

STRAIGHT NARROW PLATE 4.5/5 MM

SURGICAL TECHNIQUE

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1. Description of Surgical Technique

NAME: Straight Narrow Plate 4.5/5mm

DESCRIPTION: Straight narrow plate is part of plate and screw system that merges locking internal compression technique with conventional plating techniques. Straight narrow plate has combination of locking and compression hole. The combination hole allows placement of standard cortex screws on one side and threaded conical locking screws.

Available in SS 316L and Titanium Grade 5 materials.

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2. Feature & Benefits



Plates:

- Threaded hole section for locking screws
- Dynamic Hole section for cortical screws
- Uniform Hole spacing
- Load (Compression) & neutral screw position
- Holes in straight plates are oriented so that the compression component of hole is always directed towards the middle of plate.
- Limited contact plate design reduces plate to bone contact.
- Early mobilization

Locking Screws:

- Conical Head facilitates alignment of locking screws in threaded plate hole to provide secure plate screw construct.
- The larger core diameter improves bending and shears strength and distributes the load over a larger area of bone.
- The shallow thread profile of locking screws results from the larger core diameter, but it acceptable because locking screw does not rely solely on screw threads to create compression between plate & screw to maintain stability.

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3. AO Principle

In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation:

1. Anatomic reduction: Fracture Reduction and fixation to restore anatomical relationships.
2. Stable fixation: Fracture fixation providing absolute or relative stability, as required by the patient, the injury, and the personality of the fracture.
3. Preservation of blood supply: Preservation of the blood supply to soft tissues and bone by gentle reduction techniques and careful handling.
4. Early, active mobilization: Early and Safe Mobilization and rehabilitation of the injured part and the patient as a whole.

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4. Indications

Indicated for Humerus, Femur and Tibia fractures.

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5. Intended Purpose

Straight Narrow Plate 4.5/5mm is intended for fixation of various long bones, such as the humerus, femur and tibia. These are also used in fixation of peri-prosthetic fractures, osteopenic bone and fixation of non-unions and mal-unions in adult patients.

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6. Contraindications

- Since external fixation devices are often used in emergency situations to treat patients with acute injuries, there are no absolute contraindications for use. The surgeon's education, training and professional judgment must be relied upon to choose the most appropriate device and treatment for each individual patient. Whenever possible, the device chosen should be of a type indicated for the fracture being treated and/or for the procedure being utilized.
- Insufficient quantity or quality of bone which would inhibit appropriate fixation of the device.
- Compromised vascularity that would inhibit adequate blood supply to the fracture or operative site.
- Previous history of infections.
- Any neuromuscular deficit which could interfere with the patient's ability to limit weight bearing.
- Any neuromuscular deficit which places an unusually heavy load on the device during the healing period.
- Malignancy in the fracture area.
- Mental, physical or neurological conditions which may impair the patient's
- Ability to cooperate with the post-operative regimen.
- Patients with a compromised immune system.
- Pre-existing internal fixation that prohibits proper pin placement

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7. Surgical Steps

Patient Position: Position the patient supine on a radiolucent operating table. Visualization of the bone fluoroscopy in both the lateral and AP views is recommended.

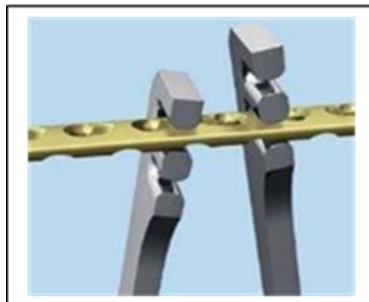
Plate Selection: Use bending template to determine plate length & bending profile.

Instrument: Bending template

Contouring: Use bending instrument to contour the locking compression plate to the anatomy. The plate holes have been designed to accept some degree of deformation. When bending the plate, place the bending iron on two consecutive holes. This ensures that threaded holes will not be distorted. Significant distortion of the locking holes will reduce locking effectiveness.

Instrument:

Plate bender small (pair)



Position plate and insertion of plate:

The plate may be temporary held in place with standard bone holding forceps. The middle of the plate should be positioned over fracture side if compression of fracture fragments is desired.

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Instrument:

Ø1.5mm guide wire

2.8mm drill sleeve for 2.8mm drill

Locking screw insertion

Determine the combination of screws to be used for fixation. If a combination of locking and cortex screws is used, cortex screws should be inserted first to pull the plate to the bone. If a locking screw is used as the first screw, be sure the fracture is reduced and the plate is held securely to the bone.

