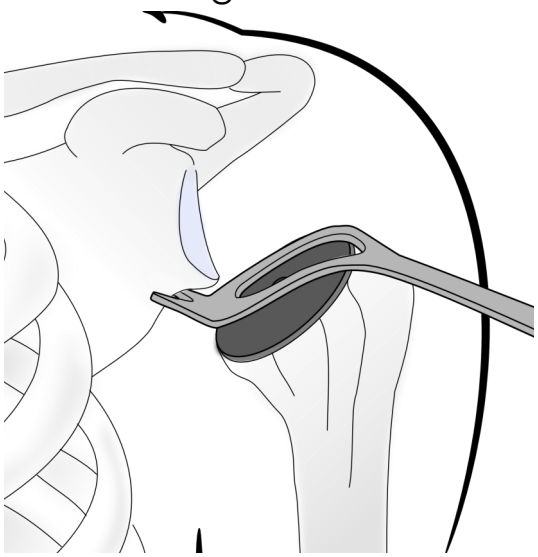


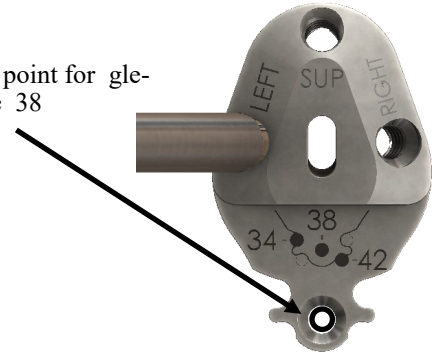
Fig. 67

Glenoid preparation

The use of the glenoid centralizer optimizes the glenoid preparation by guiding the guide pin positioning. The pin position determines the glenosphere final position. The glenoid must be covered as well as possible and the glenosphere must be placed a bit below its lower edge.

- Glenoid centralizer set up

Palpation point for glenosphere 42



Palpation point for glenossphère 38

Fig. 68

Fig. 69

By superolateral approach :

By deltopectoral approach :

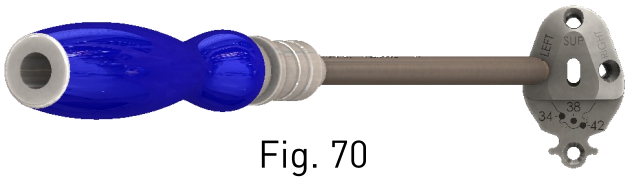


Fig. 70

- Inferior holes allow to palp the inferior glenoid part (Fig. 70). The distance between the central hole and the inferior holes is exactly the radius of the glenosphere.

The centering can also be realized freehand by positioning the drill few millimeters below the glenoid center.

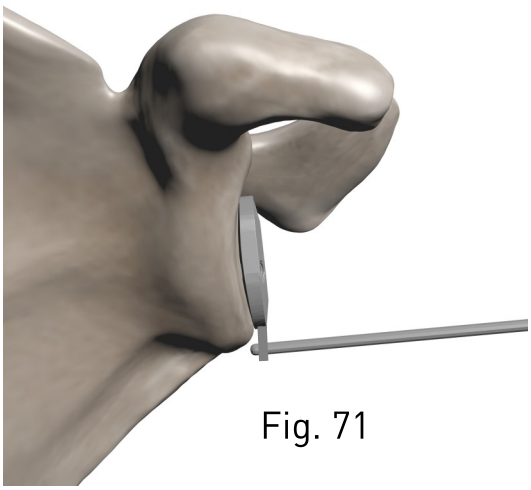


Fig. 71

Glenoid preparation

The instrument gives an option to lower the center of 2.5mm (Fig. 72).
The central hole allows an orientation of the pin with an inferior tilt of 10° (Fig. 72).
The tilt of 10° and the lowering of 2.5mm avoid inferior conflict, inducing notch (Fig. 73).

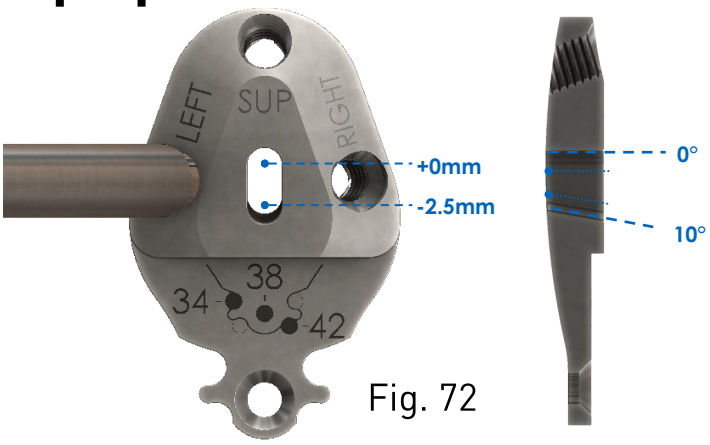


Fig. 72

- Set up a threaded pin diameter 2.5 (BS-025F-200) and leave it in situ

Screw the ream on its handle and tighten with a flat key (Fig. 74). The hudson junction enables to fix the ream on a motor using the « REAM » function. It has to be fixed on the T-handle to ream manually.

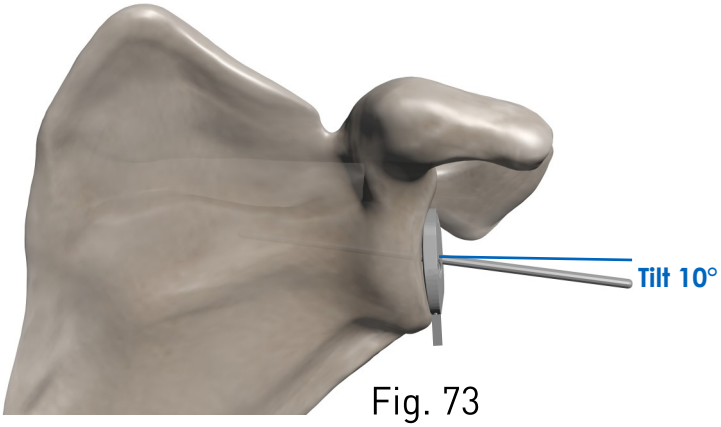


Fig. 73

After setting up the threaded pin in glenoid, introduce for the glenoid bottom resurfacing:

1. The ream :
   - Ø25mm for the reducted baseplate
   - Ø30mm (Fig. 75) in other cases

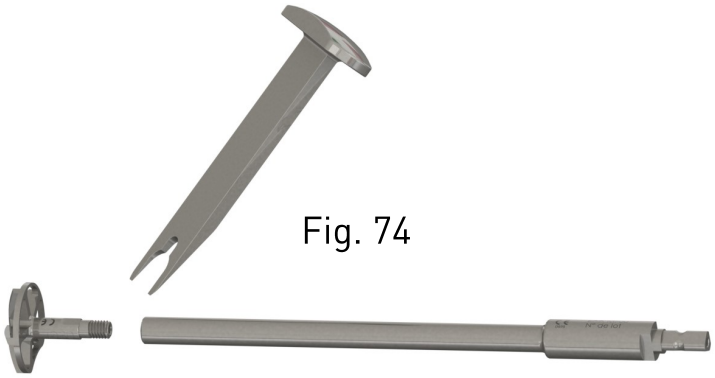


Fig. 74

As a precaution, the manual reaming is preferable. If reaminf : start the motor at few millimeters of the glenoid surface and apply the ream in movement, to avoid that the cutting edges of the ream engage too brutally.

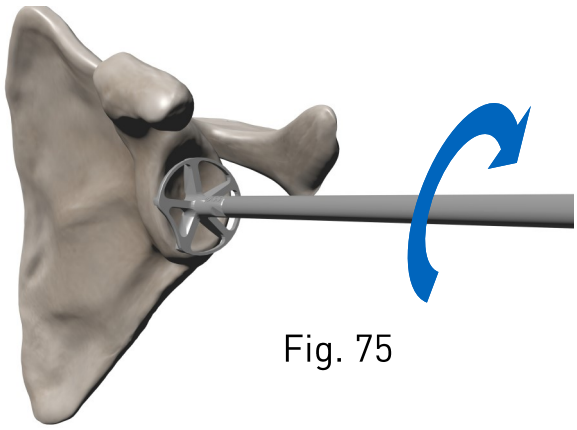


Fig. 75

Resurfacing doesn't have to be excessive. It has to be subchondral and has to avoid cancellous bone.

