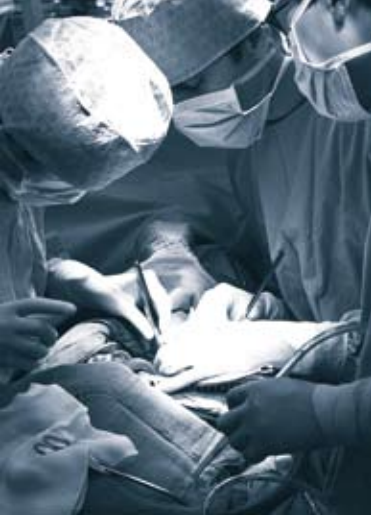

# Surgical Technique

Reversed Shoulder Prosthesis

## Aequalis®-Reversed Fracture

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TORNIER

SURGICAL IMPLANTS

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AEQUALIS®-REVERSED FRACTURE

## SPECIFICALLY DESIGNED FOR TUBEROSITY REDUCTION, FIXATION AND HEALING

### Single Metaphysis Diameter

Same cup diameter is used for the two articular diameters of 36 mm and 42 mm.

### Metaphysis Covered by HA-Coating

Enhances osteointegration.

### Low Profile Lateral Body

This allows anatomic positioning of tuberosities, facilitates reduction and preserves osseous tissue.

### Polished Tunnels

Facilitate tendon transfers and anchoring soft tissue.

### Polished Neck

Accomodates Aequalis suture technique and reduces risk of suture abrasion.

### Metaphysis Window

Allows for custom bone graft which promotes bony healing.

### Distal Grooved Stem

Enhances cement fixation and provides rotational stability.

### Monobloc Stem and Metaphysis

Monobloc stem eliminates the risk of disassociation.
12 sizes accomodate varying anatomy, including revision surgery.

### Lateralization Spacer

Optional 9 mm spacer allows increase in lateralization and height. Used with a polyethylene insert this spacer can increase the thickness to 15, 18 or 21 mm to increase deltoid tension.

### 36 and 42 mm dia. Polyethylene Inserts

Allows optimal deltoid tension and implant stability while avoiding risk of acromial impingement.
Both centered and constrained insert options are available in 6, 9 and 12 mm thicknesses.

## 1. INDICATIONS AND CONTRAINDICATIONS

The Aequalis®-Reversed Fracture Shoulder Prosthesis is indicated for patients with a functional deltoid muscle as a total shoulder replacement for the relief of pain or significant disability following arthropathy associated to a grossly deficient rotator cuff joint:

- In case of traumatic or pathologic conditions of the shoulder resulting in fracture of the glenohumeral joint, including humeral head fracture and displaced 3-or 4-part proximal humeral fractures, or
- In case of bone defect in the proximal humerus.

The Aequalis®-Reversed Fracture Shoulder Prosthesis is also indicated for prosthetic revisions with a grossly deficient rotator cuff joint when other treatments or devices have failed.

The Aequalis®-Reversed Fracture Shoulder humeral stem is used in association with the glenoid components of the Aequalis®-Reversed Shoulder Prosthesis.

The Aequalis®-Reversed Fracture Shoulder humeral stem is for cemented use only.

A complete list of contraindications can be found in the “Instructions For Use“ packaged with the implants.

## 1. PREOPERATIVE PLANNING

Thorough patient evaluation with history and physical examination is advised.

Evaluation of the contralateral shoulder should be done since there can be limited range of rotation with a reversed prosthesis. The deltoid muscle must be evaluated by clinical examination. Weakness of the deltoid does not constitute a strict contraindication to a reversed fracture prosthesis.

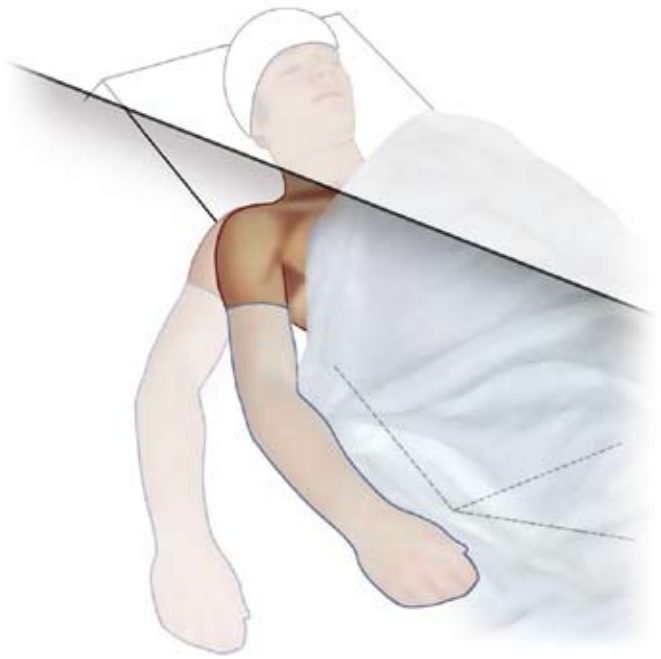
The preoperative studies should include computed tomographic (CT) scan to classify the fracture, determine the displacement and status of the tuberosities, evaluate indirectly the status of the rotator cuff by analysis of fatty infiltration of the muscles and assess the glenoid bone stock.

Bilateral X-rays of the whole humerus allow evaluation of bone loss in comminuted fractures and help the surgeon estimate the approximate stem height of the prosthesis by comparing measurements of the contralateral side of the humerus with measurements of the fractured side.

## 2. PATIENT POSITIONING

Patient is placed in a beach chair position with the shoulder off the table.

The patient is vertically inclined to the angle determined according to the surgical approach selected.



## 3. SURGICAL APPROACH

The superolateral approach is usually recommended for these cases.

Patient is placed in a beach chair position.

A longitudinal incision is made, starting from the acromio-clavicular ligament and running distally for 4 cm following the anterior edge of the acromion. The anterior and middle deltoid muscles are separated with respect to the lateral edge of the acromion.

It is important to be careful with the dissection to avoid an axillary nerve injury since this nerve is found about 4 cm away on the lateral side of the acromion. (Fig. 1)

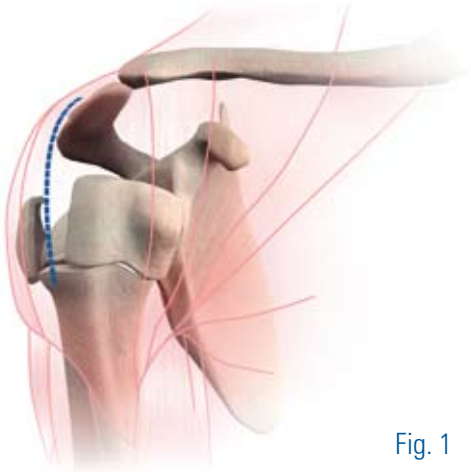


Fig. 1

The deltopectoral approach can also be used.