Use 2.8mm Drill Sleeve for inserting locking screw. After finding the screw position, 2.8mm Drill Sleeve attached in locking threaded hole of the plate Ø2.8mm Drill bit is passed through this Lift drill sleeve. Depth of drill is measured by using depth gauge or also it may direct measure by the size marking on drill. Screw is placed in appropriate locking hole of plate with required size by using self-holding or simple screw driver. Torque limiting screw driver is also used to tighten the Lift locking Screws.



Instrument:

hex screw driver 5mm

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Ø4.5 mm torque limiting screw driver

Ø 4.3mm drill bit

Ø 4.3mm drill sleeve

Placement of Cortex Screws:



Use 3.2/4.5mm Universal drill Guide for inserting 4.5mm cortical screw in shaft of the plat. Cortex screw is placed in combi hole for achieve dynamic compression. First, 3.2/4.5mm Universal drill guide is located in the dynamic portion of the shaft hole. 4.3mm Drill bit is used to drill the cortices passing through drill guide. With the use of depth gauge, require size of 4.5mm cortical screw is measured 4.5mm bone Tap is prefer for reaming the drill and then cortex Screw is inserted with the help of screw driver.

- Ø 4.3 mm drill bit
- Ø 4.5mm bone tap
- depth gauge 5mm with scale

Check Position of Screw tip:

Check the screw lengths under image intensifier control in the full range of glens-humeral-motion and ensure that they do not penetrate the articular surface. It is important to check the screw lengths in all planes as their angulations and direction may be difficult to visualize.



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8. Implant Removal

Unlock all screws from the plate, and then remove the screws completely from the bone. This prevents simultaneous rotation of the plate when unlocking the last lock screw. If a screw cannot be removed with the screwdriver, use the T-Handle with Quick Coupling to insert the Extraction Screw into the screw head, and unscrew the screw in a counter clock direction.

Instruments:

Ø3.5mm hollow mill for screw removal

Ø3.5mm broken screw removal forceps

Ø3.5mm screw driver quick coupling x 5"

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9. Caution

Used Implants: Used implants which appear un-damaged may have internal and/or external defects. It is possible that individual stress analysis of each part fails to reveal the accumulated stress on the metals as a result of use within the body. This may lead ultimately to implant failure after certain point of time due to metal fatigue. Therefore, reuse of implants is strictly not recommended.

SINGLE BRAND USAGE: Implant components from one manufacture should not be used with those of another. Implants from each manufacture may have metal, dimensions and design differences so that the use in conjunction with different brands of devices may lead to inadequate fixation or adverse performances of the devices.

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10. Disposal of Implants

Every used or removed implant must be discarded after use and must never be re- used. It should be bent or scratched & then disposed of properly so that it becomes unfit for reuse. While disposing it off, it should be ensured that the discarded implant does not pose any threat to children, stray animals and environment. Dispose of the implants as per applicable medical practices and local, state and country specific regulatory requirement of Bio Medical Waste rules.

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11. Packaging Material Disposal

The packaging material of this device is made special packing material and therefore if swallowed, may cause choking Hazards. Therefore, it should be disposed of in such a way that keeps out of reach of children and stray animals.

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12. MRI Information

IMPORTANT:

- Yogeshwar Implants (I) Pvt. Ltd. implants are manufactured from SS 316L and Titanium Grade 5 material both are non-magnetic material, hence it do not pose any safety risk.
- Patients should be directed to seek a medical opinion before entering potentially adverse environments that could affect the performance of the implants, such as electromagnetic or magnetic field or including a magnetic resonance environment.
- Doctor shall conduct a Risk Benefit Analysis before directing the patient to enter electromagnetic or magnetic fields or including a magnetic resonance environment.
- The Yogeshwar Implants (I) Pvt. Ltd. implants has not been evaluated for safety and compatibility in the MR environment but on the basis of literature study below mentioned points can be taken care during MRI
- The minimum recommended time after the implantation that allows patients to safely undergo MRI examination or allowing the patient or an individual to enter the MRI environment is 6 (six) weeks.
- The maximum recommended time limit for MRI examination in patients implanted with the evaluated device is 30 min with a scanner operating at 1.5T (Tesla) or less.