Glenoid preparation

Two diameters of glenosphere exist : 38 and 42. Peripheric reaming is then adapted to the glenosphere size desired. Use the peripheric ream Ø39mm (EAA FG39) for the glenosphere 38 and the peripheric ream Ø43mm (EAA FG43) for the glenosphere 42.

2. The use of peripheric reams (Fig. 76) clears the peripheric glenoid up to prepare glenosphere impaction.

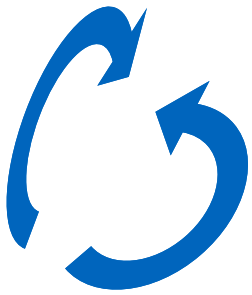


Fig. 76

It can be used in the 2 rotation directions. It has to be used manually with the T-handle.

Pour la glène à plot cf page 34

Base glène à lame hélicoïdale

3. The marker is introduced on the pin and is used to mark the helical blade entry (Fig. 77). Place the handle at 1 o'clock referring to the glenoid long axis.

In some cases when bone is sclerous with enameled aspect, the preparation for the helix must be done carefully: Lambotte blade, micro-perforations...

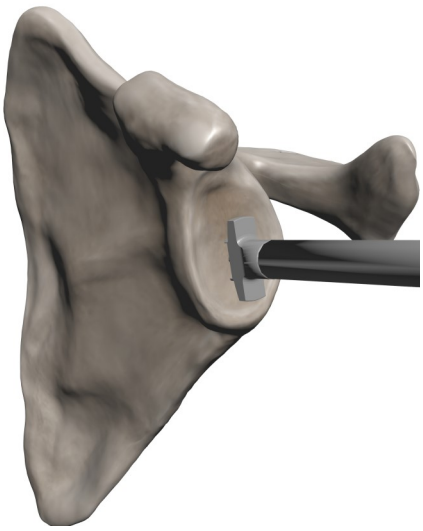
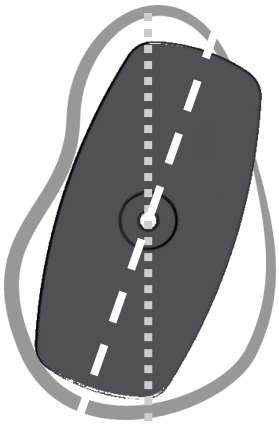


Fig. 77

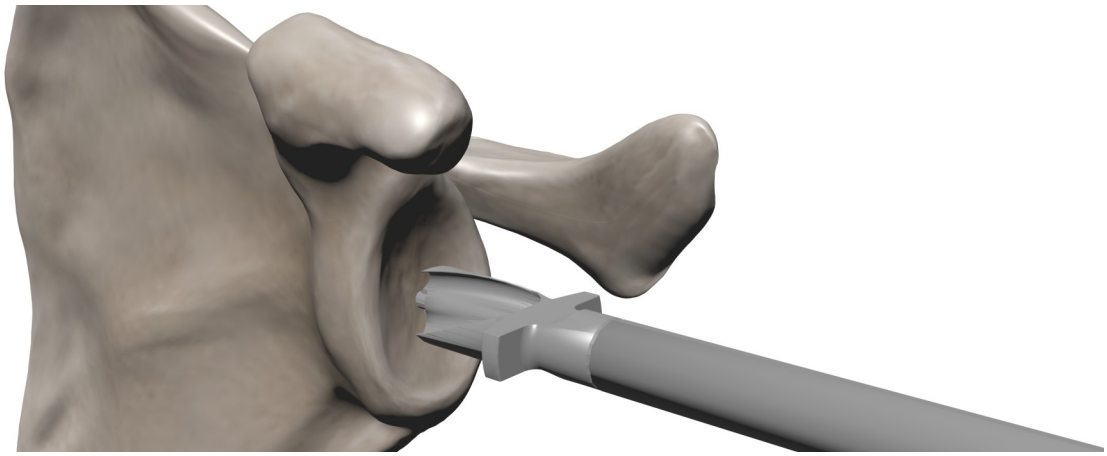
Rotation 70°/80°



1 o' clock compared to glenoid long axis

Glenoid steps

Glenoid helical baseplate



4. Helical chisel (Fig. 78).

The instrument handle is still inserted oriented the same way as the previous one (helical chisel oriented at 1 o'clock referring to the glenoid long axis) (Fig. 79).

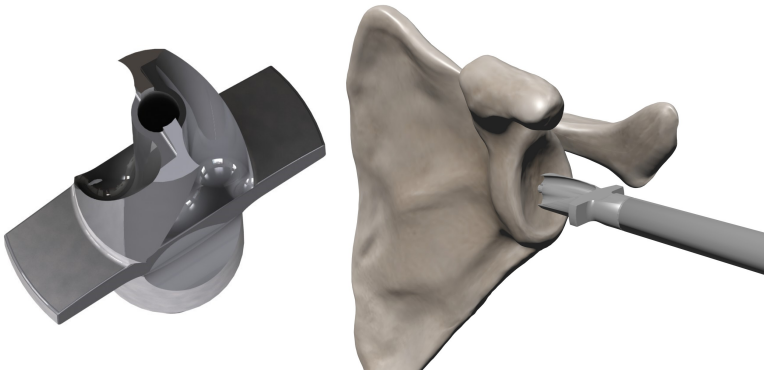


Fig. 78

Hit with a hammer for the helix to progress in the glenoid with a 70°/80° rotation.
At the end of impaction, the instrument bit must reach the glenoid bone.

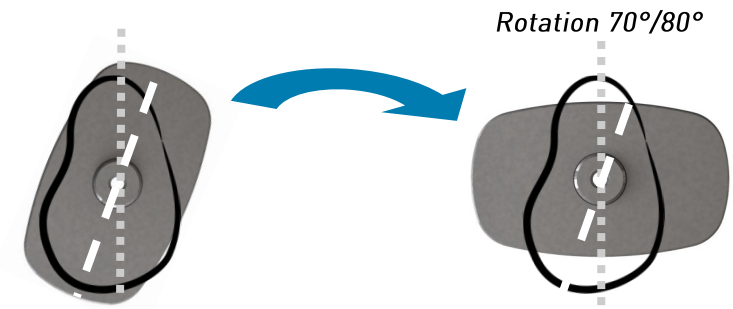


Fig. 79

In some cases where bone is compact, it can be advised to remove the chisel and start again to push the chisel until bone contact.

Glenoid steps

Adapt the final baseplate on the impactor (Fig. 80).

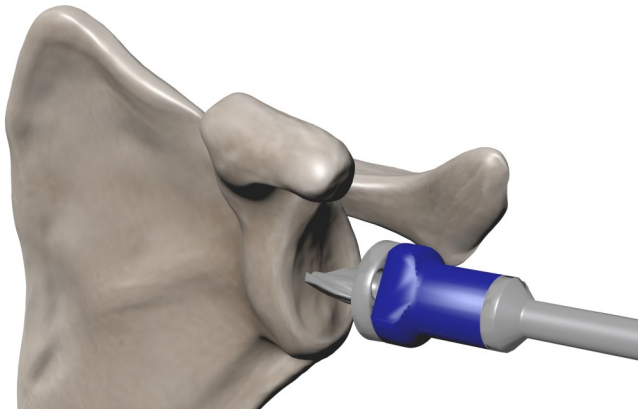
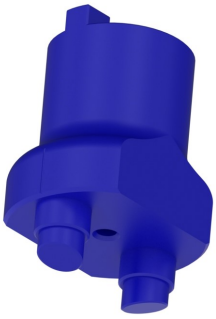


Fig. 80

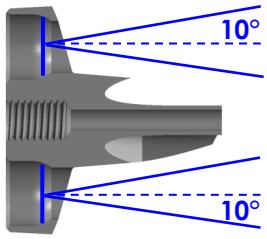
The two pegs of the impactor are inserted in the two screw holes B and D (anterior and posterior) (Fig. 81).

