For Canthal Tendon Procedures

Titanium Wire With Barb and Needle

Surgical Technique
# Table of Contents

## Introduction

Titanium Wire With Barb and Needle  
Indications  

## Surgical Technique

Preoperative Planning  
Surgical Approaches  
Reduce Fractures  
Locate Tendon  
Capture Tendon  
Plan Tendon Position  
Place Tendon  
Drill Transnasally  
Pass Wire Transnasally  
Remove Needle  
Apply Tension  
Secure Wire  
Postoperative Considerations  

## Product Information

Implant  

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**MR Information**

The Titanium Wire with Barb and Needle System has not been evaluated for safety and compatibility in the MR environment. It has not been tested for heating, migration or image artifact in the MR environment. The safety of the Titanium Wire with Barb and Needle System in the MR environment is unknown. Scanning a patient who has this device may result in patient injury.
Titanium Wire With Barb and Needle

Features
- Manufactured from titanium and titanium alloy
- Versatile 28 gauge wire size
- Permanently affixed barb
- Straight taper-point needle
- Compatible with titanium bone fixation systems
- Available in single-use sterile packs

Benefits
- Minimal MRI scatter
- Minimizes palpability while providing adequate strength
- Facilitates capture of medial canthal tendon
- Facilitates transnasal wire passage and minimizes damage to tendon
- Prevents galvanic corrosion when used with titanium plates and screws
- Convenient and easy handling

Indications
DePuy Synthes Titanium Wire With Barb and Needle is indicated for use in soft tissue approximation and/or ligation, for canthoplasty, canthopexy, and/or canthal tendon repair.

Please see the package insert for a complete list of contraindications, warnings and precautions.

Warnings:
- These devices can break during use (when subjected to excessive forces or outside the recommended surgical technique). While the surgeon must make the final decision on removal of the broken part based on associated risk in doing so, we recommend that whenever possible and practical for the individual patient, the broken part should be removed.
- Medical devices containing stainless steel may elicit an allergic reaction in patients with hypersensitivity to nickel.

* Ti-6Al-7 Nb
Technique Overview and Planning

Technique Overview
– Preoperative Planning
– Medial Canthal Tendon Repair
– Postoperative Considerations
– Product Information

Preoperative Planning

Canthal tendon repair using the DePuy Synthes Titanium Wire With Barb and Needle, can be performed in patients whose medial canthal tendon was detached from the bone segment as the result of trauma or surgical approach.

Note: When the medial canthal tendon remains attached to a large bone fragment in the case of trauma, anatomical reduction and stabilization of the bone fragment is sufficient in most cases.¹

The bony skeleton must be properly restored before canthopexy, by reduction and osteosynthesis of the fragments. The normal distance between the canthal tendons is approximately half the interpupillary distance.¹

Note: In an adult, the normal intercanthal distance is approximately 32–35 mm.

It is recommended that the lacrimal duct be intubated prior to the start of the procedure.
Reduce Fracture and Locate Tendon

1

Surgical approaches
In the case of serious injury, a coronal approach is usually necessary to stabilize the bony fragments.

2

Reduce fractures
Reduce and stabilize all fractures. Before canthal tendon reattachment, the bony-cartilaginous framework must be precisely repaired.

Notes:
- If the medial canthal tendon is attached to a bone fragment, repositioning and plating the fragment generally leads to the most anatomic appearance.
- After securing the wire, access to the internal orbit will be limited, therefore orbital wall reconstruction should be completed before canthal resuspension.

3

Locate tendon
Locate the traumatized medial canthal tendon. The tendon may be identified from inside the coronal flap, through a small skin incision, or alternatively, through a caruncular incision. These incisions provide direct access to the tendon which is detached from the bone in most cases.

The lacrimal fossa can be used as a point of reference when locating the medial canthal tendon.

Precaution: The approach to the medial canthal tendon is posterior to the lacrimal duct and should not impinge on the lacrimal system.

If using the skin or caruncular incision, the tendon does not necessarily need to be visualized to complete this procedure.
Capture Tendon

4

Capture tendon

To capture the canthal tendon with the barb on the wire, the needle is guided through a small skin incision below the medial canthus through the site of greatest resistance (approximately 2 mm medial to the canthus). The titanium wire is then guided through the coronal flap until the barb captures the canthal tendon.