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13.Note

This above surgical technique is also applicable for straight broad plate 4.5mm & metaphyseal plate small & narrow & also use for straight small plate.

1	0201	LIFT - STRAIGHT SMALL PLATE - 3.5MM(R.U.)
		4H TO 8H
		9H TO 12H
2	0202	LIFT - STRAIGHT NARROW PLATE - 4.5 / 5MM(H.T.)
		6H TO 8H
		9H TO 12H
		13H TO 16H
3	0208	LIFT METAPHYSEAL PLATE -SMALL - 3.5MM
		4H , 6H
		8H, 10H
4	0209	LIFT METAPHYSEAL PLATE -NARROW - 3.5MM
		3.5/4.5/5MM
		5+4H
		5+6H , 5+8H
		5+10H

Straight Narrow Plate

Cat No. For SS	0202
Cat No. For Tit.	1302
Available in	Universal
No. of Holes	4 to 16
Locking Screw	5.0 mm
Cortical Screw	4.5 mm

Profile

Thickness : 4.0 mm
 Width : 13.5 mm
 Fixation with 5.0 and 4.5 mm screw.

Indication

midshaft fracture of humerus and tibia.

Features

- uniform hole spacing
- compression & neutral screw position,
- combi holes allows placement of conventional cortical and cancellous bone screw on one side and threaded locking screw on the opposite side of each hole.
- locking screw mate with threaded portion of combi hole to form a fixed-angle construct.

Use

Fracture for Humerus, Tibia.



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LIFT HEX, CORTICAL SCREW	CAT NO. 1104
4.5 MM - 14 TPI	
LIFT STAR CORTICAL SCREW	CAT NO. 0804
4.5 MM - 14 TPI	



10MM TO 50MM (AT THE DIFFERENCE OF 2MM)

LIFT HEX, LOCKING SCREWS - 5.0MM	CAT NO. 1136
LIFT STAR LOCKING SCREWS - 5.0MM	CAT NO. 0826



(DIFF. OF 2MM UPTO 50MM & AFTER THAT 5MM UPTO 100MM)

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<p>LIFT - DRILL SLEEVE 4,3 MM-S.S. LIFT - DRILL SLEEVE 4,3 MM-TIT.</p> <p>CAT NO. 600,06 CAT NO. 3036,08</p> 	<p>LIFT - DRILL BIT 4,3 MM LIFT - DRILL BIT 3,2 MM</p> <p>CAT NO. 600,16 CAT NO. 600,15</p> 
<p>LIFT - HEX. SCREW DRIVER 5 MM LIFT - STAR SCREW DRIVER 5 MM</p> <p>CAT NO. 600,21 CAT NO.</p> 	<p>LIFT - DEPTH GAUGE 5 MM with Scale</p> <p>CAT NO. 255,11</p> 
<p>LIFT - K-WIRE 2,0 / 2,5 MM</p> <p>CAT NO. 1201</p> 	<p>LIFT - DRILL GUIDE 3,2/4,5 MM</p> <p>CAT NO. 600,05</p> 
<p>LIFT - BONE TAP 4.5 MM</p> <p>CAT NO. 600,03</p> 	

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LIFT HEX. CANCELLOUS SCREWS-5MM* CAT NO. 1135
THREADED HEAD

LIFT STAR CANCELLOUS SCREWS-5MM* CAT NO. 0835
THREADED HEAD



(35MM TO 100MM DIFF. OF 5MM)

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Instruments:

Ø4.5mm torque limiting screw driver



Ø hex screw driver 5mm



Ø5mm depth gauge



drill sleeve 4.3mm S.S.



Bone tap 4.5mm



Drill bit 4.3

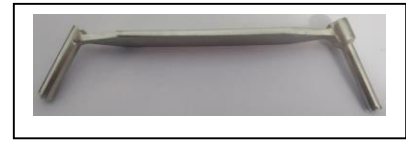


Ø4.3mm drill bit quick coupling 5"



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Lift drill guide 3.2/4.5MM



2mm K wire



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Implant Size:

4.5mm straight narrow Plate:

SS	TIT
0202	1302

5mm locking screw:

hex locking screw 5.0mm (diff. of 2mm up to 50mm & after that 5mm up to 100 mm)

4.5mm cortical screw

hex cortical screw 4.5mm (differenc. of 2mm 10 to 50mm)

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