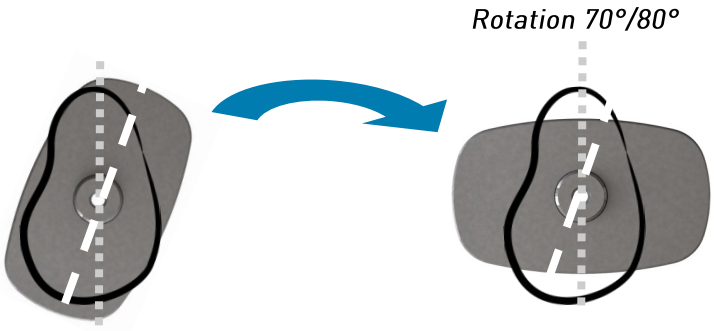
Introduce the assembly on the pin and impact the baseplate in the glenoid. Be careful to orient the handle in the same axis that during preparation (1 o'clock referring to the glenoid long axis).

Guided by the helix, the baseplate rotates clockwise during its progression (about 70°/80°).



This instrument does not enable a stable base





All the screw holes allow a 10° orientation on either side. The baseplate can be impacted with the threaded handle but without pin.

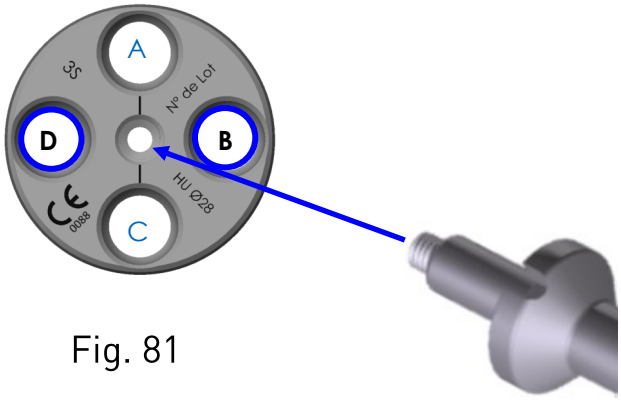


Fig. 81

Glenoid steps

Pegged glenoid baseplate

- Two baseplates sizes are available: Ø25 and Ø28. Each one has one standard peg (15mm) or a long peg (27mm) (Fig.82)

Fig. 82

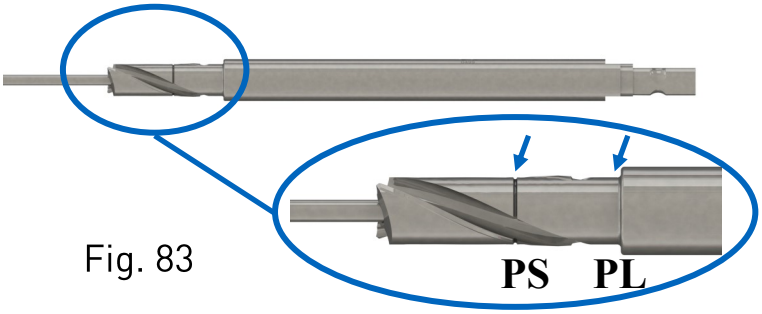
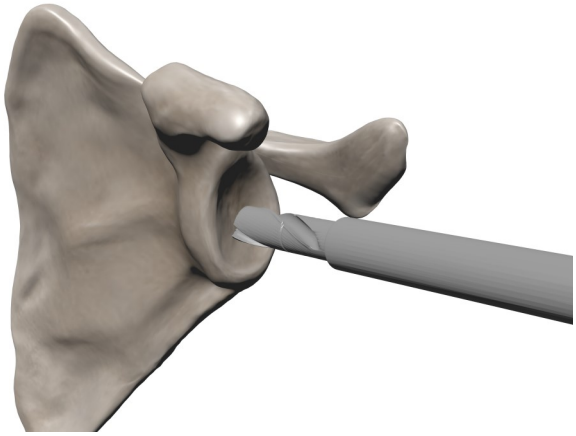


Fig. 83

Pegged glenoid beseplate implantation : (start after page 31) :

- Drill glenoid until the marker and abutment visible on the cannulated drill (EAA MP80) (Fig. 83).



- Impact the baseplate in the same way used by the helical blade (Fig. 84).

Be careful with the base orientation when impacting. The « UP » must be on the superior part of the glenoid. The screws holes pre-oriented will be positionned superiorly and inferiorly. (Fig. 84).

Note that the screw holes in the Ø25 base are symmetrical

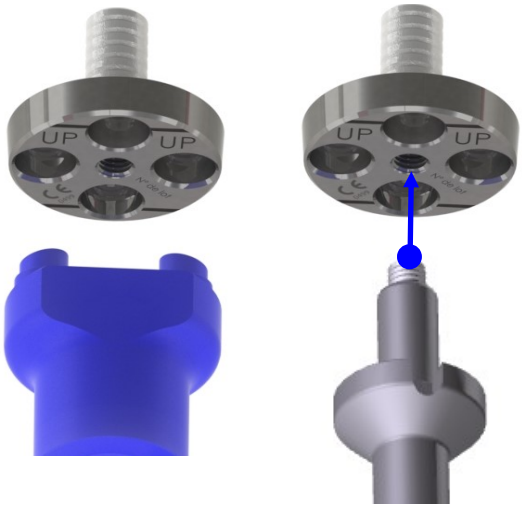


Fig. 84

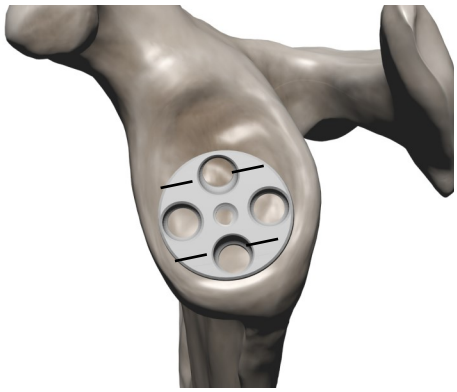
Glenoid steps

Pegged or helical glenoid baseplate:

To place the glenoid base, it is also possible to use the impactor/extractor with threaded end (non-perforated Ref EAA MF05 or EAA MIU0 depending on versions).

Fig. 85

Check the good base application by the screws holes.



- The plate fixation is completed by 2 to 4 cancellous thread screws of Ø5mm.

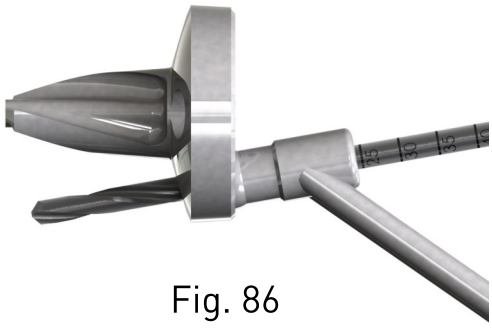


Fig. 86

- Use the Ø3.2mm drill and the drill guide (Fig. 86). The drill is graduated to enable a direct reading of the screw length (Fig. 86).
- If necessary, check with the measurer.
- Place the screws by tightening them alternatively to insure a progressive compression.

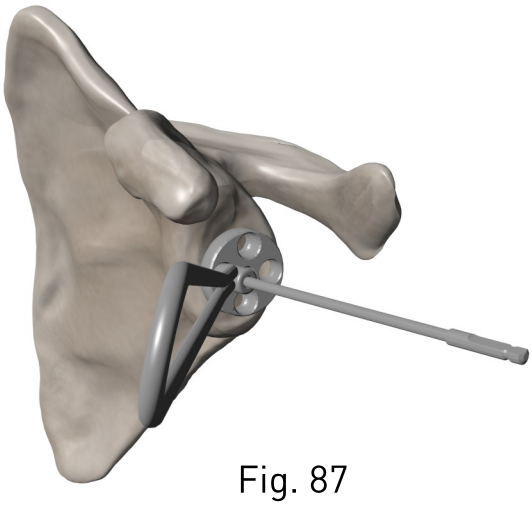


Fig. 87

Final glenosphere

Glenosphere positioning (Ø38 or Ø42)

Once the baseplate correctly exposed with adequate retractors, insert glenosphere Ø38mm in the baseplate.

