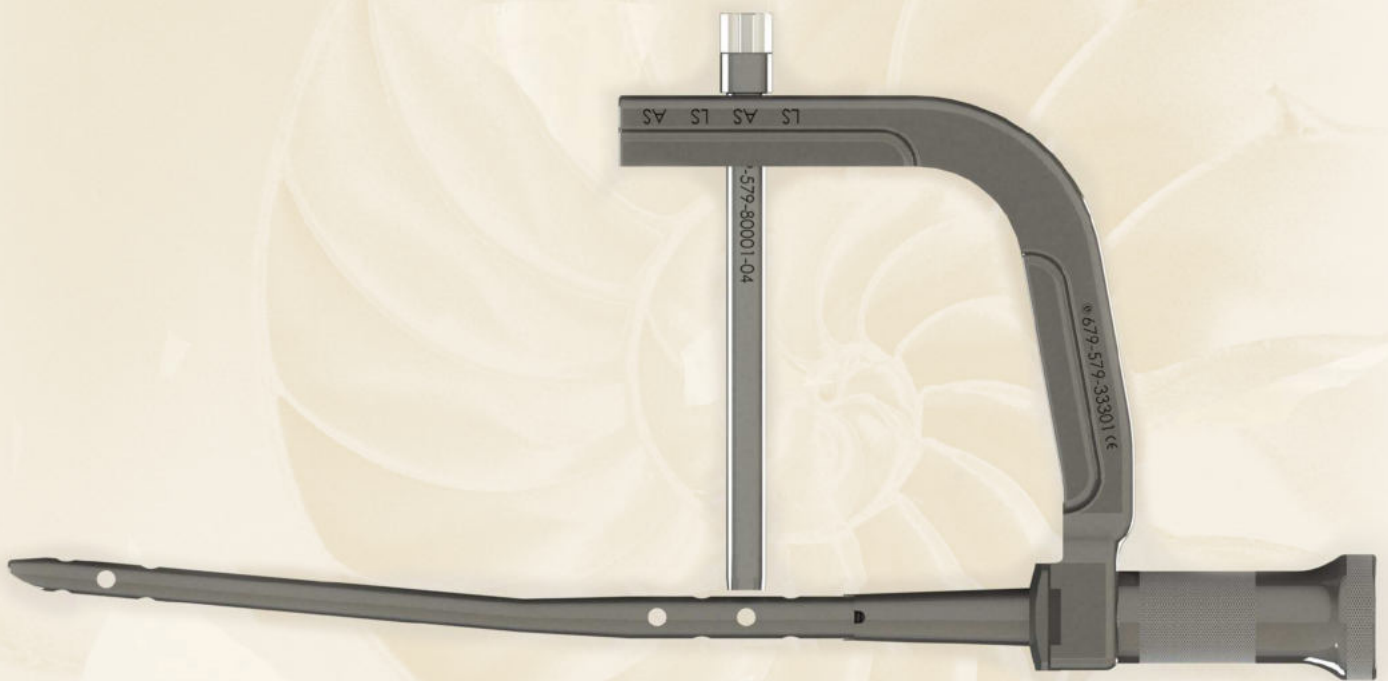


Biotech Humeral Nail

Surgical Technique



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"Movement is Life"

PROXIMAL TARGETING

Assembling of the nail and the targeting device

- On the basis of the pre-operative measurements, the humeral nail of the right length and thickness is chosen.



- In the first step, fit the Driver Bushing onto the nail, and then fix them together with the help of the Driver Bolt.



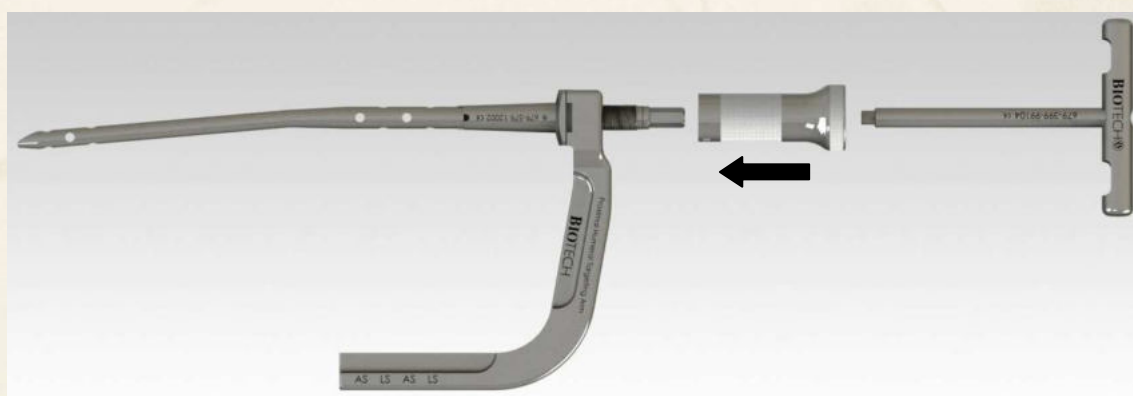
- Tighten the Driver Bolt using Wrench no.8 (with cardan joint).



