Titanium Wire with Barb and Needle.
Surgical Technique Guide for Canthal Tendon Procedures.
Warning
This description alone does not provide sufficient background for direct use of the instrument set. Instruction by a surgeon experienced in handling these instruments is highly recommended.

Reprocessing, Care and Maintenance of Synthes Instruments
For general guidelines, function control and dismantling of multi-part instruments, please contact your local sales representative or refer to: www.synthes.com/reprocessing
Indications
The Synthes Titanium Wire with Barb and straight Needle is indicated for use in soft tissue approximation and/or ligation, for canthoplassty, canthopexy, and/or medial canthal tendon repair.

Features
- Manufactured from titanium and titanium alloy
- Versatile 28 gauge (0.31 mm diameter) wire size
- Permanently affixed barb
- Straight taper-point needle
- Compatible with titanium bone fixation systems
- Available in single-use sterile packs

Benefits
- Convenient and easy handling
- Facilitates capture of the medial canthal tendon
- Minimizes palpability while providing adequate strength
- Prevents galvanic corrosion when used with titanium plates and screws

Technique Overview
- Preoperative Planning
- Medial Canthal Tendon Repair
- Postoperative Considerations
- Product Information
Canthal tendon repair using the Synthes Titanium wire with Barb and straight Needle is indicated when the medial canthal tendon is detached from the bone as the result of trauma or a 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.

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.\(^2\)

It is recommended that the lacrimal duct be intubated prior to the start of the procedure.
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, or through a small skin incision, or alternatively through a caruncular incision. These incisions provide direct access to the tendon.

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

**Note:** 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 incision, the tendon does not necessarily need to be visualized to complete this procedure. The tendon can be palpated by using the needle to find the area of most resistance.
Capture canthal 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) toward the inside of the coronal flap. The titanium wire is guided through this flap until the barb captures the canthal tendon.

Instead of a skin incision below the lid margin, an incision can be made in the caruncula.

Alternatively: By using the caruncular incision, the barb will become engaged in the substance of the tendon after the needle and wire are passed through it.

Notes:
- If the medial canthal tendon has been severely traumatized, wire fixation may not be possible. Another method may be required.
- 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.
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Plan tendon position

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

6

Tendon placement

To facilitate tendon placement, a titanium adaption plate should be placed on the frontal bone, extending inferiorly and posteriorly toward the medial orbital wall. Cut and contour the plate to fit the patient's anatomy. Insert at least three 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 re-suspension 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.
- Plate placement may depend on availability of sufficient bone.
7
Drill transnasally

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

Notes:
- Use a drill sleeve to protect the soft tissue and globes when drilling.
- In cases of severe comminution, drilling may not be required. The use of a transnasal awl may help facilitate wire passing.

8
Transnasal passage of the wire

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

Alternatively:
The wire can be passed through the posterior plate hole, then come forward within the orbit to be fixated to the supraorbital/ frontal bone.

After tightening the final screw, the wire may be directed anteriorly to be fixated on the ipsilateral supraorbital or frontal bone.

9
Remove needle

Remove the needle directly under the needle crimp.

Note: Exercise caution when handling surgical needles to avoid inadvertent needle sticks. Discard used needles in "sharps" containers.
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.

11

Secure wire

Secure the titanium wire to the supraorbital rim on nonaffected side.

Note: Ensure proper fixation of the wire before closure.

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Postoperative considerations

Frequent examinations of visual acuity during the first 24 hours postoperatively are recommended.
Canthal Tendon Wire with Barb and Straight Needle, 28 Gauge (0.31 mm diameter), length 500 mm, sterile

References