- Use 3.5mm screwdriver to hold it (Fig. 102)

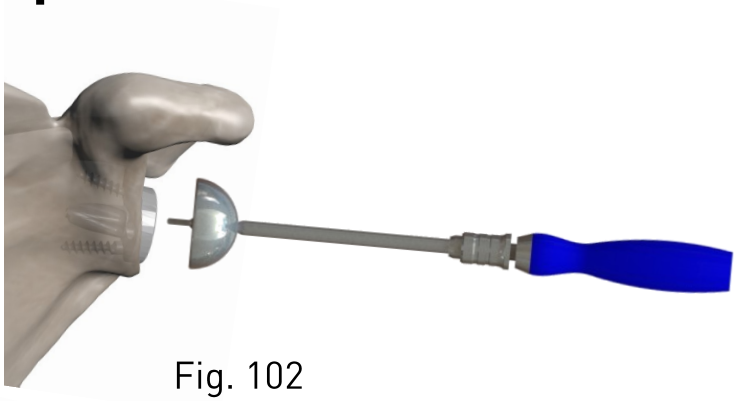


Fig. 102

- The distal part of the screw is introduced in the central hole of the helix (Fig. 103)

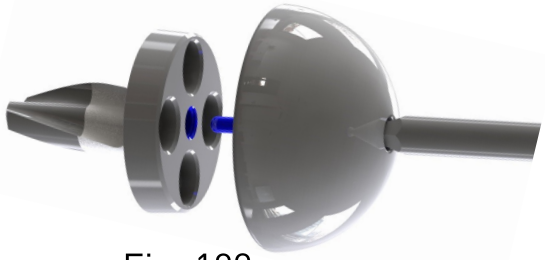


Fig. 103

- The glenosphere is screwed without forcing.

Caution :
DO NOT IMPACT THE GLENOID SPHERE WITH A HAMMER

Cannulated glenosphere

Cannulated glenosphere positioning (Ø38 or Ø42)

Once the baseplate correctly exposed with adequate retractors, place the guide pin diameter 2 without fixing it to the bone in order to remove it easily

With the cannulated screwdriver, insert the glenosphere (Ø38 or Ø42) on the pin to guide the whole to the baseplate. Start the glenosphere screwing and turn until the glenosphere and the baseplate are united.

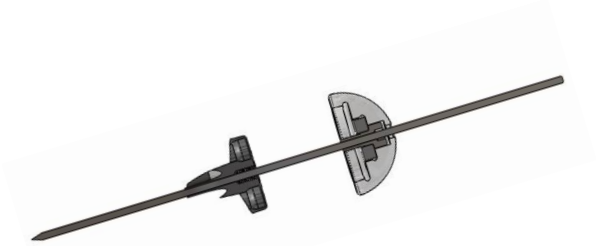


Fig. 104

Caution :
VERIFY THE DIAMETER OF THE BASEPLATE AND GLENOSPHERE BEFORE IMPLANTATION

	Glenosphere EAI Sx35	Glenphere EAI Sx38	Glenphere EAI Sx42
EAI 0BPS	✗	✓	✓
EAI 0BPL	✗	✓	✓
EAI 0BHU	✗	✓	✓
EAI 0BRS	✓	✗	✗
EAI 0BRL	✓	✗	✗

Trials

Two cups are used for 140° stem :

- A centered cup 0° (Fig. 88)
- An off-centered cup 0°(Fig. 89)

The cone off-centered is 4.5mm

Fig. 88

Fig. 89

For 132° stem, only one cup has to be used : the centered cup 8° (there is no off-centered cup).

Fig. 90

	Tige 132°	Tige 140°
Cupule centrée 8°	✓	✗
Cupule centrée 0°	✗	✓
Cupule décentrée 0°	✗	✓

Trials

3 insert thicknesses (Fig. 91) for glenosphere 38 :

- +6mm—STANDARD
- +9mm—LONG
- +12mm—EXTRA-LONG

3 insert thicknesses (Fig. 91) for glenosphere 42 :

- +6mm—STANDARD
- +9mm—LONG
- +12mm—EXTRA-LONG

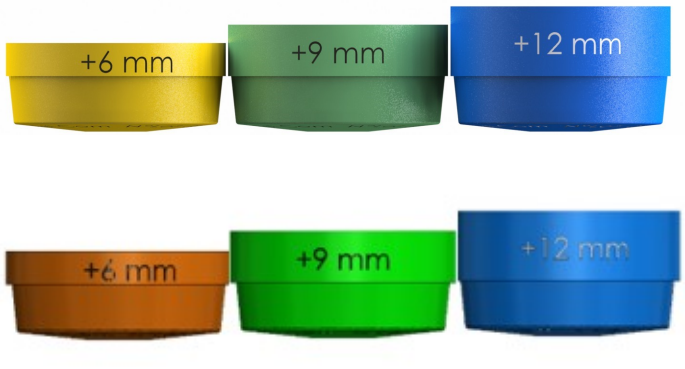


Fig. 91

It should be noted that it exists a retentive insert +9mm for glenosphere 38 and glenosphere 42

Trials on rasps

Warning : always use the 140° angle corrector to do trials with D0° and C0° cups

Rasp are at 132°. In order to adjust the 140°, use angle corrector, or the humeral cup with integrated angle

According to anatomy :
Use the angle corrector by leaving the high

Fig. 92

According to anatomy : use the angle corrector by leaving the low position free to lateralize the humerus

Fig. 93

Be careful always orient the arrows down

N.B.: Warning: *Clean superior extremity of the rasp to correctly place the angle corrector. It can be placed and removed with the threaded handle (EAA MIU0).*