- After that, place the Proximal Humerus Targeting Arm onto the Driver Bushing.



- After that, turn on the Nail Impactor on the Proximal Humerus Targeting Arm and tighten used T wrench (699-399-99104).





- Turn on the Driver Handle to the Nail Impactor

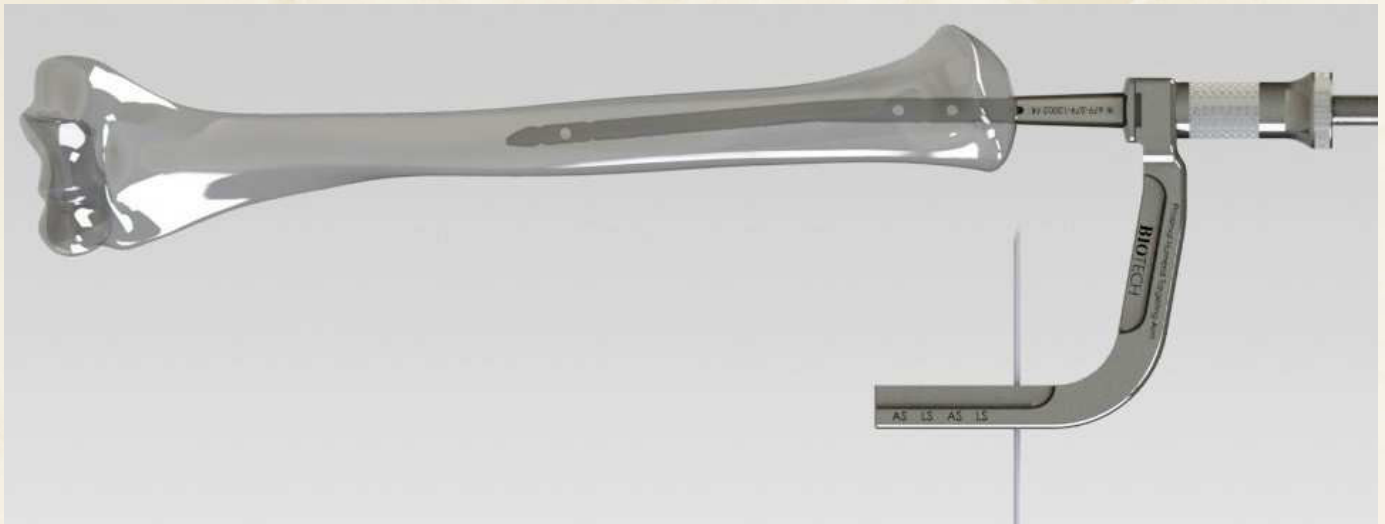


The Proximal Targeting Arm can be rotated together with the base arm by 90 degrees. For this, the Nail Impactor has to be loosened. This rotation can prove useful for targeting the locking hole present on the anterior plane.

If the armed use by the anterior, the marked holes using "AS", and if the lateral in, the "LS" signal holes.

