

Achilles tendoscopy for non insertional achilles tendinopathy. A

preliminary study

Abstract

Background: To report the mid-term clinical results of endoscopic assisted surgery for patients suffering from chronic recalcitrant painful mid-portion Achilles tendinopathy who failed conservative management for at least 6 months.

Methods: Descriptive and retrospective case series. Consecutive series of 11 patients, 6 men and 5 women, with a median age of 54 (range 40 – 67) years; 13 Achilles tendons with chronic recalcitrant painful mid-portion tendinopathy treated with tendinoscopy were included. Median follow-up of 87 (27-105) months. We report the symptoms duration, regular sports activity, treatment before surgery, complications and satisfaction after surgery, return to previous sport level, and postoperative VISA-A score. No tendon excision or transfer was performed at the time of surgery. All patients completed at least 20 sessions of supervised physical therapy and did not undertake impact sport activities for 6 months before surgery.

Results: No postoperative complications were reported. Complete satisfaction was obtained in 10 out of 11 patients. The median postoperative VISA-A score was 100 (30-100) points.

Conclusions: The mid-term results in patients with chronic painful mid-portion Achilles tendinopathy undergoing endoscopic debridement are satisfactory.

Level of Evidence: IV.

Key words: Achilles tendinopathy, endoscopic treatment, functional result.

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Introduction

Achilles tendinopathy is a frequent tendinous lesion in sport. Extrinsic factors such as a sudden increase in training intensity or duration and intrinsic factors such as abnormalities in lower limb biomechanics and tendon vascularity may contribute to the development of Achilles tendinopathy.¹ Clinically, chronic tendinopathy is characterized by pain in the tendon, generally at the start and completion of exercise. Usually, pain is not present during exercise and it might interfere with daily activities. If a paratendinopathy is associated, there are local inflammatory signs, and crepitation may be observed. However, the source of pain and its underlying mechanisms are still not fully understood, and many theories try to explain its pathophysiology.² Achilles tendinopathy can occur at the insertion or away from the enthesis, being called insertional or non insertional tendinopathy correspondingly. The occurrence of tendon neovascularization may be associated with pain of chronic mid-portion Achilles tendinopathy,¹ although this common wisdom has recently been challenged. Vascular ingrowth in Achilles tendinopathy is accompanied by a neural ingrowth, which facilitates pain transmission.³ However, it is unclear whether vascularization or the neurogenic component is the predominant factor in tendinopathy.⁴

Conservative management includes relative rest, local ice therapy, eccentric exercises, shockwave therapy and peri- and intra-tendinous injections.^{5,6,7} However, 25 to 45% of patients with persisting symptoms may require operative treatment.⁵ Since the pathophysiology is not fully understood, multiple different procedures aim at totally different goals,⁸ including the attempt to free the tendon

of fibrotic adhesions through open or percutaneous approaches,⁹ eliminate the presence of degenerative nodules excising macroscopically altered segments of tendon,³ attempts to restore vascularization and to stimulate viable cells in order to enhance the healing process with percutaneous longitudinal incisions or to remove the painful nerves around the tendon with minimally invasive tendon stripping procedures or tendoscopy.^{9,10} To obtain optimal results from surgery, some surgeons have tried to achieve all of these goals during surgery, combining features from several procedures. The results of open surgery have been reported to be satisfactory in 50 to 96%¹¹ of patients, but complications such as skin edge necrosis, deep vein thrombosis, superficial wound infection, seroma, hematoma, scarring, and sural nerve irritation have been described¹².

If operative intervention is considered, an endoscopic-assisted procedure may be a valid alternative to treat Achilles tendinopathy because of the possibility of achieving the same goals as with open surgery with the possible exception of removing degenerative tissue from the substance of the tendon. Few reports focus on the results of endoscopic management for Achilles tendinopathy, and the description of the operative technique is often not accurate.

The present study describes our mid-term results of an endoscopic assisted operative procedure for patients suffering from chronic painful mid-portion Achilles tendinopathy, without excision of the tendinopathic area, and focusing on debridement of the ventral aspect of the tendon.

Materials and Methods

We performed a retrospective study of 11 consecutive patients (13 tendons) with chronic Achilles tendinopathy who underwent Achilles tendoscopy. Inclusion

criteria were: clinical and ultrasonographic diagnosis of chronic mid portion Achilles tendinopathy, failure of 6 months of conservative management and at least 2 years of postoperative follow-up. Exclusion criteria were: patients younger than 18, rejection of informed consent, lost to follow up, comorbidities such as diabetes or any rheumatoid disease and use of quinolones for the past 6 months. All patients signed an informed consent paper and the ethics committee of our institution approved the study.