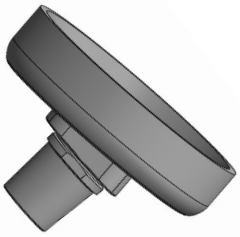
Trials

1 - Centered cup 0° - 140° stem

With ANGLE CORRECTOR or CUP WITH ANGLE CORRECTOR

Angle corrector + cup

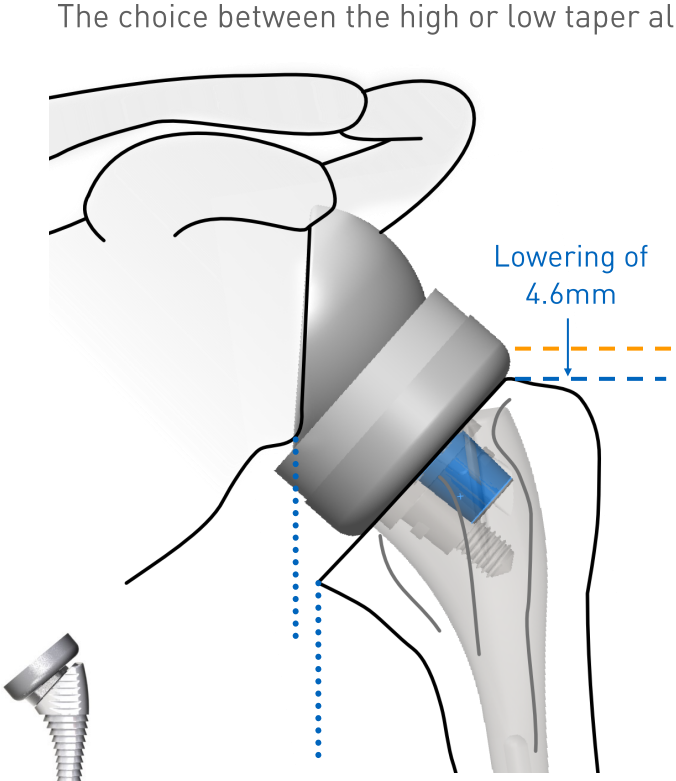
Fig. 94



Cup with integrated angle corrector

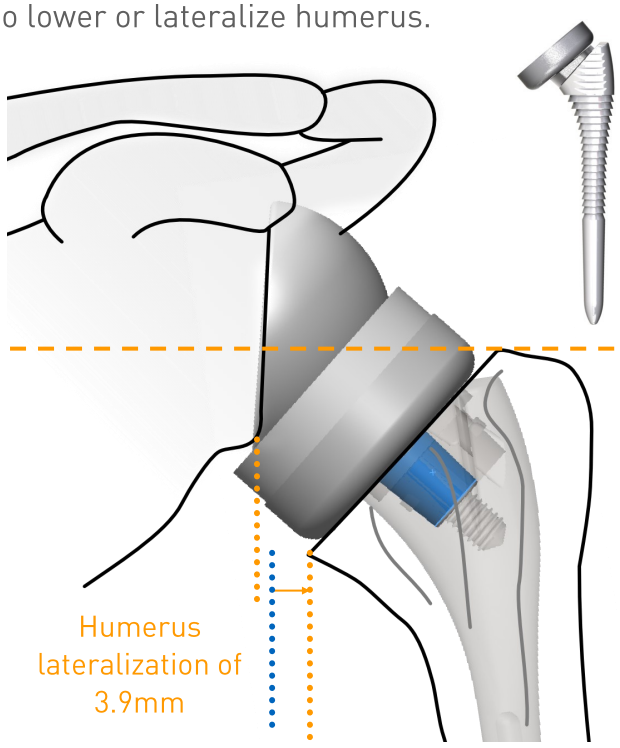
Fig. 95

The choice between the high or low taper allows to lower or lateralize humerus.



Lowering of 4.6mm referring to low position.

Fig. 96



Humerus lateralization of 3.9mm referring to high position.

Fig. 97

Trials

2 - Off-centered cup 0° - 140° stem

With angle corrector

It allows the choice between 8 positions to cover humeral resection if it is off-centered.

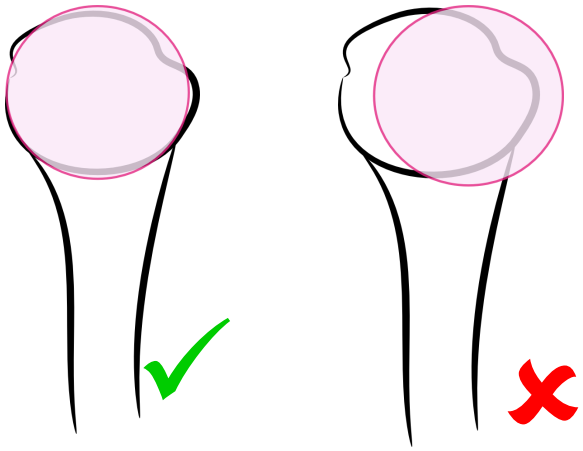


Fig. 98

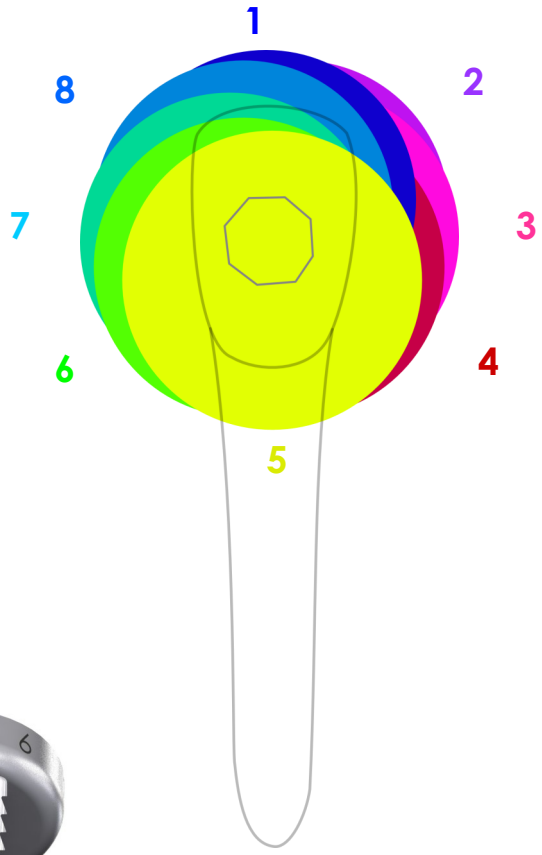


Fig. 99

Position is read at the back of the rasp (Fig. 100).

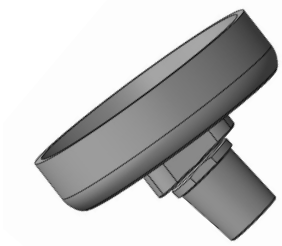
Fig. 100

3 - Centered cup 8° - 132° stem

Without angle corrector

The centered cup 8° can be placed in the high or low taper (Fig. 101) to lower or lateralize humerus.

Once, trial implants in place, test the prosthesis stability in every mobility sector.



Cup with integrated angle

Fig. 101

Final implants

- Choose the type of stem adapted : EVO, standard cementless or standard cemented.

With cementless implant, impaction doesn't have to be complete in order to facilitate the positioning and the impaction of the cup and the insert.

For a deltopectoral approach : Before impacting the stem, place transosseous wires in the lesser tuberosity to fix the subscapularis.

Fig. 102

- Fix the final stem of the selected model to the rasp holder and impact by respecting the defiinitive retroversion (Fig. 103).

In case of cementing stem, rinse thoroughly the humeral canal and dry it. Use a cement plug. Put the cement in the canal taking in consideration the classical cementing protocol. Set the definitive implant up and take it down to the cut mark.
Wait for the cement to set completely

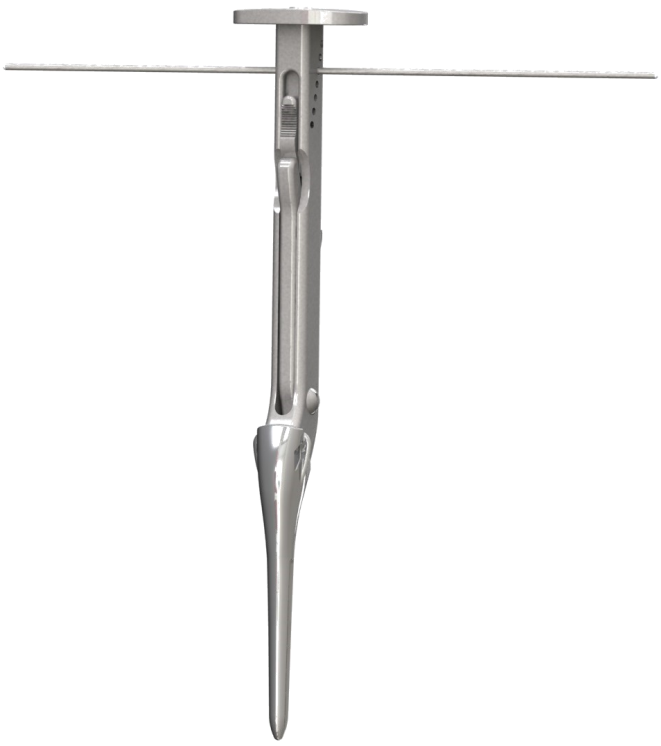


Fig. 103

Final implants

- Polyethylene insert impaction in the final cup is carried out on the table with the anvil and the impactor. (Fig.104)

Check that humeral resection surface is flat and perfectly cleaned. If needed, refer to "humeral resection adjustment" p.28.

- Impact the insert and the cup by respecting the position that has been defined during trials. This impaction also ensures also final humeral stem impaction.

- Reduce the prosthesis.

Test shoulder mobility by being sure that there is no piston or cam effect (interest of off-centered cup) then close the wound.

