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Operative summary

a. Femoral neck osteotomy
b. Femoral canal preparation
c. Intra-medullary (IM) reamer
d. Sequential rasping
e. Calcar preparation
f. Trial reduction
g. Stem implantation
h. Femoral head impaction
1. Pre-operative planning

Pre-operative planning should normally be carried out, to provide an indication of stem size and neck option to restore the anatomical centre of rotation. In some instances consideration may be given to preparing the femur first and leaving the provisional final rasp in situ prior to preparing the acetabulum. This can allow time for stress relaxation within the femur, if this occurs the final rasp may become less stable after acetabular preparation. The rasp may at this point be deemed to be under-sized and this is remedied by simply up-sizing via continued sequential rasping.

2. Femoral neck osteotomy

While pre-operative templating will help define the position of the osteotomy, the neck resection guide provides additional intra-operative guidance. The guide is placed so that the long axis of the instrument is in line with the long axis of the femur, and may be secured with pins if required.

Using diathermy, a line is marked on the femoral neck at 50° to the long axis through the slot. Alternatively, one of the smaller rasps can be overlaid on the femur to orientate the diathermy mark. Again, the long axis of the instrument and the femur are aligned and the angled face of the rasp can then be used to make the required diathermy mark. The osteotomy is performed using the diathermy line to help maintain the correct resection angle.

3. Femoral canal preparation

Remove any pins that may have been used to secure the neck resection guide.

A range of handles are provided to suit the chosen surgical approach or philosophy. The modular box osteotome is attached to the chosen handle and used to enter the femoral canal and to establish version.

Consideration may be given to lateralising the opening into the femur during this step so as to avoid incorrect varus alignment and undersizing issues.

*The removed cancellous bone is retained as this may be required for bone grafting later in the procedure.
4. Intra-medullary (IM) reamer
The T-handled reamer is used to define the neutral axis of the femoral canal. It is important to create an open pathway to the appropriate depth. This reduces the risk of distal hang-up which can lead to undersizing and improper seating of the stem.
If excessive resistance is felt at this stage this is normally due to slight varus instrument alignment which can be corrected by lateralising the proximal part of the IM reamer further into the greater trochanter prior to moving on to sequential rasping.

5. Sequential rasping
The chosen handle should be attached to the starter rasp and inserted/impacted into the femur, making sure that axial and rotational alignment is maintained at all times. Progressively larger rasps are then used to create an appropriately-sized cavity for receiving the definitive implant. The growth between adjacent rasp sizes is uniform to make sequential rasping more predictable and reproducible. Rasping should be continued while bearing in mind the required size determined during templating, until the tone of impaction changes and the desired axial stability is achieved via medial and lateral cortical contact within the proximal femur. The tommy bar can be used to check and correct the anteversion of the rasps during the above steps.
Note that the proximal face of the final rasp corresponds with the proximal margin of the porous coating on the definitive stem. Rotational stability may also be checked at this stage. The rasps (like the definitive stem) have a common medial radius and are designed to create a press-fit of approximately 0.2 to 0.3mm per face proximally and are over-sized distally to avoid distal impingement.
6. Calcar preparation
Ø40mm and Ø50mm calcar reamers are available. Locate the appropriate calcar reamer onto the spigot of the final rasp to remove excess bone from the resected neck. The calcar reamer will remove any bone that protrudes 0.25mm or more above the face of the rasp. Initiate power to the calcar reamer prior to careful engagement with the bone to prevent damage to the femur.

If the femoral neck has been resected inaccurately, calcar reaming may be useful as the reamed calcar region can be used to determine whether the stem is seated to the expected level, i.e. so that the proximal margin of the stem's porous coating sits flush with the neck resection.

7. Trial reduction
Attach the appropriate head and neck trials to the rasp in situ and perform a trial reduction to assess stability, offset and leg length. If the leg has been lengthened so that it cannot be managed easily with the available head options, consideration should be given to carefully countersinking the appropriate rasp or modifying the neck resection and repeating steps 4 to 6.

Note that the trial head should be removed from the trial neck by twisting through 90 degrees.
8. Stem implantation
The final rasp size indicates the definitive implant size. Once the final rasp is removed, suction may be applied but lavage of any kind should be avoided. The stem may be inserted by hand and impacted with the non-threaded introducer (Fig. 1) or held captive by screwing on the introducer/handle assembly by hand only (Fig. 2). The tommy bar can be used to release the stem if necessary.

Care should be taken to avoid soft tissue and/or bony impingement around the greater trochanter as this may impede stem insertion or cause it to adopt an off-axis orientation. It is therefore important to ensure that soft tissue is retracted and/or bony obstacles are removed adequately to allow the stem to seat fully and in the correct orientation.