## 4. FRACTURE EXPOSURE

The first step is to identify the fracture fragments. (Fig. 2)

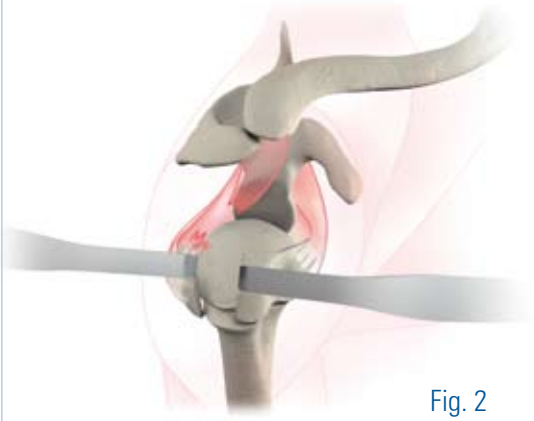


Fig. 2

Once the fragments have been identified the supraspinatus is resected to the glenoid rim.

The humeral head fragment is removed and a tenotomy of the long head of the biceps is done. The intra-articular portion is then resected.

The ligament will be tenodesed with suture to the transverse ligament before closing.

The greater tuberosity is mobilized posteriorly and four mattress sutures (green and rose colored) are placed from outside to inside by means of a crimping suture needle. (Fig. 3)

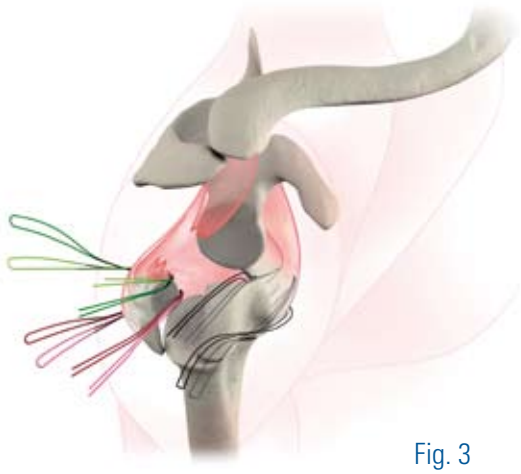


Fig. 3

The lesser tuberosity is identified anteriorly and a suture is placed through the subscapularis tendon to facilitate its manipulation at the time of fixation of the tuberosities. (Fig. 3, gray suture)

The lesser tuberosity is retracted anteriorly for glenoid exposure.

## 5. GLENOID EXPOSURE AND PREPARATION

The characteristics of the fracture usually allow easy exposure of the glenoid (Fig. 4).

The various surgical steps for exposure and implantation of the baseplate and glenoid sphere are described in the Surgical Technique of Aequalis®-Reversed (UDRT and UDXT):

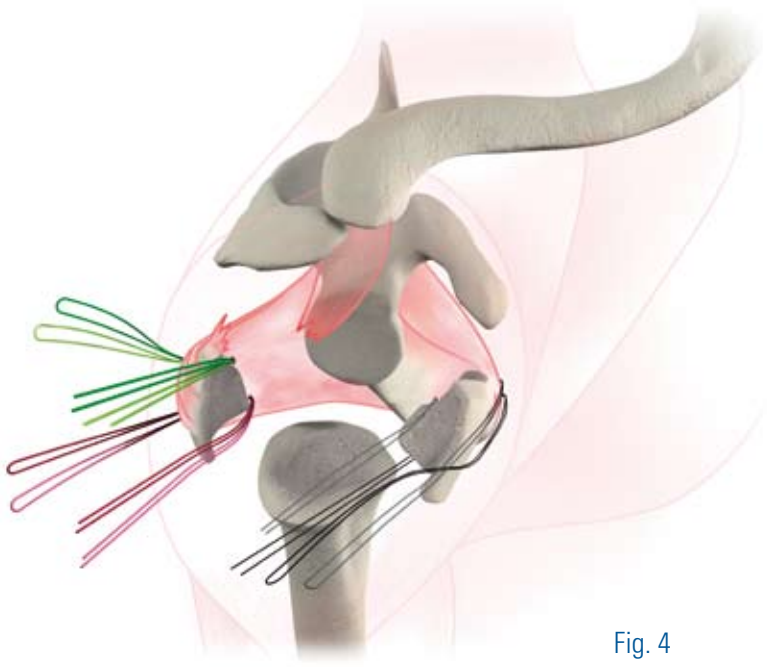


Fig. 4

**NOTE :**

- Instability is a considerable risk when a reversed prosthesis is used for fracture as a result of:
  - Deltoid atony
  - Lack of reliable anatomic landmarks.

- To avoid instability:
  - Inferiorly position the base plate.
  - Position the humeral implant the correct height using the greater tuberosity as a landmark. The prosthesis should not be implanted lower than than the superior edge of the greater tuberosity.
  - The greater tuberosity must be reduced with the arm in neutral position.

## 6. PREPARATION OF THE HUMERUS

### 6.1 Humeral Reaming

The medullary canal of the humeral shaft is progressively reamed with reamers of increasing diameter (7, 9, 11, 13, 15 mm) until the reamer contacts the cortical bone. (Fig. 5)

Fig. 5

The last reamer used determines the size of the humeral stem.

Each diameter corresponds to a color code that easily identifies which instrument to use. (Fig. 6)

The reamers are marked at depths that correspond to the necessary reaming length according to the chosen stem.

Fig. 6

NOTE: In case of revision, it is important to remove as much cement residue as possible to not interfere with tuberosity consolidation.

### 6.2 Drilling of Diaphyseal Sutures Holes

Two holes are drilled laterally in the bicipital groove 2 cm under the fracture site. Two nonabsorbable sutures are passed from outside to inside and then from inside to outside. (Fig. 7)

Fig. 7

## 6.3 Positioning the Trial Stem

### 6.3.1 Retroversion

The trial stem is introduced in the medullary canal.

Adjust the retroversion with the retroversion rod. It has to be parallel to the patient's forearm. The guide retroversion is adjusted to 20° relative to epicondyles (25° in relation to the forearm).

The second retroversion rod can be used as an orthogonal landmark by placing it on the wrist.