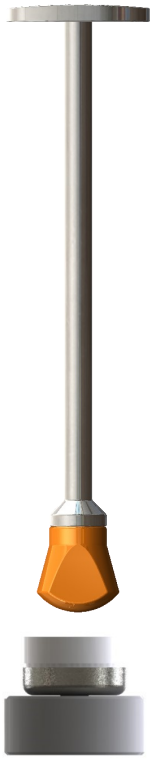


Fig. 104

Warning : The cone of the humeral cup must be inserted in a place perfectly cleaned and dried

Deltopectoral approach:

Fix completely or partially the subscapularis with 3 transosseous points.
At best, fix the lower subscapularis part, often present. Interest on prosthesis stability and rotations.

Superolateral approach:

Fix the deltoid to the acromion with a transosseous suture.

Close on different planes and put an aspirative drain.

Operative suite: Superior limb immobilized. Early passive and slow

Notes

Cup with high-offset

A cup with high-offset (Fig. 105) can be used to compensate an offset of height.

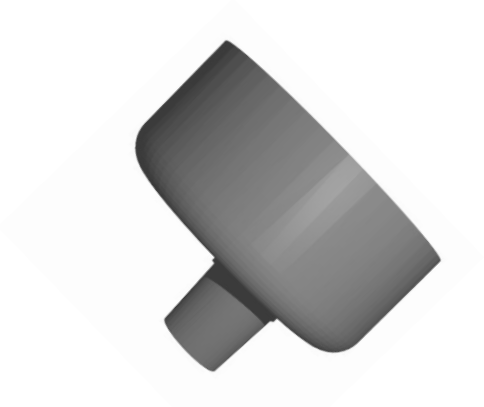
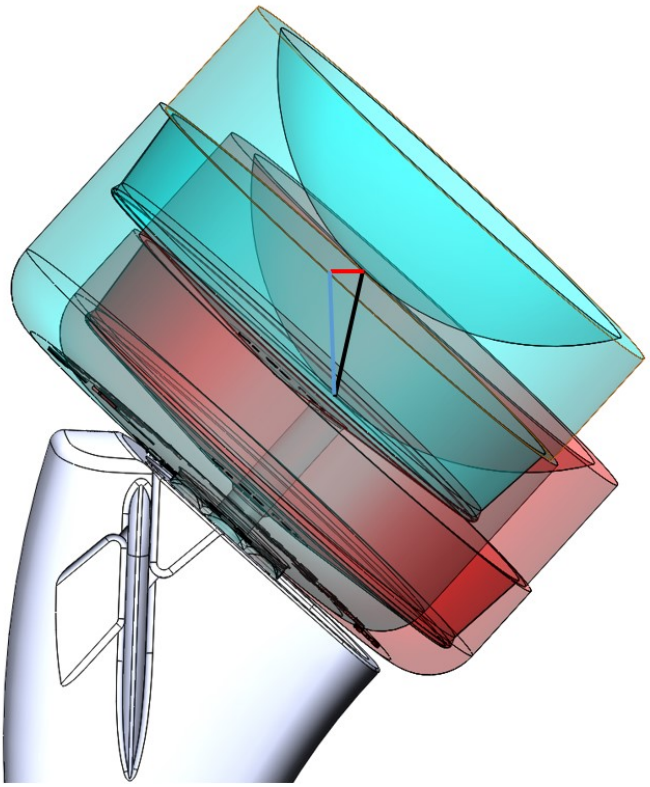


Fig. 105

The use of the high-offset cup will lower the humerus by 9 mm and lateralize it by 1.5 mm.

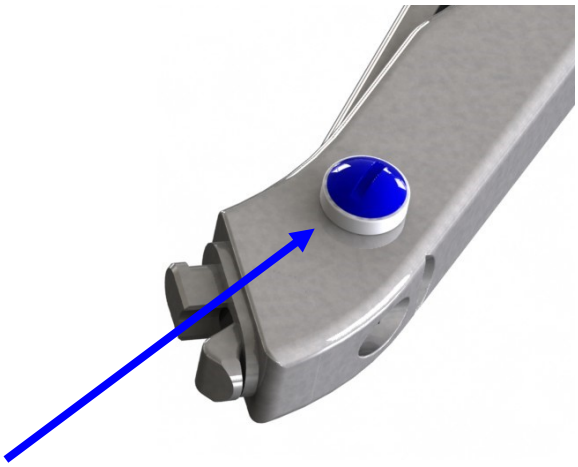


Reminder : the use of the low position of the junction raises the humerus by 4.6 mm and and lateralize it by 3.9 mm compared to the high position.

Rasp or stem extraction

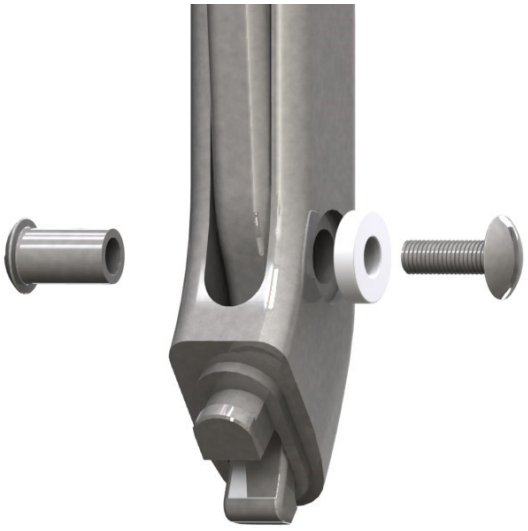
- To remove an ARAMIS stem or rasp firmly fixed :

<u>Disassembly of rasp holder :</u>



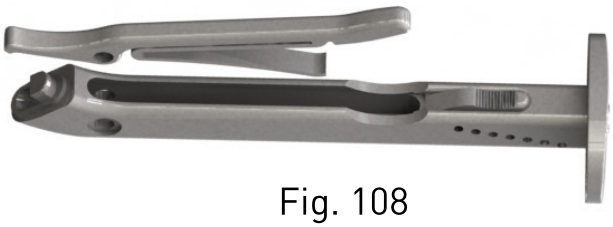
1) Unscrew the rasp holder screw (Fig. 106)

Fig. 106



2) Remove the washer and the hollow screw (Fig. 107)

Fig. 107



3) Remove the spring from the rasp holder (Fig. 108)

Fig. 108

Rasp or stem extraction

4) Put the rasp screw in the rasp holder (Fig. 109)

Fig. 109

5) Fix the assembly on the rasp or the stem (Fig. 110) with the 3.5mm screwdriver (EAA TT35) and screw.

Fig. 110

Sphere and glenoid base extraction

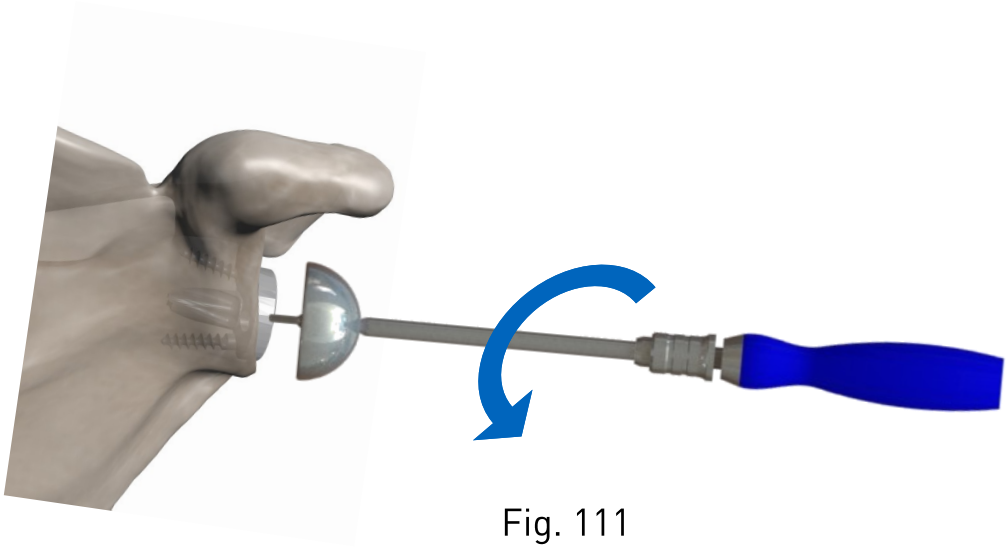
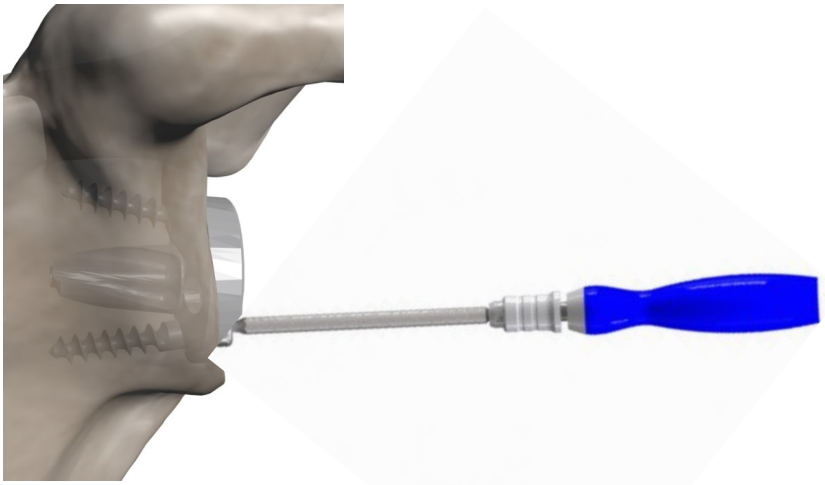


