

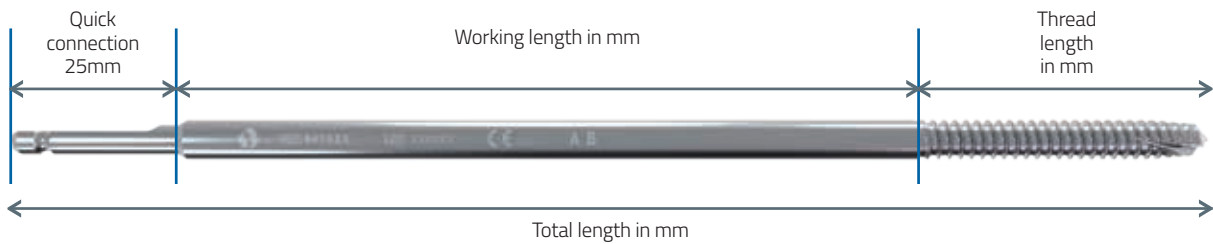


# THE XCALIBER™ CYLINDRICAL BONE SCREW

INSERTION TECHNIQUE

## XCALIBER™ CYLINDRICAL BONE SCREWS

XCaliber™ Cylindrical Bone Screws are self-drilling and self-tapping, suitable for use in both cancellous and cortical bone. They are supplied in five different lengths (100mm, 120mm, 150mm, 180mm and 260mm) with Quick Connection. They are cut to the appropriate length after insertion. Screws are supplied in four thread diameters (6mm, 5mm, 4mm and 3mm) and different thread lengths as shown in the table below. All screws are available uncoated in stainless steel.



### SHAFT DIAMETER 6mm, THREAD DIAMETER 6mm

| Total length (mm) | Thread length (mm) |           |           |           |           |           |           |           |    |    |
|-------------------|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----|----|
|                   | 25                 | 30        | 35        | 40        | 45        | 50        | 60        | 70        | 80 | 90 |
| 180 QC            | 99-941625          | 99-941630 | 99-941635 | 99-941640 | 99-941645 | 99-941650 | 99-941660 | 99-941670 | *  | *  |
| 260 QC            | 99-942625          | 99-942630 | 99-942635 | 99-942640 | 99-942645 | 99-942650 | 99-942660 | 99-942670 | *  | *  |

### SHAFT DIAMETER 6mm, THREAD DIAMETER 5mm

| Total length (mm) | Thread length (mm) |           |           |           |           |           |           |           |    |    |
|-------------------|--------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----|----|
|                   | 25                 | 30        | 35        | 40        | 45        | 50        | 60        | 70        | 80 | 90 |
| 150 QC            | -                  | -         | -         | 99-944540 | -         | -         | -         | -         | -  | -  |
| 180 QC            | 99-941525          | 99-941530 | 99-941535 | 99-941540 | 99-941545 | 99-941550 | 99-941560 | 99-941570 | -  | -  |
| 260 QC            | 99-942525          | 99-942530 | 99-942535 | 99-942540 | 99-942545 | 99-942550 | 99-942560 | 99-942570 | *  | *  |

### SHAFT DIAMETER 6mm, THREAD DIAMETER 4mm

| Total length (mm) | Thread length (mm) |           |           |           |           |
|-------------------|--------------------|-----------|-----------|-----------|-----------|
|                   | 25                 | 25        | 30        | 35        | 40        |
| 100 QC            | 99-943420          | -         | 99-943430 | -         | 99-943440 |
| 120 QC            | 99-944420          | -         | 99-944430 | -         | 99-944440 |
| 150 QC            | 99-945420          | 99-945425 | 99-945430 | 99-945435 | 99-945440 |
| 180 QC            | 99-946420          | -         | 99-946430 | -         | 99-946440 |

| SHAFT DIAMETER 4mm, THREAD DIAMETER 3mm |                    |           |           |           |           |
|---|--------------------|-----------|-----------|-----------|-----------|
|   | Thread length (mm) |           |           |           |           |
| Total length (mm)                       | 15                 | 20        | 25        | 30        | 35        |
| 100 QC                                  | -                  | 99-947320 | 99-947325 | -         | -         |
| 120 QC                                  | 99-948315          | 99-948320 | 99-948325 | 99-948330 | 99-948335 |



**NOTE:** All screws are also available packaged non sterile. They can be ordered using the above code numbers without 99- [e.g. 942560]  
\* Upon request.