Insertion of the intramedullary nail

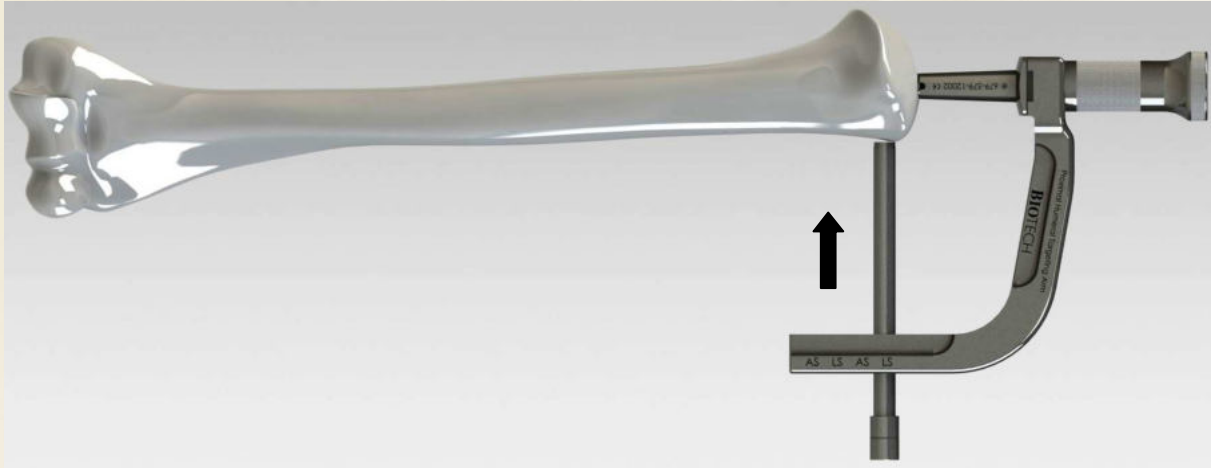
- A little incision is made in the skin of the shoulder, laterally, between the acromion tip and the tuberculum maius, in a direction that the surgeon finds suitable. Advance bluntly towards the head of the humerus, then a little bit proximally to the tuberculum maius open the intramedullary canal using a sharp awl.
- Prior to the insertion, it is advisable to check how the thickness of the selected nail compares to the size of the intramedullary canal. Based on that it can be decided whether to carry out the intramedullary reaming or not. After that carefully, while holding the nail near the targeting arm, introduce it into the canal by continuously rotating it few degrees around its long axis. If necessary, apply mild strokes with the hammer on the driver handel. The proper positioning of the nail can be checked with the help of an X-ray monitor.
- Note On the target arm through a hole in $d = 2.5$ mm Kirschner wire introduced, to determine the end of the nail in the bone on the X-ray monitor.



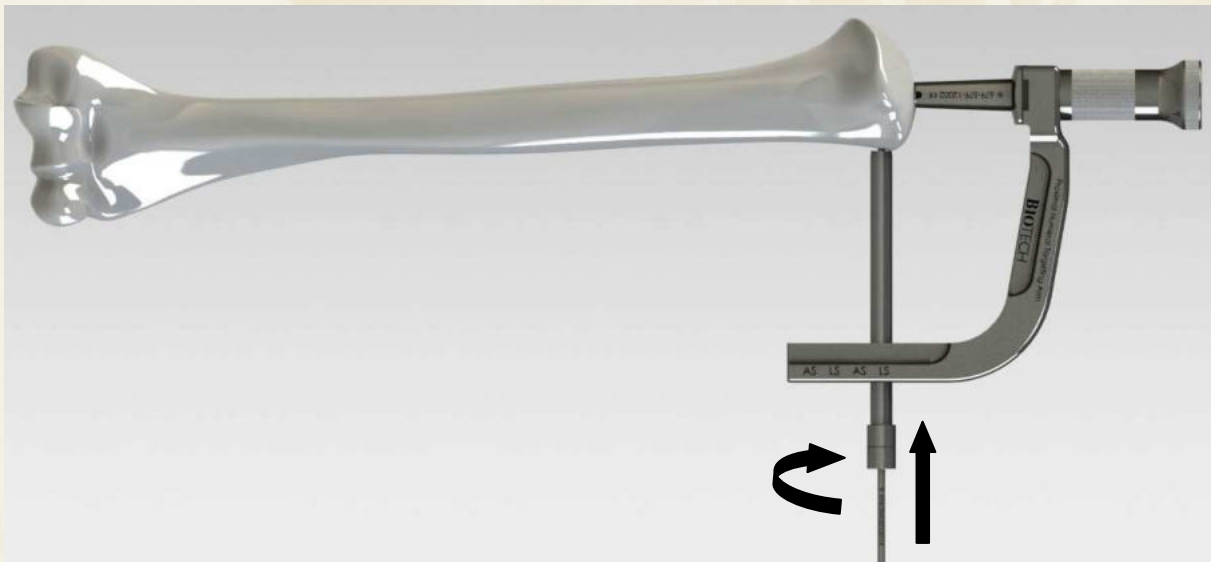
Insertion of the locking bone screws

In the case of humeral nail, the locking bone screws are uniformly 4mm in diameter.

First, slide the drill bushing into the guide tube, and then push it through the selected hole on the proximal targeting arm, and continue all the way through a little skin incision until reaching the humeral cortex.