A mark is made with electrocautery at the lateral fin of the stem and will be used as a landmark to position the definitive implant. (Fig. 8 - zoom 1)

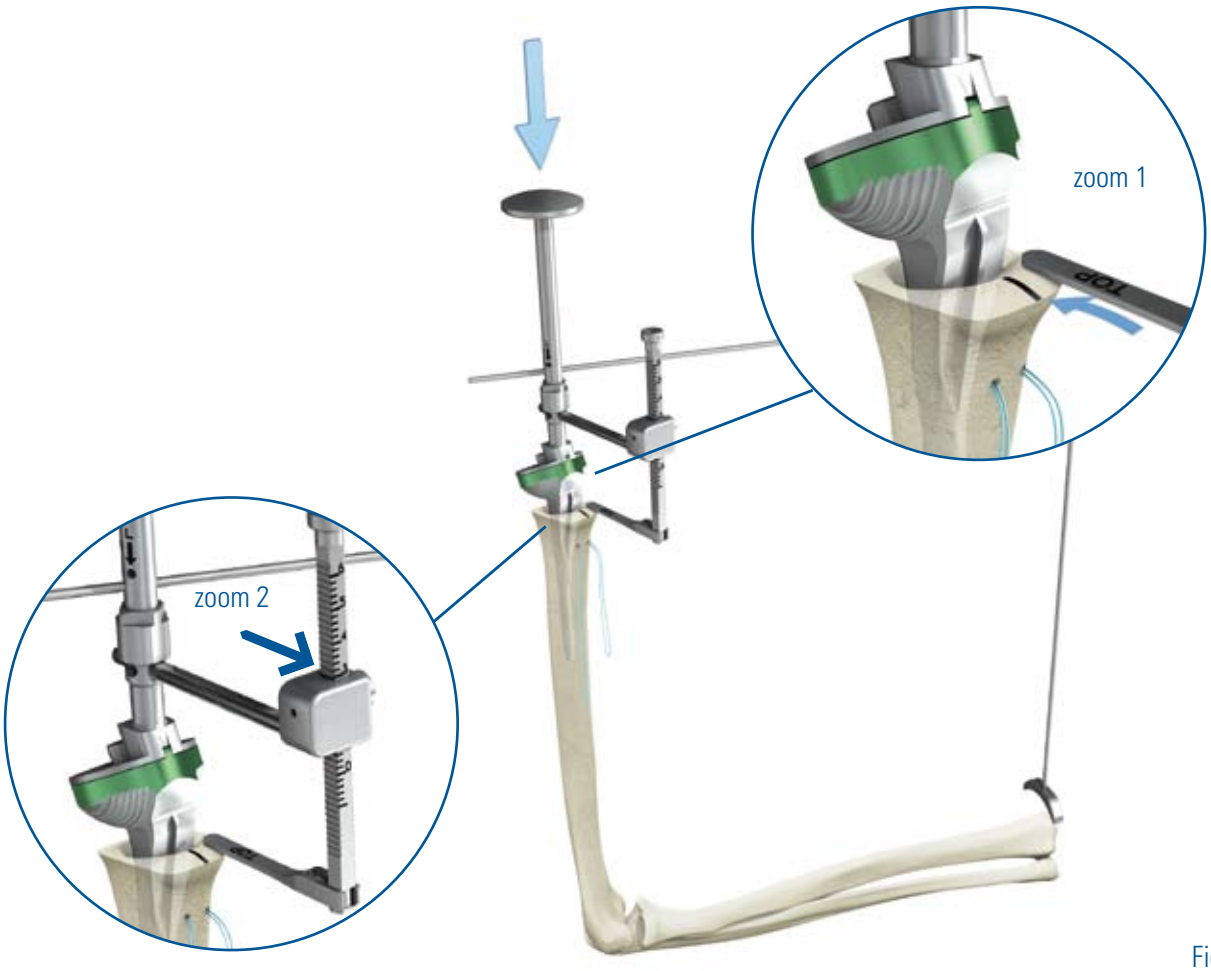



Fig. 8

NOTE: The assembly of the guide is detailed pages 22-23.

### 6.3.2 Selecting Height

To select the proper height, place the superior aspect of the trial implant to the superior edge of the reduced greater tuberosity. (Fig. 9)

Inspect the reduction of the greater tuberosity for confirmation of proper positioning of the stem.

The reduction with trial implant can be done once the prosthesis holder is removed.

The prosthesis must be stable upon insertion and before the tuberosities can be reduced.

If the stem sits too low insert the next larger trial.

Once the appropriate height has been acheived, position the height gauge on an anatomic landmark. The height is then read on the ruler. (Fig. 8 Zoom 2)

This reference will be used again when the final implant is put into place.

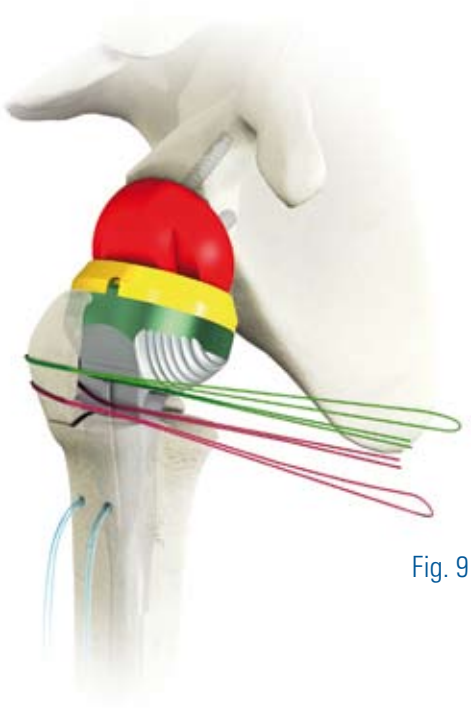


Fig. 9

## 6.4 Placing the Bone Graft

Bone grafting is recommended to enhance consolidation of the tuberosities.

Two bone grafts are harvested from the humeral head in the bone graft cutter. In case of revision, or if the bone quality of the humeral head is not sufficient, autografts or allografts can be used.

Prior to cutting the graft, ensure that the thumb screw is unscrewed. The humeral head is positioned into the accurate space of the bone graft cutter. (Fig. 10)

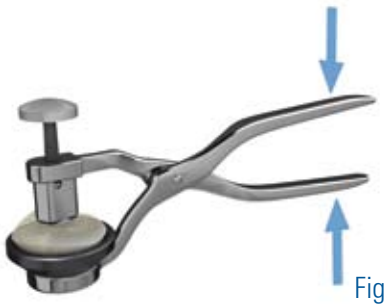


Fig. 10

The graft is cut by firmly tightening the handle.

In the case of exceptionally hard bone, a mallet can be used to strike the clamp.

The dural part of the harvested graft is cut with a gouge-forceps before it is removed. (Fig. 11)

Fig. 11

Tightenen the thumb screw to remove the graft. (Fig. 12)

Fig. 12

Once cut, the graft is placed in the window of the final prosthesis before it is placed in the humerus. (Fig. 13)

Fig. 13

## 6.5 Cementing the Implant

After placing the diaphyseal plug, the humeral canal is dried and cement is injected using a large syringe.

A surgical drain can be temporarily placed in the medullary cavity. (Fig. 14)

Fig. 14

## 6.6 Placement of Final Humeral Implant

Insert the final prosthesis using the prosthesis holder. Adjust the height to the same level as defined during the trial process.