Once the stem is seated, cancellous bone from the resected femoral head or the box osteotome can be impacted around the proximal stem using a tamp. This helps seal the femoral canal and may enhance the primary mechanical stability of the stem.

A trial head is used to perform a trial reduction to check for joint stability and leg length.

9. Femoral head impaction
Once the acetabular cup is implanted, but before placing the definitive head on the stem, the stem taper should be thoroughly rinsed and carefully dried to ensure that it is free from debris. The head is then placed on the stem taper by twisting lightly and by applying axial manual pressure until it is seated firmly. The plastic head impactor is placed on the pole of the head and impacted with a light tap using a hammer in an axial direction.

⚠️ Never use a metal hammer directly on the surface of the definitive head, only the plastic head impactor provided.

The hip can then be carefully reduced and closure performed using the surgeon’s preferred technique.
Stem extraction

In the unlikely event that the stem needs to be removed, the extraction rod is screwed into the threaded hole on the lateral/proximal shoulder of the stem. The slotted mallet is then used to gently strike the underside of the extraction rod handle, using the cut-out feature of the mallet to guide and control the blows.
Ordering information

**TriFit™ standard tapered stem**
- 694.0001 Size 1 Cementless
- 694.0002 Size 2 Cementless
- 694.0003 Size 3 Cementless
- 694.0004 Size 4 Cementless
- 694.0005 Size 5 Cementless
- 694.0006 Size 6 Cementless
- 694.0007 Size 7 Cementless
- 694.0008 Size 8 Cementless
- 694.0009 Size 9 Cementless
- 694.0010 Size 10 Cementless
- 694.0011 Size 11 Cementless

**TriFit™ lateralised tapered stem**
- 694.1001 Size 1 Cementless
- 694.1002 Size 2 Cementless
- 694.1003 Size 3 Cementless
- 694.1004 Size 4 Cementless
- 694.1005 Size 5 Cementless
- 694.1006 Size 6 Cementless
- 694.1007 Size 7 Cementless
- 694.1008 Size 8 Cementless
- 694.1009 Size 9 Cementless
- 694.1010 Size 10 Cementless
- 694.1011 Size 11 Cementless

**CoCr modular heads (12/14)**
from the *Trinity™* acetabular system

- E321.028 Short -3.5mm 28mm
- E321.032 Short -4.0mm 32mm
- E321.036 Short -4.0mm 36mm
- E321.040 Short -4.0mm 40mm
- E321.128 Medium 0.0mm 28mm
- E321.132 Medium 0.0mm 32mm
- E322.136 Medium 0.0mm 36mm
- E321.140 Medium 0.0mm 40mm
- E321.228 Long +3.5mm 28mm
- E321.232 Long +4.0mm 32mm
- E321.236 Long +4.0mm 36mm
- E321.240 Long +4.0mm 40mm
- E321.332 Extra long* +7.0mm 32mm
- E321.336 Extra long* +8.0mm 36mm
- E321.340 Extra long* +8.0mm 40mm

**BIOLOX® delta ceramic modular heads (12/14)**
from the *Trinity™* acetabular system

- 104.2800 Short -3.5mm 28mm
- 104.3200 Short -4.0mm 32mm
- 104.3600 Short -4.0mm 36mm
- 104.4000 Short -4.0mm 40mm
- 104.2805 Medium 0.0mm 28mm
- 104.3205 Medium 0.0mm 32mm
- 104.3605 Medium 0.0mm 36mm
- 104.4005 Medium 0.0mm 40mm
- 104.2810 Long +3.5mm 28mm
- 104.3210 Long +4.0mm 32mm
- 104.3610 Long +4.0mm 36mm
- 104.4010 Long +4.0mm 40mm
- 104.3215 Extra long* +7.0mm 32mm
- 104.3615 Extra long* +8.0mm 36mm
- 104.4015 Extra long* +8.0mm 40mm

**Indications**
- Non-inflammatory degenerative joint disease including osteoarthritis and avascular necrosis
- Rheumatoid arthritis
- Correction of functional deformity
- Treatment of non-union, femoral neck and trochanteric fractures of the proximal femur
- Developmental Dysplasia of the Hip (DDH) and Congenital Dysplasia of the Hip (CDH)

**Contraindications**
- Infection
- Osteomyelitis
- Sepsis
- Osteomalacia
- Distant foci of infections
- Osteoporosis
- Marked bone loss or bone resorption
- Metabolic disorders which may impair bone formation
- Vascular insufficiency
- Muscular atrophy or neuromuscular disease
- Allergy to implant material
- Severe deformity

*Not for use in the USA*
### Sizing guide

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