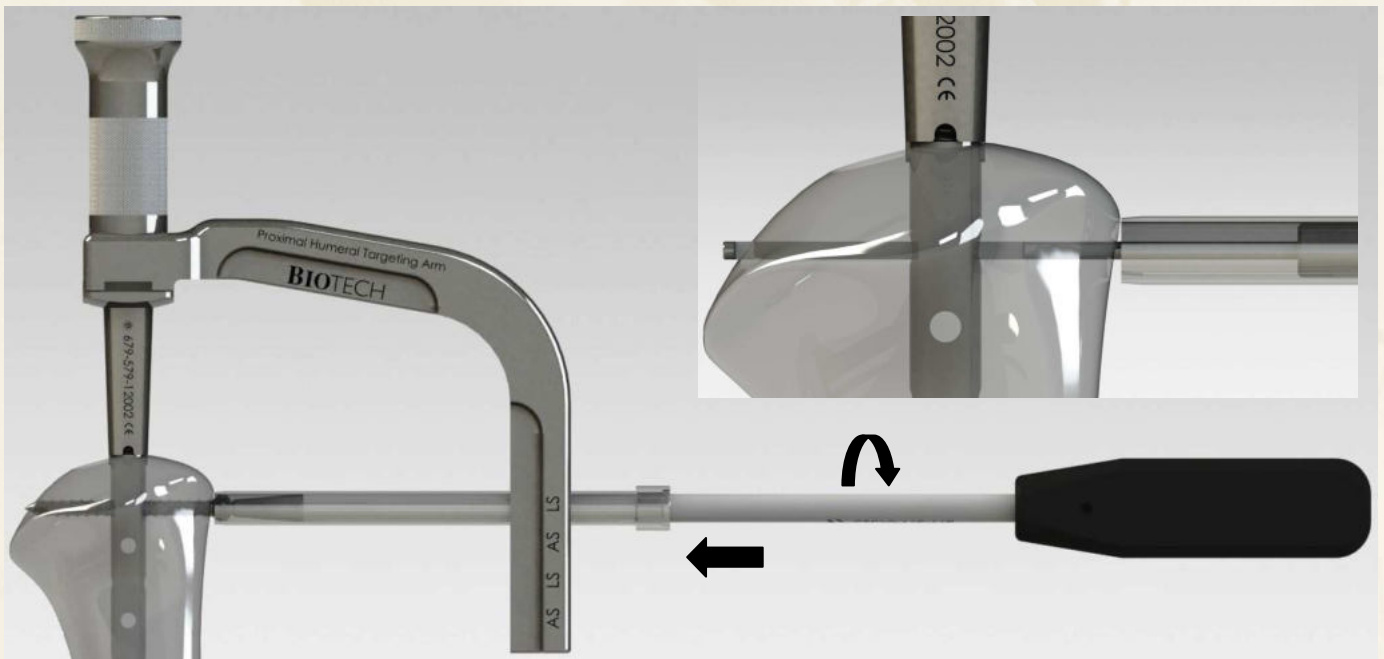
- Next, drill the humeral cortex using a $\varnothing 3,2\text{mm}$ drill.



- After that, remove the drill bushing, measuring the screw length,



and introduce the locking bone screw through the guide tube, and tighten with 2,5 hexa screwdriver



- On the proximal side, the anterior plane interlocking holes can be used, by rotating the proximal targeting arm 90 degrees in the ventral direction. For use the "AS" sign holes on the Arm.



Distal Targeting

The distal targeting proceed with free hand technik with help of an X ray monitor.

