Evolution of Endoscopic Achilles Tendon Surgery

Endoscopic Achilles tendon surgery has been developed from the tendency of minimal invasive surgery (MIS). Especially as we have soft tissue problems up to 15% after open Achilles tendon surgery.

Problems of open surgery is, in some cases, a severe soft tissue breakdown (Fig. 1), more often after major Achilles tendon reconstructions, which needs a soft tissue coverage with free flap. To address these problems the minimal invasive surgery (MIS) was developed. The disadvantages of MIS are poor visualisation of sensitive structures and nerves, poor identification of the pathology of the tendons and no visual control of surgical procedures.

Endoscopic Achilles tendon surgery was inaugurated by the author 2009 and constantly applied for acute Achilles tendon ruptures, Midportion tendinopathies, chronic Achilles tendon ruptures, infect/defect situations after Achilles tendon surgery.

Since 2010 in those indications I haven’t performed in open procedures anymore.

Midportion tendinopathy

The treatment options are conservative with 25% to 45% failure rate. Open surgical procedures with postoperative complications in between 5% to 12%. The hypothesis in 2009 was that a less invasive endoscopic procedures could achieve the same results as open procedures and minimize postsurgical complications.

Technique Midportion Tendinopathy:

Medial stab incision proximal to the Calcaneus insertion and at the proximal aponeurosis. Mobilisation of the skin and underneath the tendon with a moskito clamp. Endoscopic surgery is performed by 4.0 scope and 3.8 mm or 5.0 mm shaver. Complete resection of the anterior “neo vessels” and nerve ingrowth (Fig. 2). Debridement of the peritendineum and longitudinal splitting of the degenerative are as diagnosed in the MRI.

Chronic Ruptures

Clinically, chronic ruptures show an increased dorsiflexion more than 10°- 20° and single heel rise is not possible. The MRI confirms the complete degeneration in mostly the midportion area of the Achilles tendon, which corresponds with the changes in the MRI signals.
Portals for endoscopic technique are medial proximal and distal to the tendon. In most cases a severe degeneration with vessels ingrowth and xanthochromic changes are seen after removing the thickened peritendineum. The complete degeneration is debrided by a 5.0 shaver until normal structures are seen. In most of the cases the extensile shaving of the tendon have resulted in a severe tendon tissue defect and weakening of the tendon stability.

The stabilisation is performed by a PDS 1.3 mm frame suture, with complete tightening/shortening of the tendon in plantarflexion. The defect is filled up by fibrin glue (Tissucol) and platelet rich plasma (ACP).

**Defect/Infect Situation**

In defect situations, a Semi-T-Transfer has to be applied to bring a stable new tissue into the gap. So in prone position a Semi-T is harvested by a tendon stripper in the standard technique. From the medial approach a complete debridement of the scar tissue and a mobilization of the tendons is performed to regain normal Gastrosoleus-Achilles function and kinematics.

A PDS frame suture is applied first in full plantar flexion to tension gastrosoleus-Achilles complex. The Semi-T tendon is pretensioned according to ACL techniques. Then it is inserted distally from medial to lateral and fixed proximal in the aponeurosis in cross over technique and fixed with PDS sutures proximally under maximal tension (Fig. 4). Fibrin glue and platelet rich plasma is also applied to enhance biological healing.

**Conclusion**

Over 8 years 163 midportion tendinopathies, 49 chronic ruptures and 52 Semi-T-Transfers has been successfully performed in the endoscopic technique in all cases. We have no deep infection with major revisions. Only 4 cases with superficial infection from the suture has been treated successfully by antibiotics application and surgical debridement and afterwards short immobilization.