Fig. 111

- To remove an ARAMIS glenosphere, use the 3.5mm screwdriver and unscrew the sphere to disassemble it from the glenoid baseplate.



- Remove the fixation screws.

Fig. 112

- Assemble the holder with threaded end (EAA MF05 or EAA MIU0 different version) on the central thread of the glenoid baseplate. After breaking the bone bridges, on the back of the baseplate with a Lambotte blade, extract the implant.

Fig. 113

Implant references

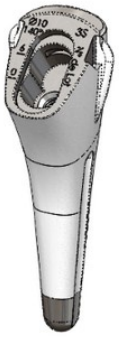
Tige CIMENTEE

EAI 0C07	Cemented stem Ø7mm 132°
EAI 0C08	Cemented stem Ø8.5mm 132°
EAI 0C10	Cemented stem Ø10mm 132°
EAI 0C11	Cemented stem Ø11.5mm 132°
EAI 1C07	Cemented stem Ø7mm 140°
EAI 1C08	Cemented stem Ø8.5mm 140°
EAI 1C10	Cemented stem Ø10mm 140°
EAI 1C11	Cemented stem Ø11.5mm 140°

Tige SANS CIMENT

EAI 0H08	Cementless stem Ø8mm 132°
EAI 0H10	Cementless stem Ø10mm 132°
EAI 0H11	Cementless stem Ø11.5mm 132°
EAI 0H13	Cementless stem Ø13mm 132°
EAI 1H08	Cementless stem Ø8mm 140°
EAI 1H10	Cementless stem Ø10mm 140°
EAI 1H11	Cementless stem Ø11.5mm 140°
EAI 1H13	Cementless stem Ø13mm 140°

EVO Tige Courte SANS CIMENT



EAI 0E07	Cementless humeral short stem Ø 7 mm 132°
EAI 0E08	Cementless humeral short stem Ø8.5 mm 132°
EAI 0E10	Cementless humeral short stem Ø10mm 132°
EAI 0E11	Cementless humeral short stem Ø11.5mm 132°
EAI 0E13	Cementless humeral short stem Ø13mm 132°
EAI 1E07	Cementless humeral short stem Ø 7 mm 140°
EAI 1E08	Cementless humeral short stem Ø8.5 mm 140°
EAI 1E10	Cementless humeral short stem Ø10mm 140°
EAI 1E11	Cementless humeral short stem Ø11.5mm 140°
EAI 1E13	Cementless humeral short stem Ø13mm 140°

Implant references

Cupule humérale

EAI CHC0	Centered 0° humeral cup
EAI CHD0	Off-centered 0° humeral cup
EAI CHC8	Centered 8° humeral cup
EAI CH10	Cup with high-offset +10mm

Insert polyéthylène

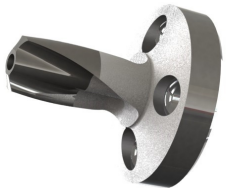
EAI IS06	Standard PE insert Ø 38 /+6mm
EAI IS09	Standard PE insert Ø 38 /+9mm
EAI IS12	Standard PE insert Ø 38 /+12mm
EAI IR09	Retentive PE insert Ø 38 /+9mm
EAI I406	Standard PE insert Ø 42 /+6mm
EAI I409	Standard PE insert Ø 42 /+9mm
EAI I412	Standard PE insert Ø 42 /+12mm
EAI I4R9	Retentive PE insert Ø 42/+9mm

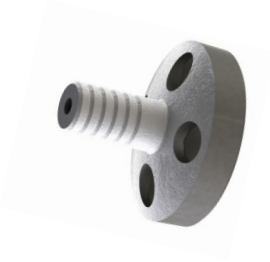
Sphère Glénoïdienne

EAI SG38	Glenosphere Ø38mm
EAI SC38	Cannulated glenosphere Ø38mm
EAI SG42	Glenosphere Ø42mm
EAI SC42	Cannulated GlenosphereØ42mm
EAI SG35	GlenosphereØ38mm for baseplate 25
EAI SC35	Cannulated glenosphereØ38mm for base-plate 25

Base Glénoïdienne

EAI 0B28	Helicoidale baseplate Ø28mm length21
EAI 0BHU	Universal helicoidale baseplate Ø28mm length 18
EAI 0BPS	Baseplate - standard peg Ø28mm
EAI 0BRS	Baseplate reducted - standard peg Ø25mm
EAI 0BPL	Baseplate - long peg Ø28mm
EAI 0BRL	Baseplate reducted - long peg Ø25mm

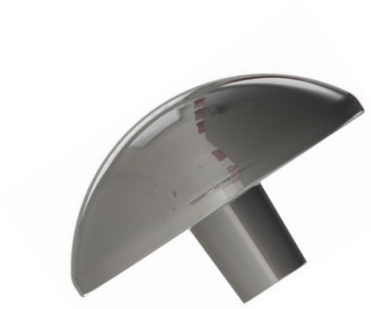




Implant references

Vis

EAI V515	Screw Ø5mm L15mm
EAI V520	Screw Ø5mm L20mm
EAI V525	Screw Ø5mm L25mm
EAI V530	Screw Ø5mm L30mm
EAI V535	Screw Ø5mm L35mm
EAI V540	Screw Ø5mm L40mm
EAI V545	Screw Ø5mm L45mm



Tête humérale

EAI 4013	Humeral head Ø40 H13mm
EAI 4315	Humeral head Ø43 H15mm
EAI 4617	Humeral head Ø46 H17mm
EAI 4918	Humeral head Ø49 H18mm
EAI 4920	Humeral head Ø49 H20mm

Glène polyéthylène

EAI G030	Polyethylene glenoid Ø30mm
EAI G033	Polyethylene glenoid Ø33mm
EAI G036	Polyethylene glenoid Ø36mm
EAI G136	Polyethylene glenoid Ø36mm R34