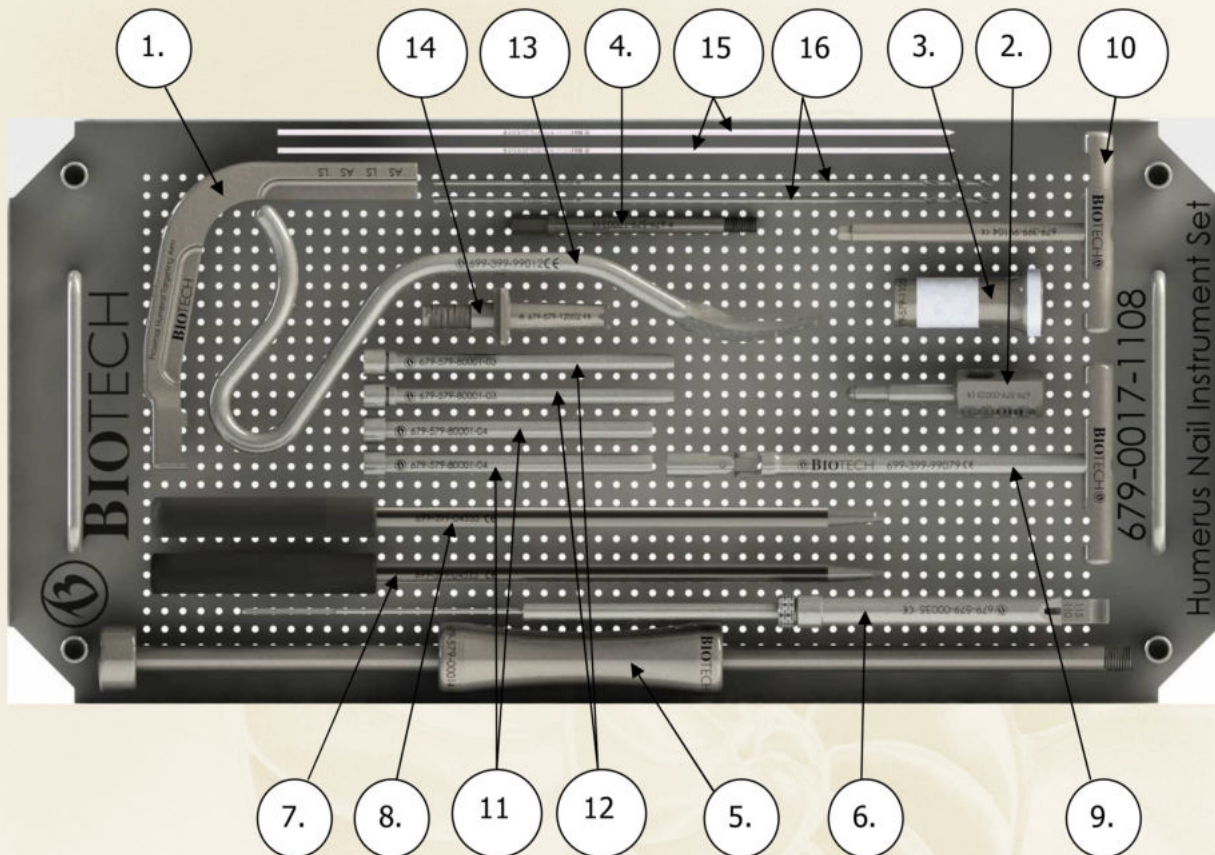
After inserting the proximal locking screws there could be the posibility to create some intrafragmental compression if necessary by applying mild backward strokes to the elbow.

As proximally the option is available distally for introducing locking screws either ont he anterior plane, or lateral plane.

Techniques for the removal of the intramedullary nails

- For the removal of previously inserted intramedullary nail, first open up the head of the nail, and then remove the nail closing plug and all of the locking bone screws.
- Place the driver bushing in position, fix it with the driver bolt, and then fit the driver handle to it.
- Connect the extractor adapter to the driver handle.
- The nail hammer extractor -with the help of its threads - can be screwed into the extractor adapter. To prevent damaging of the threads, the connection should be tightly secured between the adapter and the hammer extractor's rod.
- Finally, by moving the hammer extractor the nail can be pulled out.





Biotech Code	Description	Pcs./set
1. 679-579-33301	Humeral Targeting Arm.....	1 pc.
2. 679-579-00023	Extractor Adaptor.....	1 pc.
3. 679-579-11005	Nail Impactor	1 pc.
4. 679-579-12003	Driver Bolt	1 pc.
5. 679-579-00014	Hammer Extractor.....	1 pc.
6. 679-579-00035	Screw Depth Gauge.....	1 pc.
7. 699-399-04525	Screwdriver Hexa 2,5.....	1 pc.
8. 699-399-04535	Screwdriver Hexa 3,5.....	1 pc.
9. 699-399-99079	T Wrench In Hexa 8mm With Cardan	1 pc.
10. 699-399-99104	T Wrench Out Hexa 6mm.....	1 pc.
11. 679-579-80001-03	Humerus Drill Bushing 3,5	2 pcs.
12. 679-579-80001-04	Humerus Guide Tube 9,5	2 pcs.
13. 679-579-12002	Driver Bushing.....	1 pc.
14. 699-399-99012	Awl.....	1 pc.
15. 975-375-25320	Kirschner Wire Ø2,5-320 mm	2 pcs.
16. 694-394-32250	Drill Ø 3,2-250 mm.....	2 pcs.



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