## INSTRUMENTS

| CODE  | Description         |
|-------|---------------------|
| 91150 | Universal T Wrench  |
| 93161 | Screw Hand Drill QC |
| 93162 | Screw T Wrench QC   |

*Standard Instrumentation for Screw Insertion*

|         |   |
|---------|---|
| STERILE | R |
|---------|---|



**PRECAUTIONS:** Contents sterile unless package opened or damaged; Do not use if package is opened or damaged.

The cylindrical thread has been designed to optimize insertion time and perforation of the second cortex. These screws can be backed out if not properly inserted, without loosening the bone-screw interface.



Fig. 1

The screws all have a pointed tip and flute which allow them to be inserted self-drilling by using a power drill or a hand drill.

When insertion of self-drilling screws is performed in diaphyseal bone, pre-drilling might be recommended; use a drill bit through a drill guide (4.8mm drill bit for 6mm thread diameter screws, 3.2mm drill bit for 5mm thread diameter screws, 3.2mm drill bit for 4mm thread diameter screws, 2.7mm drill bit for 3mm thread diameter screws).

XCaliber™ Cylindrical bone screws of 6mm thread diameter can be used in any situation where the diameter of the bone at the point of insertion is greater than 20mm. If it is less than 20mm, 5mm, 4mm or 3mm thread diameter screws should be used according to bone diameter. Care should be taken that the screw is inserted in the center of the bone axis. If it is too peripheral the bone may be weakened.

#### XCaliber™ Cylindrical Screw Insertion

The following operative steps are related to 6mm and 5mm thread bone screws. The same operative steps can be followed also for 4mm and 3mm thread bone screws insertion.

Make a 15-20mm incision so that the skin around each screw is not too tight. The underlying tissues also require broad blunt dissection down to the bone.

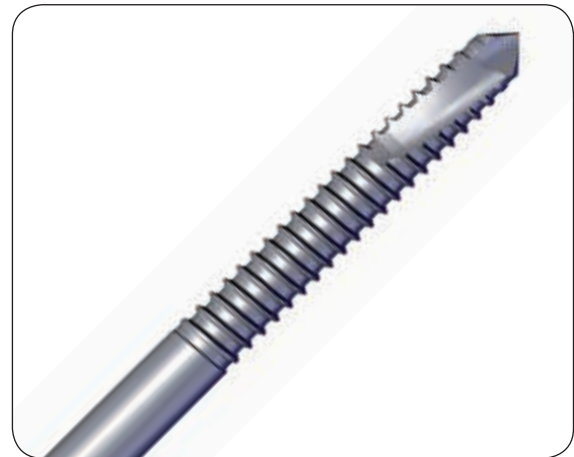


Fig. 2

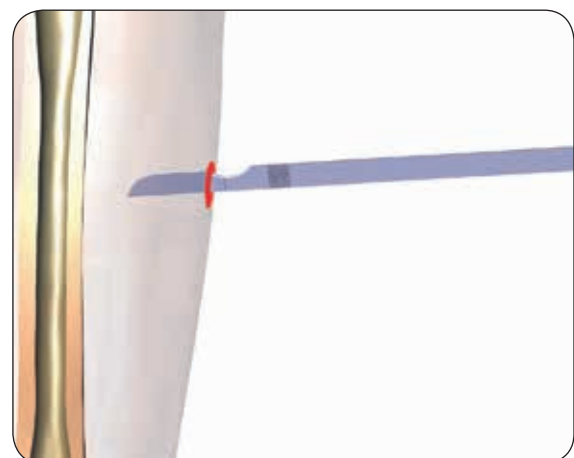


Fig. 3

Insert a screw guide perpendicular to the longitudinal axis of the bone. Use a trocar to locate the midline by palpation. Keep the screw guide in contact with the cortex by gentle pressure, withdraw the trocar, and tap the screw guide lightly to anchor its distal end.