Adjust retroversion by aligning the lateral fin of the prosthesis with the previously made mark. This is then confirmed using the retroversion rod attached to the prosthesis holder. (Fig. 15)

Excess cement is removed with a curette.

Fig. 15

## 6.7 Impaction of Humeral Insert

After the cement is dry, the selected polyethylene insert is positioned by aligning the insert's orientation notch with the metaphyseal pin.

Reduction with different sizes of trial humeral inserts can be done to find the best muscular stability.

Once the final thickness is selected, the metaphyseal component is thoroughly cleaned and dried.

Insert a metaphyseal plug and screw it into the base of the metaphysis.

The final insert is impacted into the metaphysis or on the lateralized spacer with the humeral insert impactor. (Fig. 16a, b, c)

The prosthesis is then reduced.

If reduction is difficult, a prosthesis reducer can be used.

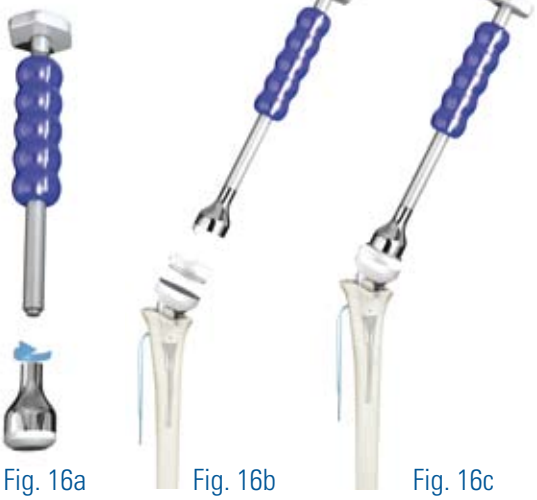


Fig. 16a Fig. 16b Fig. 16c

NOTE: If a lateralization spacer is used, the spacer is impacted into the metaphyseal cup with the humeral cap adaptor impactor.

After impaction, the central securing screw is inserted and fully tightened with the 3.5 mm screwdriver, thus securing the spacer onto the metaphysis.

## 6.8 Reduction of Implant

Sutures are placed around the prosthesis neck at the level of the polished area. The prosthesis is then reduced into the joint.

## 6.9 Tuberosities Fixation

### 6.9.1 Place Horizontal Cerclage Sutures around the Greater Tuberosity

Fixation of the tuberosities begins with fixation of the greater tuberosity.

The arm is placed in neutral position. A clamp is used to pull the greater tuberosity anteriorly, reducing the greater tuberosity to the prosthesis. Two horizontal cerclage sutures (one superior, one inferior) are then tied to secure the greater tuberosity to the prosthesis. (Fig. 17a, b)

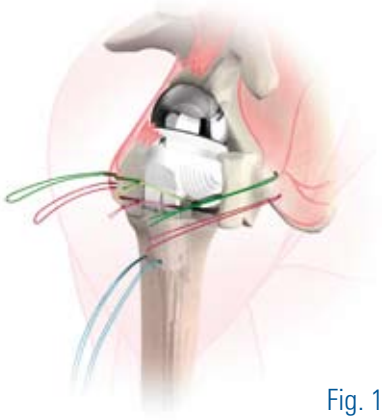


Fig. 17a

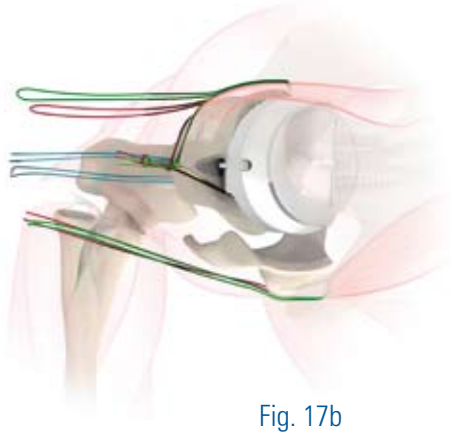


Fig. 17b

### 6.9.2 Place Horizontal Cerclage Sutures around Greater and Lesser Tuberosities

The next step is to reduce the lesser tuberosity.

The two remaining horizontal sutures, which had initially been passed through the posterior rotator cuff tendon and around the prosthetic neck, are then passed through the subscapularis tendon.

One runs through the superior portion and the other through the inferior portion. Both sutures are passed from inside to outside and are then tied.

The sutures thereby give lateral stability to the tuberosities. (Fig. 18a, b)

Fig. 18a

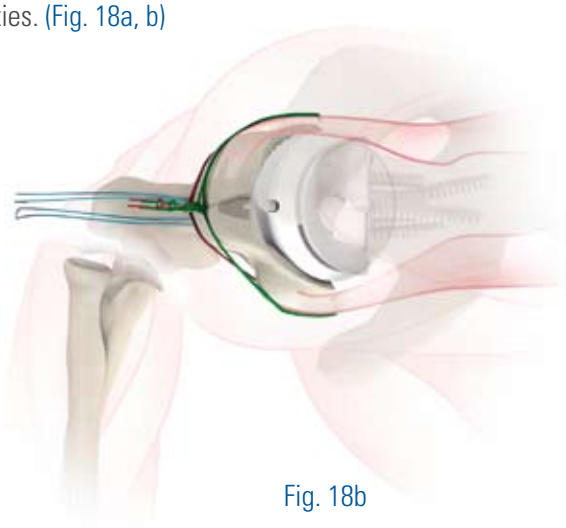


Fig. 18b

### 6.9.3 Secure the Greater and Lesser Tuberosities

Final tightening creates a vertical support from the diaphysis by means of a nonabsorbable suture. The shroud goes behind the infraspinatus and in front of the subscapularis. It is then tied.

This technique provides solid and reproducible fixation of the tuberosities on to the diaphysis . (Fig. 19)

