SURGICAL TECHNIQUE LOCKING HUMERAL NAIL – DISTAL AIMING

Instructions for use: - IFU 3134.

COMPLETION OF THE SURGICAL TECHNIQUE - LOCKING HUMERAL NAIL



THE AIMING DEVICE CROSSBEAMS ARE MADE OF THE TRANSPARENT MATERIAL TO X-RAYS. STERILIZATION CAN BE PERFORMED ONLY BY USING THE STEAM OF THE TEMPERATUTE OF 134°C! THE PERMANENT DEFORMATION AND THE LOSS OF THE CROSSBEAM FUNCTIONALITY CAN HAPPEN WHEN USING THE HIGHER TEMPERATURE!



IT IS NECESSARY TO TAKE INTO ACCOUNT POSSIBLE DEVIATION OF THE AIMING AT THE DISTAL AIMING. THE CHECK UNDER X-RAY AMPLIFIER IS THEREFORE ESSENTIAL. IT IS NOT ALLOWED TO USE AN EXCESSIVE FORCE TO THE AIMING DEVICE.



IT IS NECESSARY BEFORE DRILLING TO USE THE AWL TO CREATE AN EN-TRY POINT FOR THE DRILL TO PROTECT SLIDING OF THE DRILL ON THE BONE DURING DRILLING.



THE AWL IS SHARP!



Intended purpose for use

The aiming device is used for locking of the holes of the distal humeral locking nails.



Surgical technique

Distal locking of the holes in the nail with screws follows after locking of the nail in its proximal portion, see Surgical technique: Locking humeral nail

The humeral distal aiming device is put onto the humeral proximal aiming device. It is essential to test the functionality of the aiming device before the introduction of the nail into the bone. See chapter Aiming device completion before surgery.

The surgeon sets the position of the patient's arm and the assistant keeps it in that position throughout the locking of the distal holes.

1. Aiming device completion before surgery

The distal aiming device assembly which is oriented according to the needs to the right or left arm is a first step. The screw marked by green (Fig. 1) is intended for the arm tightening. The screw is possible to tighten by hand or possibly by the tightening rod.



The length of the aiming device assembly is done by the length of the nail used for the surgery - the aiming device will be locked for the nail length of 250 mm with the screw of the same value. The distal aiming device arm is attached to the basic body (Fig.2).





CHECK THE CORRECT FUNCTION OF THE AIMING DEVICE AFTER ITS ASSEMBLY.

Fit the sleeves into the aiming device and check all holes in the nail. It is appropriate to use the sleeve of \emptyset 10/8 and trocar of \emptyset 8 (Fig. 3).



2. The aiming device placement

The distal aiming can be used after the proximal locking of the nail. Remove the proximal arms from the proximal aiming device (Fig. 4) and attach to this place the distal aiming according to the required nail length (Fig. 5).





3. Hole for the drill

Insert the sleeve of Ø 10/8 into the aiming device; push it to the skin to be able to create incision. After insert trocar of Ø 8 into the sleeve and push to the bone. Remove trocar; insert the awl and using rotational movements create an entry point for the drill in corticalis (Fig. 6) to protect sliding of the drill on the bone during drilling. Remove the awl after this step. This procedure is recommended for all distal holes in the nail.

4. The distal aiming offers several possibilities of locking

4.1 Locking when using two drills

It is recommended to lock the ventrodorsal hole first for more precise aiming and the steady construction achievement. Insert the sleeve of Ø 10/8 into the aiming device. Press to the skin to be able to perform incision. Insert trocar of Ø 8 into the sleeve and push to the bone. After proceed according to the chapter 3. Subsequently insert the sleeve of Ø 8/3.2, drill through it the hole into the bone using the drill of Ø 3,1 (Fig. 7). The drill is provided with a scale for monitoring of the necessary screw length.

Unfasten the drill from the drilling machine and leave it with the sleeve introduced in the bone!







THE CHECK UNDER X-RAY AMPLIFIER IS ESSENTIAL AT THIS STEP.