Fig. 4

Insert a screw through the screw guide into the bone directly using the power drill. While drilling, the power drill should be held steady so that the drilling direction is maintained throughout the procedure. Once the second cortex has been reached, reduce the drilling speed.

Alternatively a screw might be inserted manually with the hand drill QC or the T-wrench QC.

In diaphyseal bone, the screw should protrude 2mm beyond the distal cortex. In cancellous bone, there is no need for the screw to protrude from the second cortex.

In all cases the surgeon should be mindful of the amount of torque required to insert the screw. In general, it is advisable to pre-drill the diaphyseal bone using a drill bit (4.8mm drill bit for 6mm thread diameter screws, 3.2mm drill bit for 5mm thread diameter screws).

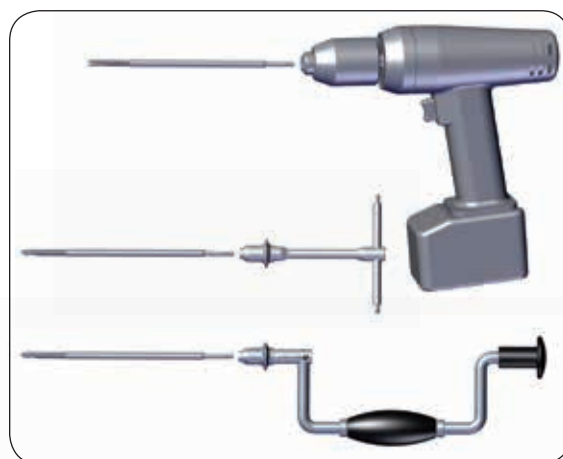


Fig. 5

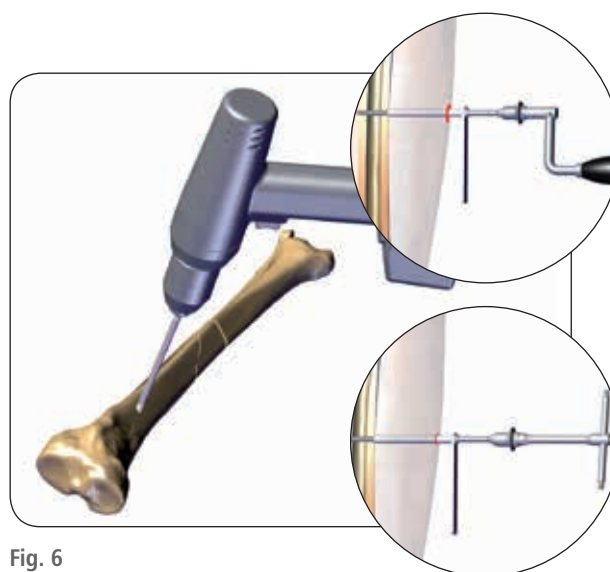


Fig. 6

**When Inserted After Pre-Drilling**

Insert the 3.2mm or 4.8mm drill guide into the screw guide, and introduce a 3.2mm or 4.8mm drill bit. Drill at 500-600 rpm through the first cortex, checking that the drill bit is at right angles to the bone. The force applied to the drill should be firm and the drilling time as short as possible to avoid thermal damage. Ensure that the drill bit completely penetrates the second cortex.