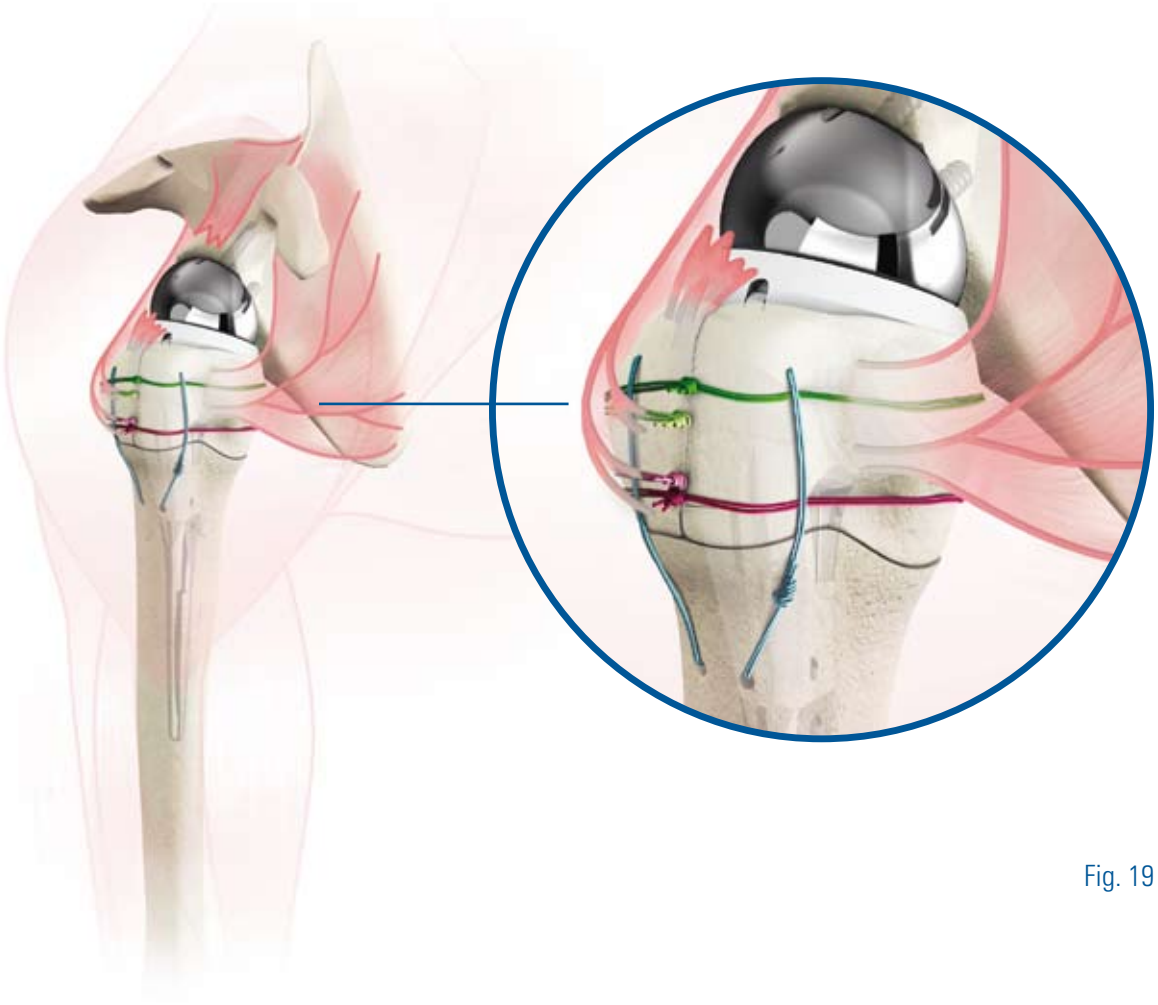


Fig. 19

### 6.9.4 Tenodesis of the Long Head of the Biceps

After resecting the intra-articular portion of the long head of the biceps, a nonabsorbable suture is passed through the tendon of the long head of the biceps. It is then reinserted in the bicipital groove.

## 6.10 Trial and Closure

### Peri-operative Trial

**Pull the arm away from the body** after reduction and fixation of tuberosities to ensure that there is no "pistoning" effect. Complete separation of the prosthesis while pulling indicates inadequate tensioning of the deltoid.

**Abduction of the arm** is performed to check that there is no impingement and that anterior elevation and abduction have been restored.

**External rotation with the elbow at the side (ER-1)** assesses passive external rotation.

**External rotation with the elbow abducted (ER-2)** assesses the risk of possible future subluxation.

**Internal rotation with the elbow at the side (IR-1) and in abduction (IR-2).** Forearm must be parallel to the thorax for IR-2 trial. This reflects the patient's future ability to move the hand to the back.

**Adduct the arm** to check that there is no impingement between the pillar of the scapula and the humeral implant.

After reduction of the prosthesis, the coraco-biceps tendon should usually have sufficient muscular tension.

### Closure

In the superolateral approach, the anterior deltoid is reattached to the acromion with a trans-osseous nonabsorbable suture.

In the deltopectoral approach, full or partial reinsertion of the subscapularis is performed if possible.

Be prepared to place a surgical drain in the sub-acromial space to reduce the risk of hematoma, as it is common in fracture cases.

## 7. REHABILITATION

The arm is placed in a **brace with the elbow close to the body** in neutral or internal rotation.

An **abduction splint** can be used, especially in cases of anterior deltoid detachment when the superolateral surgical approach was used.

**Plan early rehabilitation adapted to the status of the patient's bony structures and soft tissues.**

- **Strengthen the Deltoid Starting** from the sixth week with active exercises against resistance.
Strengthen external rotators with elbow close to body by means of isometric exercises against resistance.
If the deltoid attachment has not been disrupted, mobility is usually rapidly recovered.

- **Reduce the Risk of Subluxation:**
Retropulsion and external rotation must absolutely be avoided postoperatively, especially when the patient is in decubitus position.

## 8. COMPLICATIONS

### Postoperative Stiffness

In case of significant preoperative stiffness, it may be difficult to regain mobility postoperatively.

Surgical arthrolysis in conjunction with capsulotomy may be required with the removal of soft tissue adhesions and possibly removal of the tuberosities.

Postoperatively, the arm is usually immobilized in a shoulder abduction splint in 60 degrees abduction. Passive elevation above the splint in the scapular plane is started immediately.

### Prosthesis Instability

This is the consequence of insufficient deltoid tension. Possible causes:

- Stem positioned too low
- Sphere positioned too high.

Good synthesis of the tuberosities increases the joint stability.

**In case of early postoperative dislocation,** closed reduction under general anesthesia is performed. If the prosthesis is in good position with retroversion and good overall fracture alignment, then immobilization for 6 weeks normally restores stability of the prosthesis.

**With early recurrence of instability,** surgical revision is needed to check the position of the prosthesis. Increase the humeral lateralization as necessary by adding a lateralized spacer at the level of the humeral implant.

### Scapula Notch

Impingement between the pillar of the scapula and the humeral implant can lead to scapular bone erosion resulting in a scapular notch. This notch usually does not affect function or mobility. X-ray follow-ups are recommended.

### Absence of Active External Rotation

The absence of the teres minor and infraspinatus due to tendon cuff tear or fatty infiltration may be the cause of loss of active external rotation.

In this case one may consider a latissimus dorsi transfer to the greater tuberosity of the humerus performed at the same time as the Aequalis®-Reversed Fracture prosthesis procedure.

## 9. AEQUALIS®-REVERSED HEMI-PROSTHESIS ADAPTOR TECHNIQUE

### Indications

When during the primary surgery the glenoid bone stock appears to be insufficient to bear the reversed glenoid components or when glenoid bone fracture occurs during the surgical procedures, the hemiprosthesis adaptor and the union screw can be adapted to the humeral components in order to transform the Aequalis®-Reversed Fracture Shoulder Prosthesis into a hemi-prosthesis.