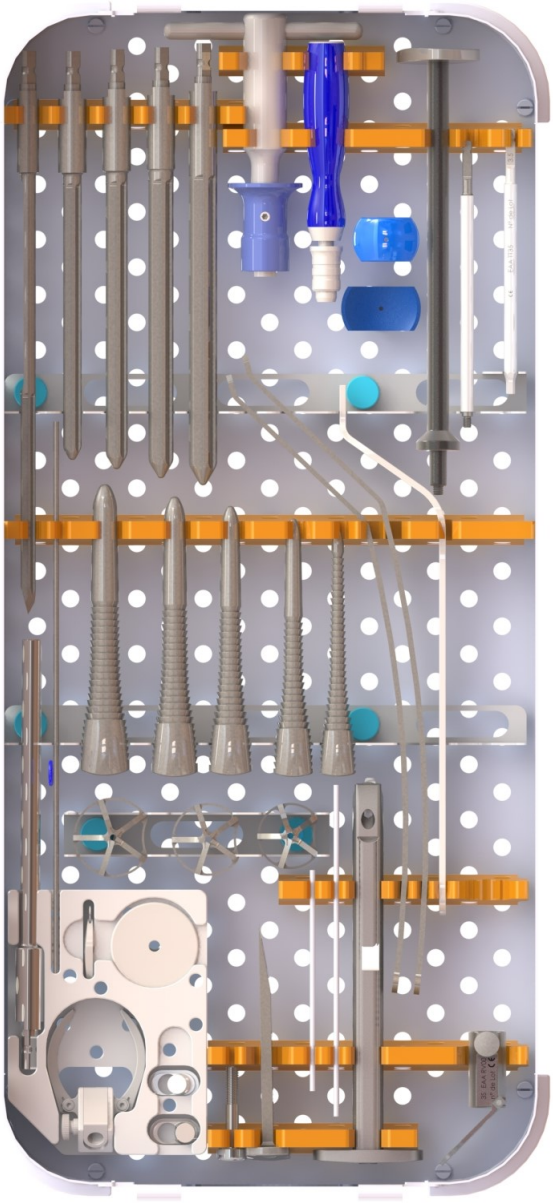
Notes

Notes

Instrument set

EAA A070	Drill Ø7mm
EAA A085	Drill Ø8.5mm
EAA A100	Drill Ø10mm
EAA A115	Drill Ø11.5mm
EAA A130	Drill Ø13mm
EAA R070	Rasp Ø7mm
EAA R085	Rasp Ø8.5mm
EAA R100	Rasp Ø10mm
EAA R115	Rasp Ø11.5mm
EAA R130	Rasp Ø13mm
EAA GC00	Humeral cutting guide
EAA C140	High angle corrector
EAA C141	Low angle corrector
EAA EH00	Humeral retractor
EAA EG01	Glenoid retractor
EAA EG02	Glenoid retractor
EAA PT00	T-handle
UH01/UH02	AO-handle
EAA CA00	Ablation wrench
EAA GCBG	Glenoid centering
EAA PP00	Humeral protector
EAA FG25	Glenoid ream Ø25mm
EAA FG30	Glenoid ream Ø30mm
EAA FG33	Glenoid ream Ø33mm
EAA FG36	Glenoid ream Ø36mm
EAA MF00	Ream handle
EAA TT35	3.5mm screwdriver
EAA TC35	3.5mm cannulated screwdriver
EAA PR00	Rasp holder
EAA VPR0	Screw for rasp holder
EAA FC01	Surface planer Ø40mm
EAA FC02	Surface planer Ø45mm
EAA FC03	Surface planer Ø50mm
EAA FCA0	Adapter 0° for surface planer
EAA FCA8	Adapter 8° for surface planer
EAAOE00	Interlocking tool

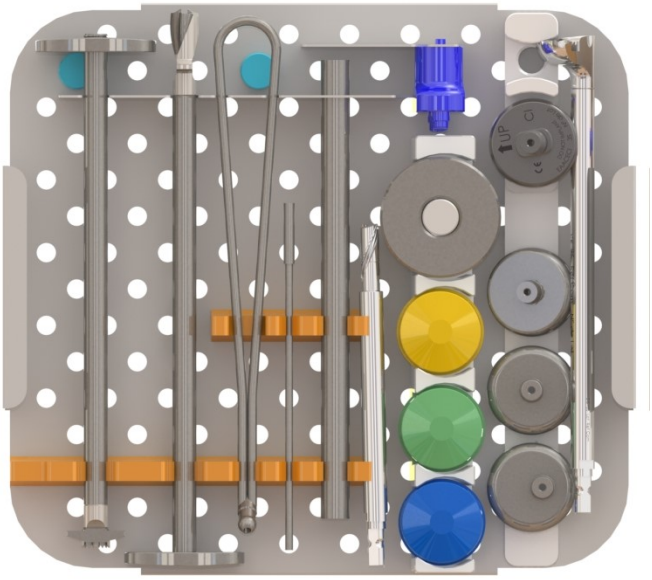
Commun tray



EAA TA00	Orientation stem
EAA EITH	Head impactor
EAA EIG0	Glenoid impactor
EAA MF04	Threaded AO handle
EAA PRV0	Retroversion plate
EAA MIU0	Impactor handle
EAA EIIS	Insert impactor
BNS-025T-100	Pin non-sterile Ø2.5mm L100mm

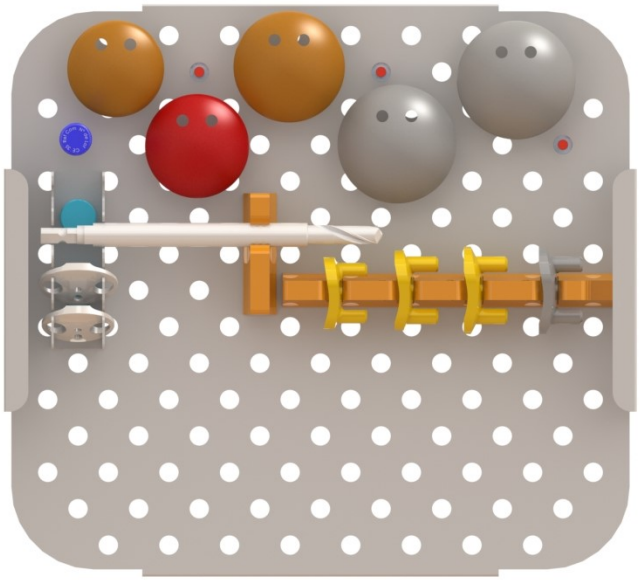
Instrument set

Reverse tray



EAA GP18	Drill guide 18mm
EAA GP21	Drill guide 21mm
EAA MB80	Drill bit with stop Ø8mm
EAA PS00	Stabilize
EAA TD40	Humeral head trial Ø40H13
EAA TD43	Humeral head trial Ø43H15
EAA TD46	Humeral head trial Ø46H17
EAA TD49	Humeral head trial Ø49H18
EAA TD50	Humeral head trial Ø49H20
EAA GE30	Glenoid trial Ø30mm
EAA GE33	Glenoid trial Ø33mm
EAA GE36	Glenoid trial Ø36mm
EAA GE00	Glenoid trial Ø36mm R34
26901	Glenoid holder
EAA C02H	ARAMIS case
EAA C02C	ARAMIS lid
EAA C02I	Reversed case
EAA C02A	Anatomical case
BS-025F-200	Pin sterile Ø2.5mm L200mm
EAA FG39	Peripheric ream Ø39mm
EAA FG43	Peripheric ream Ø43mm
EAA FL39	Peripheric ream Ø39mm for base-plate 25
EAA OM00	Helix preparator
EAA ODT0	Helicoidal chisel
EAA GM32	Drill guide Ø3.2mm
EAA M032	Drill Ø3.2mm
EAA MV00	Depth gauge
EAA MP80	Cannulated drill Ø8mm
EAA GI00	Baseplate impactor 28
EAA GI01	Baseplate impactor 25
EAA EA00	Anvil
EAA CEC0	Centered 0° trial cup
EAA CED0	Off-centered 0° trial cup
EAA CECI	Centered trial cup with angle corrector
EAA IE06	Insert trial 38/+6mm
EAA IE09	Insert trial 38/+9mm
EAA IE12	Insert trial 38/+12mm
EAA I406	Insert trial 42/+6mm
EAA I409	Insert trial 42/+9mm
EAA I412	Insert trial 42/+12mm

Anatomical tray



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Dispositif médical de classe III // Indication : arthroplastie de l'articulation gléno-humérale
Dispositif médical remboursé par la sécurité sociale

Consulter la technique opératoire avant utilisation *Lire attentivement la notice*

EAITOEN-Version4 09/2020