It is possible to secure other nail holes when aiming device stability achieved. It is recommended to secure the hole next to the sleeves with the drill, which increases the aiming device stability (Fig. 8).



The lateromedial holes can be locked the same way after the hole locking from the ventrodorsal side (Fig. 9).



IT IS NECESSARY TO VERIFY THE SITE OF RADIAL OR AXILLARY NER-VES BY PREPARATION, IF THEY CAN BE INJURED WHEN INTRODUCING ANY SCREW. THE FOLLOWING LOCKING BY SCREW AT THIS PLACE IS NECESSARY TO PERFORM UNDER VISUAL CHECK.





4.2 Locking using the fix pin

It is recommended to lock the ventrodorsal hole first for the more precise aiming and the steady construction achievement. Insert the sleeve of Ø 10/8 into the hole for FIX PIN. Insert trocar of Ø 8 into the sleeve and push to the bone. Remove trocar, insert the awl and using rotational movements create an entry point for the drill in corticalis (Fig. 10) to protect sliding of the drill on the bone during drilling. After, remove the awl and using the sleeve of Ø 8/3.2 and the drill of Ø 3,1 carefully drill through the adjacent corticalis till you reach the nail (Fig. 11).



TAKE CARE OF THE RADIAL NERVE COURSE WHEN USING THE PIN FROM THE LATEROMEDIAL SIDE.





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Remove the sleeves with the drill and insert the fix pin into the FIX PIN hole and secure with the pin holder. The pin has to touch the nail surface. If the pin does not touch it, push the distal aiming closer to the nail to limit the distance (Fig. 12).



Insert the sleeve of \emptyset 10/8 into the aiming device from the ventrodorsal side. Press to the skin to be able to perform incision. Insert trocar of \emptyset 8 into the sleeve and push to the bone. After proceed according to the chapter 3.

Proceed the same way to lock the lateromedial holes after the ventrodorsal holes are locked (Fig. 13a, 13b). (Fig. 14a,14b)



POKUD PŘI ZAVÁDĚNÍ KTERÉHOKOLIV ŠROUBU HROZÍ PORANĚNÍ N. RADIALIS NEBO N. ULNARIS, JE NUTNÉ JEJICH ULOŽENÍ OVĚŘIT PRE-PARACÍ. NÁSLEDNÉ ZAJIŠTĚNÍ ŠROUBEM V TOMTO MÍSTĚ JE NUTNÉ PROVÁDĚT POD KONTROLOU ZRAKU.









4.3 Locking using calibration

Locking using calibration of the aiming device is possible only for the ventrodorsal holes. Insert the drill of Ø 3,1 into the calibration groove and drill into the bone. After, tighten the screw. Perform an X-ray check of the drill position towards the holes in the nail. (Fig. 15a, 15b). If the drill is outside of the hole centre, loosen the calibration screw and slightly move the aiming device to the required side (Fig. 16). After, tighten the screw again and perform the X-ray check. Calibration is set to the indicative value of 2 mm. Perform the locking of the most distal hole according to chapter 4.1 (Fig. 18a, 18b) after the ideal overlap of the drill with the aiming device holes (Fig. 17).









Fig. 18b

LOCKING HUMERAL NAIL – DISTAL AIMING

IINSTRUMENTATION SET FOR LOCKING HUMERAL NAIL



397 139 09 1020

1

2

3

4

		pcs
397 129 68 0710	Distal aiming device for humeral nail	1
397 129 68 0820	Trocar Ø8 × 176 mm	1
397 129 68 0800	Fixation pin Ø 3 $ imes$ 120 mm	1
397 129 69 0810	Pin holder	1

Set of instruments for LHN – distal part



397 129 68 1000 Sieve for instrumentation for LHN - distal part 400 × 240 × 50 mm *excluding instruments*



397 139 09 1025 Instrumentation set of LHN - distal part 400 × 240 × 50 mm including instruments

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