When, in case of revision of a Aequalis®-Reversed Fracture Shoulder Prosthesis, the glenoid bone stock appears to be insufficient to implant a base plate and a sphere of Aequalis®-Reversed range again, the use of the hemi-prosthesis adaptor and the union screw allows for the transformation of the Aequalis®-Reversed Fracture Shoulder Prosthesis into a hemi-prosthesis in order to avoid the revision of the humeral components.

## 9.1 Preparation of Metaphyseal Implant

Remove the polyethylene implant with an osteotome. (Fig. 20)

Fig. 20

## 9.2 Affixing Union Screw

Union screw is screwed into the metaphysis. Tighten the screw with a 14 mm wrench (Fig. 21) or with the wrench for metaphyseal plug associated with a 4.5 mm screwdriver.

Fig. 21

## 9.3 Implantation of Adaptor

Clean the inner part of the metaphysis carefully.

The hemi-prosthesis impactor is screwed into the handle of the humeral insert impactor.

Be sure to position the adaptor notch in line with the metaphyseal plug.

The adaptor is then impacted with the hemi-prosthesis impactor. (Fig. 22)

Fig. 22

## 9.4 Impaction of Humeral Head

After the adaptor is in place, the exposed tapered cone is carefully dried and cleaned.

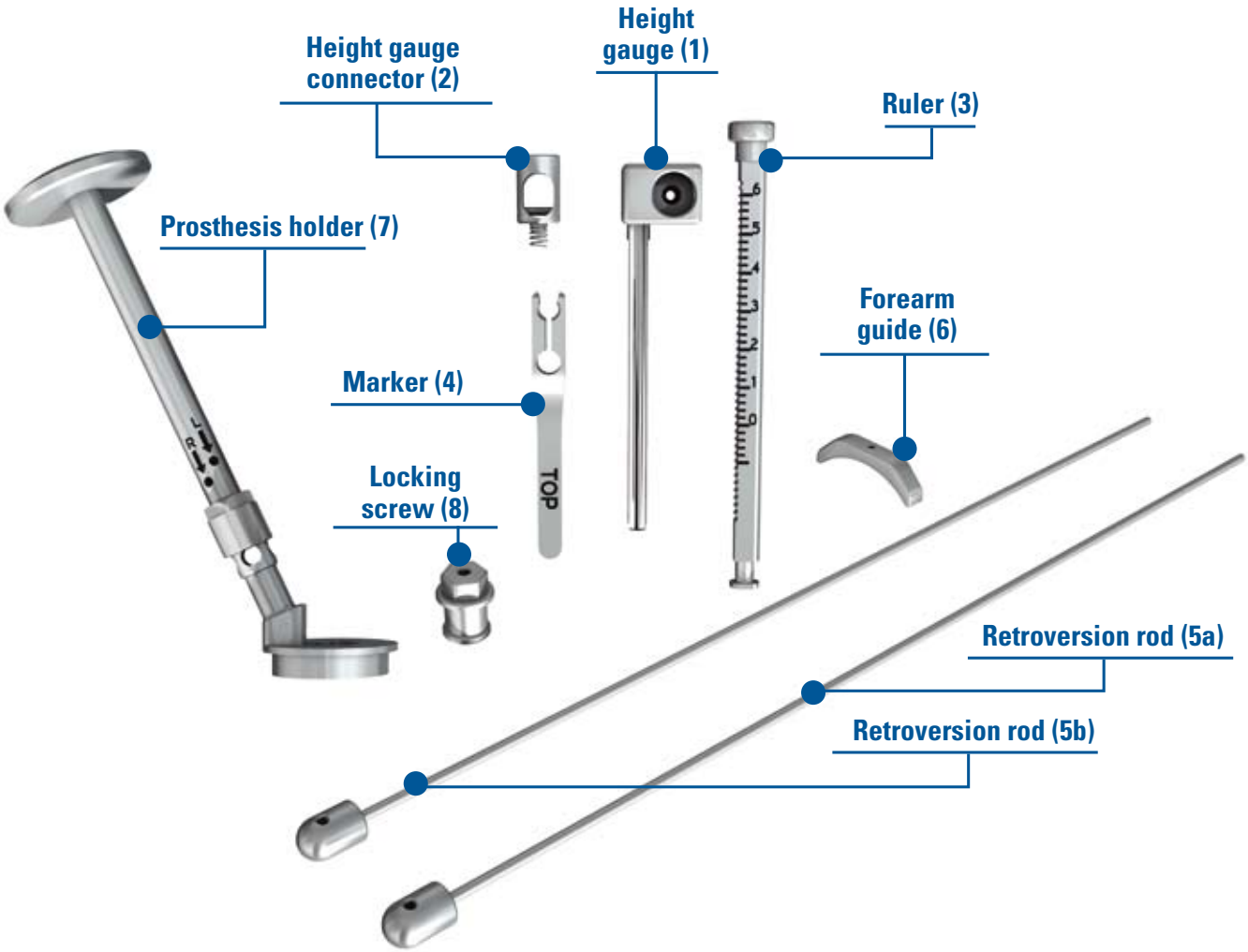
The Aequalis® adaptor cap of the selected diameter is impacted on the tapered cone of the union screw using the glenoid sphere impactor. (Fig. 23a-b)

Fig. 23a

Fig. 23b

## 10. ASSEMBLY OF PROSTHESIS HOLDER

### 10.1 Prosthesis Holder Components




NOTE: Height gauge and retroversion rod are assembled onto the stem holder depending on operative side and chosen approach.

## 10.2 Assembly of Height Gauge

Assemble the height gauge **(1)** with the height gauge connector **(2)**. (Fig. 24)

Push the release button on the tip of the height gauge connector to insert the height gauge ruler **(3)**.

Assemble the height gauge marker **(4)** onto the height gauge ruler **(3)**.

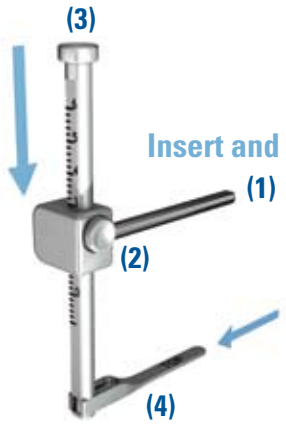



Fig. 24

## 10.3 Assembly of Prosthesis Holder

Connect the height gauge to prosthesis holder **(7)** and secure the device with locking screw.

Two positions (Fig. 25 a-b) are possible according to surgical approach used.