Note: If the medial canthal tendon has been severely traumatized, wire fixation may not be possible. Another method of fixation may be required.

Precautions:
- In handling titanium wire, care should be taken to avoid damage from handling, such as kinking or excessive twisting.
- Avoid crushing or crimping damage due to application of surgical instruments such as forceps or needle holders.
Alternate Method: Instead of a skin incision below the medial canthus, an incision can be made in the caruncula. By using a caruncular incision, the barb will become engaged in the substance of the tendon after the needle and wire are passed through it.*

* For additional information on the caruncular approach, please refer to the surgical technique video.
5  
**Plan tendon position**

Proper tendon repair includes positioning the canthal tendon posterior and superior to the lacrimal fossa.³

6  
**Place tendon**

To facilitate tendon placement, a 1.3 mm or 1.5 mm titanium adaption plate should be placed on the frontal bone, extending along the medial orbital wall.³ Cut and contour the plate to fit the patient’s anatomy. Insert at least three 1.3 mm or 1.5 mm bone screws to affix the plate to the bone.

**Notes:**

– The most inferior-posterior screw hole in the plate must be located at the planned position of canthal tendon resuspension and must remain empty to allow passage of the titanium wire transnasally.

– In cases with minimal bone loss, an adaption plate may not be necessary for canthal tendon repair. Other methods used for ensuring the posterior and superior pull of the canthal tendon include the use of medial orbital bone grafts and passage of the titanium wire through the posterior portion of the perpendicular plate of the ethmoid bone.²

– Plate placement may depend on availability of sufficient bone.
Drill and Pass Wire Transnasally

7
Drill transnasally

Using a 2.0 mm to 2.4 mm diameter drill bit, drill transnasally, from the nonaffected orbit to the affected orbit.

Precautions:
- Use a drill sleeve to protect the soft tissue and globes when drilling.
- Drill speed rate should never exceed 1,800 rpm, particularly in dense, hard bone. Higher drill speed rates can result in: thermal necrosis of the bone, soft tissue burns, an oversized hole, which can lead to reduced pullout force, increased ease of the screws stripping in bone, suboptimal fixation, and/or the need for emergency screws.
- Avoid damaging the plate threads with the drill.
- Always irrigate during drilling to avoid thermal damage to the bone.

Note: In cases of severe comminution, drilling may not be required. The use of a transnasal awl may facilitate wire passing.¹

8
Pass wire transnasally

This can be accomplished using a perforated awl or with the aid of a large cannula serving as a guide for the wire.

Alternate Method: Prior to securing the plate to the bone, the wire can be passed through the inferior-posterior screw hole, then directed forward within the orbit.

After the plate is secured to the bone, the wire may be directed anteriorly to be secured on the ipsilateral supraorbital rim or frontal bone.
Remove Needle

Remove needle

Remove the needle by cutting the wire directly below the needle crimp.

Precaution: Exercise caution when handling surgical needles to avoid inadvertent needle sticks. Discard used needles in appropriate “sharps” containers.
Apply Tension

10

Apply tension

Apply moderate tension, and visually check the position of the canthal tendon. For stable fixation, the canthal tendon must be moved into the desired position in a completely relaxed state.
Secure Wire and Postoperative Considerations

11
Secure wire
Secure the titanium wire to stable supraorbital rim or frontal bone on the nonaffected side.

Precaution: Ensure fixation of the wire before closure.

Postoperative Considerations
Frequent examination of visual acuity during the first 24 hours postoperatively is recommended.
Product Information

493.104.01S  28 Gauge (0.31 mm diameter) Titanium Wire, 500 mm, with barb and needle, sterile

For detailed cleaning and sterilization instructions, please refer to www.synthes.com/cleaning-sterilization or sterilization instructions, if provided.

References

Note: For additional information, please refer to package insert.
Limited Warranty and Disclaimer: DePuy Synthes products are sold with a limited warranty to the original purchaser against defects in workmanship and materials. Any other express or implied warranties, including warranties of merchantability or fitness, are hereby disclaimer.

Please also refer to the package insert(s) or other labeling associated with the devices identified in this surgical technique for additional information.

CAUTION: Federal Law restricts these devices to sale by or on the order of a physician.

Some devices listed in this surgical technique may not have been licensed in accordance with Canadian law and may not be for sale in Canada.

Please contact your sales consultant for items approved for sale in Canada.

Not all products may currently be available in all markets.