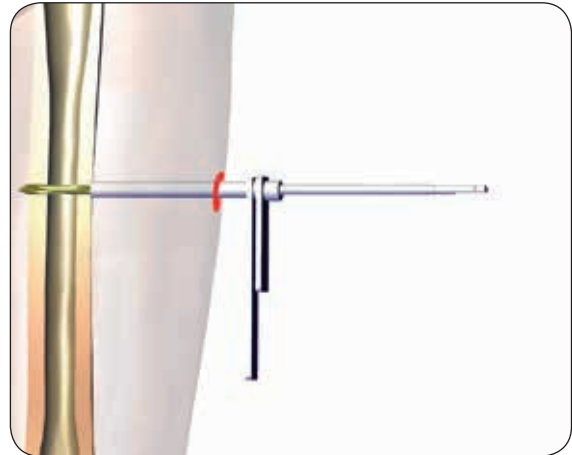


Fig. 7

Remove the drill bit and drill guide, keeping pressure on the handle of the screw guide. The screw is inserted with the T-Wrench QC or hand drill QC until it reaches the second cortex. Ensure that about 2mm of the screw protrudes beyond the second cortex.

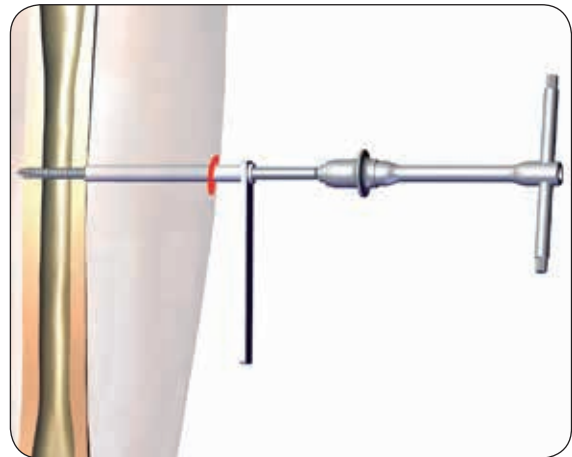


Fig. 8

**CUTTING THE BONE SCREW SHAFTS TO LENGTH**

When all screws have been inserted and the screw guides removed the fixator is applied. After the fixator clamps have been securely locked over the screws, the screw shafts can be cut with the bone screw cutter. It is important that all of the screws are inserted first, and the fixator applied with the clamps tightened firmly over the screws, about 20mm from the skin. The cutter can then be slid over the screw shafts in turn and the screws cut close to the fixator clamps. This will normally result in about 6mm of screw shaft protruding from the fixator. The cut ends of the screws can then be protected with screw caps. When cutting the screws, the arms of the cutter should be extended for greater efficiency, and the outer end of the screw held to prevent it causing injury. For bone screws removal the T-wrench QC has to be used. Alternatively, if the screws have been cut, the Universal T wrench is necessary.

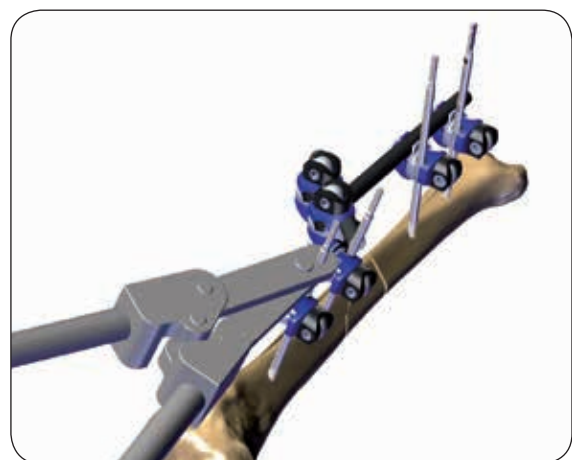


Fig. 9

The technique shown is for illustrative purposes only. The technique(s) actually employed in each case will always depend upon the medical judgment of the surgeon exercised before and during surgery as to the best mode of treatment for each patient. Please see the Instructions for Use for the complete list of indications, warnings, precautions, and other important medical information.

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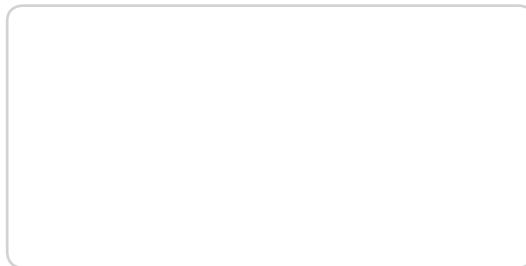
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