Secure the assembly to the trial stem or final stem with the locking screw **(8).**

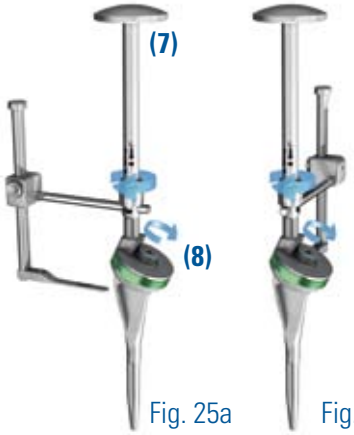



Fig. 25a Fig. 25b

## 10.4 Assembly of Retroversion Rod

Connect retroversion rod **(5b)** to retroversion rod **(5a)** and attach the forearm guide **(6)**. (Fig. 26)

Identify the appropriate side (L for Left and R for right) and attach the retroversion rod **(5a)** to prosthesis holder **(7)**. (Fig. 27)

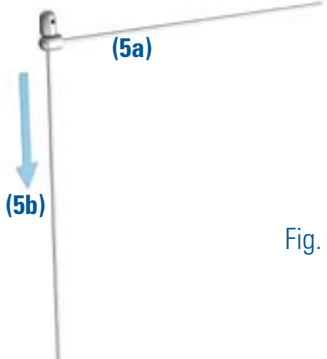



Fig. 26

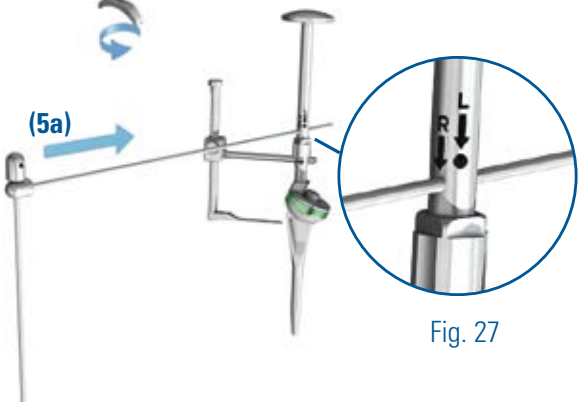



Fig. 27

# COLOR CODING

## Humeral Side

| Trial Insert | Color | Reference |
|---|---|---|
| Ø 36 mm centered + 6 mm | Yellow | MWD060 |
| Ø 36 mm centered + 9 mm | | MWD061 |
| Ø 36 mm centered + 12 mm | | MWD062 |
| Ø 36 mm constrained + 6 mm | Black | MWD970 |
| Ø 36 mm constrained + 9 mm | | MWD971 |
| Ø 36 mm constrained + 12 mm | | MWD972 |
| Ø 42 mm centered + 6 mm | Green | MWB985 |
| Ø 42 mm centered + 9 mm | | MWB986 |
| Ø 42 mm centered + 12 mm | | MWB987 |
| Ø 42 mm constrained+ 6 mm | Black | MWD973 |
| Ø 42 mm constrained + 9 mm | | MWD974 |
| Ø 42 mm constrained + 12 mm | | MWD975 |

### Trial Inserts

# COLOR CODING

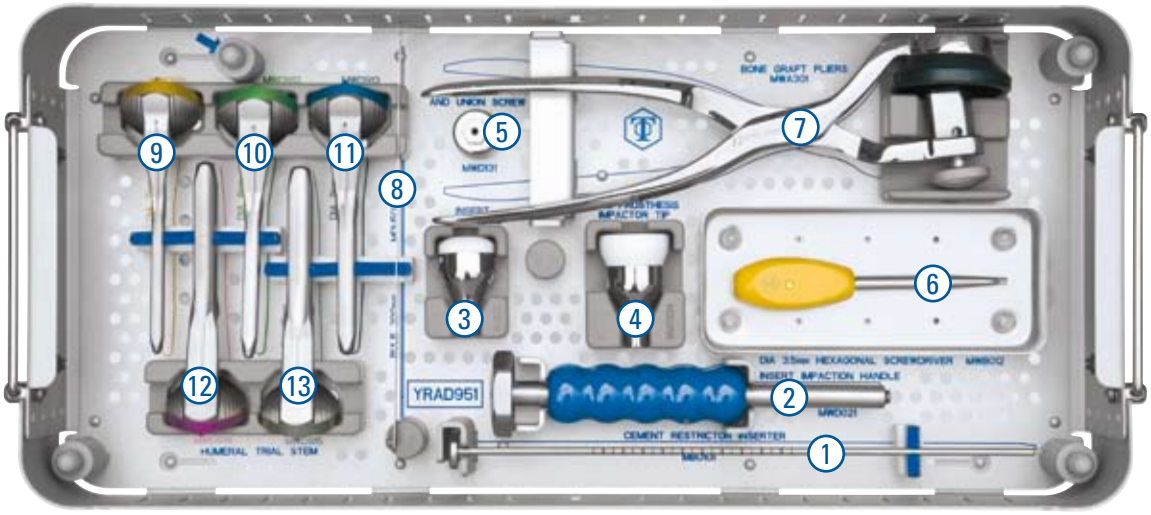


| Diameter | Color | Ref. Reamers | Ref. Trial Stems | Ref. Final Stems | Ref. Long Stems | | |
|---|---|---|---|---|---|---|---|
| | | | | | L 170 mm | L 180 mm | L 210 mm |
| Ø 7 mm | Yellow | MWD211 | MWD911 | DWD911 | DWD941 | | |
| Ø 9 mm | Green | MWD212 | MWD912 | DWD912 | | DWD942 | DWD961 |
| Ø 11 mm | Blue | MWD213 | MWD913 | DWD913 | | DWD943 | DWD962 |
| Ø 13 mm | Pink | MWD214 | MWD914 | DWD914 | | DWD944 | DWD963 |
| Ø 15 mm | Gray | MWD215 | MWD915 | DWD915 | | | |

## Reamers


## Trial Stems

## Instrumentation - Humeral YKAD95




**Ref. YRAD951**

### Cases

| Description | Reference | Quantity |
|---|---|---|
| Box / base | YRAD951 | 1 |
| Box / insert | YRAD952 | 1 |
| Box lid | NCR009 | 1 |

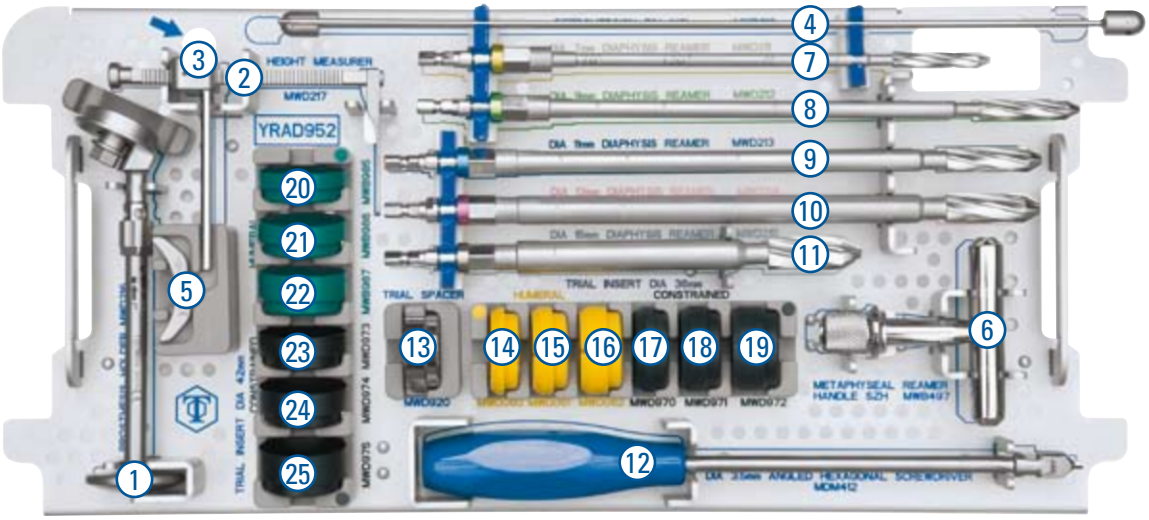
### Instrumentation

| N° | Description | Reference | Quantity |
|---|---|---|---|
| 1 | Plug positioner | MBO101 | 1 |
| 2 | Humeral insert impaction handle | MWD021 | 1 |
| 3 | Tip for humeral insert impaction | MWD023 | 1 |
| 4 | Tip for impaction of hemi-prosthesis adaptor | MWD024 | 1 |
| 5 | Wrench for metaphyseal plug and union screw | MWD131 | 1 |
| 6 | Screwdriver 4.5 mm | MWB012 | 1 |
| 7 | Bone graft pliers | MWA301 | 1 |
| 8 | Ruler 200 mm | MDU502 | 1 |

### Trial stem instrumentation

| N° | Description | Reference | Quantity |
|---|---|---|---|
| 9 | Humeral trial stem Ø 7 mm | MWD911 | 1 |
| 10 | Humeral trial stem Ø 9 mm | MWD912 | 1 |
| 11 | Humeral trial stem Ø 11 mm | MWD913 | 1 |
| 12 | Humeral trial stem Ø 13 mm | MWD914 | 1 |
| 13 | Humeral trial stem Ø 15 mm | MWD915 | 1 |

## Instrumentation - Humeral YKAD95




**Ref. YRAD952**

### Instrumentation

| N° | Description | Reference | Quantity |
|---|---|---|---|
| 1 | Prosthesis holder | MWD216 | 1 |
| 2 | Height gauge | MWD217 | 1 |
| 3 | Marker | MWD220 | 1 |
| 4 | Retroversion rod | MWD218 | 2 |
| 5 | Forearm guide | MWD219 | 1 |
| 6 | Metaphyseal reamer handle | MWB497 | 1 |
| 7 | Diaphyseal reamer Ø 7 mm | MWD211 | 1 |
| 8 | Diaphyseal reamer Ø 9 mm | MWD212 | 1 |
| 9 | Diaphyseal reamer Ø 11 mm | MWD213 | 1 |
| 10 | Diaphyseal reamer Ø 13 mm | MWD214 | 1 |
| 11 | Diaphyseal reamer Ø 15 mm | MWD215 | 1 |
| 12 | Screwdriver 4.5 mm | MDM412 | 1 |

### Instrumentation Ø 36 mm

| N° | Description | Reference | Quantity |
|---|---|---|---|
| 13 | Trial humeral spacer + 9 mm | MWD920 | 1 |
| 14 | Trial humeral insert Ø 36 mm + 6 mm | MWD060 | 1 |
| 15 | Trial humeral insert Ø 36 mm + 9 mm | MWD061 | 1 |
| 16 | Trial humeral insert Ø 36 mm + 12 mm | MWD062 | 1 |
| 17 | Constrained trial insert Ø 36 mm + 6 mm | MWD970 | 1 |
| 18 | Constrained trial insert Ø 36 mm + 9 mm | MWD971 | 1 |
| 19 | Constrained trial insert Ø 36 mm + 12 mm | MWD972 | 1 |

### Instrumentation Ø 42 mm

| N° | Description | Reference | Quantity |
|---|---|---|---|
| 20 | Humeral trial insert Ø 42 mm + 6 mm | MWB985 | 1 |
| 21 | Humeral trial insert Ø 42 mm + 9 mm | MWB986 | 1 |
| 22 | Humeral trial insert Ø 42 mm + 12 mm | MWB987 | 1 |
| 23 | Constrained trial insert Ø 42 mm + 6 mm | MWD973 | 1 |
| 24 | Constrained trial insert Ø 42 mm + 9 mm | MWD974 | 1 |
| 25 | Constrained trial insert Ø 42 mm + 12 mm | MWD975 | 1 |

# IMPLANTS



## Humeral Implants

### Aequalis®-Reversed Fracture Stems

| Diameter | Length | Reference |
|---|---|---|
| 7 mm | 130 mm | DWD911 |
| 9 mm | 130 mm | DWD912 |
| 11 mm | 130 mm | DWD913 |
| 13 mm | 130 mm | DWD914 |
| 15 mm | 130 mm | DWD915 |
| Metaphyseal Plug | | DWB010 |

### Aequalis®-Reversed Fracture Long Stems*

| Diam.\L | 170 mm | 180 mm | 210 mm |
|---|---|---|---|
| 7 mm | DWD941 | | |
| 9 mm | | DWD942 | DWD961 |
| 11 mm | | DWD943 | DWD962 |
| 13 mm | | DWD944 | DWD963 |

### Lateralized Humeral Inserts

| Diameter | Thickness | Reference |
|---|---|---|
| 36 mm | + 6 mm | DWD860 |
| 36 mm | + 9 mm | DWD861 |
| 36 mm | + 12 mm | DWD862 |
| 42 mm | + 6 mm | DWD866 |
| 42 mm | + 9 mm | DWD867 |
| 42 mm | + 12 mm | DWD868 |

### Constrained Humeral Inserts*

| Diameter | Thickness | Reference |
|---|---|---|
| 36 mm | + 6 mm | DWD970 |
| 36 mm | + 9 mm | DWD971 |
| 36 mm | + 12 mm | DWD972 |
| 42 mm | + 6 mm | DWD973 |
| 42 mm | + 9 mm | DWD974 |
| 42 mm | + 12 mm | DWD975 |



### Humeral Spacer

| Description | Reference |
|---|---|
| Humeral spacer + 9 mm including tightening screw | DWD920 |

### Hemi-prosthesis

| Description | Diameter | Height | Reference |
|---|---|---|---|
| Hemi-prosthesis adaptor | - | - | DWD922 |
| Including union screw metaphysis / adaptor | - | - | DWD923 |
| Humeral Head CoCr | 50 mm | 19 mm | DWB251 |
| Humeral Head CoCr | 52 mm | 23 mm | DWB253 |

* Special request only

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