There were 6 men and 5 women with a median age of 54 (range 40 – 67) years, with 8 right and 5 left Achilles tendons. The same surgical team operated all patients. The median follow-up was 87 (27-105) months. No patients were lost to follow up. Patient data was accessed from clinical records and phone interview at 2 moments: at 2 years post-op and at final follow up. All patients presented pain in the mid-portion of Achilles tendon for a mean of time of 12 (10 – 48) months prior surgery. Pain was described as moderate to severe when performing exercise and mild intermittent when at rest. Ten of 11 patients practised recreational and intermittent sport before surgery. Soccer and tennis were the most frequent. There were no professional athletes. All patients performed at least 20 sessions of physical therapy preoperatively. They were not able to participate in impact sports activities and used intermittently NSAIDS prior to surgery. We report on the subjective satisfaction (using Kenneth Johnson scale, i.e. satisfied, satisfied with minor reservations, satisfied with major reservations, insatisfied), time to return to the same sports level, postoperative VISA-A score,³⁰ and postoperative complications.

Operative technique

Patients were positioned prone on the operating table. Using a 4.0 mm endoscope, tendoscopy was performed through 2 portals (Figure 1). The first portal was located 3 cm proximal to the symptomatic area and the second portal 3 cm distal to the symptomatic area. Surgery consisted in endoscopic excision and debridement of all ventral paratenon adhesions of the Achilles tendon and debridement of Kager's fat pad and retrocalcaneal bursa adhesions on the deep tendon surface (Figure 2). No tendon substance was excised. No tenotomy of the plantaris longus tendon was performed (Figure 3). Extreme care was taken to preserve as much as possible the paratenon.

Postoperative rehabilitation consisted in protected full weight bearing in a cam walker for 2 weeks, when supervised physical therapy was initiated. Aerobic exercises and concentric strengthening exercises were initiated at this point as tolerated. All patients were able to walk uphill by 4 weeks, when jogging or light impact activities were initiated.

Statistical analysis

Descriptive statistic tests were performed to evaluate the characteristics of the studied tendinoscopies. Median and interquartile range (IQR) were calculated. All statistical analyses were performed using ®Epiinfo v3.5.3.

Results

Ten of 11 patients reported complete subjective satisfaction (Kenneth Johnson). One week after surgery partial pain relief was observed in all patients. Full pain relief at rest was observed at a median of 9 (6-13) weeks. All patients returned to the same sporting level to preoperative in a median time of 4 (2 – 12) months.

The median postoperative VISA-A score (normal healthy value is 100, being 0 the worst) was 100 (30-100) points at final follow up (100 at 2 years follow up). No complications were registered after surgery, and no patient required a reoperation. One of 11 patients presented an associated ipsilateral tarsal tunnel syndrome which was operated 8 months before the index procedure. This is only unsatisfied patient, with a VISA score of 30, even though he reported no pain in his Achilles tendon.

Discussion

Conservative management, consisting mainly in eccentric exercise programs, is the mainstay of nonoperative approaches in Achilles tendinopathy.⁶ However, in 25 – 45% of the patients conservative management fails, and surgery may be considered.⁴ The source of pain and underlying pathophysiology of tendinopathy of the main body of the Achilles tendon is not fully understood, and neovascularization is accompanied by neural ingrowth towards the damaged tendon area.^{1,3} Different operative procedures have been described to address the supposedly involved elements in the condition, including release of Achilles tendon by paratenon opening, excision of fibrotic adhesions, removal of areas of macroscopically altered tendon, excision of neovascularization, stimulation of healing through longitudinal tenotomies, etc. Open surgery for tendinopathy of the main body of the Achilles tendon produces success rates ranging from 50 to 96%.^{11,14} Postoperative complications have an overall rate of 11%, mainly related (54%) to wound healing and scarring.^{11,12} Open surgery carries a relatively long postoperative rehabilitation period (> 6 months) and delayed patient recovery in terms of full tendon loading activity.¹² Thus, to maintain the high success rates of

open surgery with less morbidity, early functional rehabilitation and better cosmesis, minimally invasive techniques have been developed.¹⁵ Some minimally invasive techniques have been reported, e.g. tendon stripping or paratenon infiltration, with good results,¹⁰ suggesting that the disruption of neovascularization and their accompanying nerves could be sufficient to decrease the symptoms of tendinopathy. Endoscopic surgery for Achilles tendinopathy attempted to obtain optimal operative control through direct visualization,¹⁶ while minimizing risk of postoperative complications. Few studies have been published,¹⁷ with small number of patients reported, with good functional results and no complications, achieving full sports activities at 4.5 months on average.^{15,16,18}

Our study differs from previous ones: we perform endoscopic release and debridement of the ventral aspect of the tendon, which may be of paramount importance as the ventral aspect of the tendon presents greater neovascularization changes and neural ingrowth.³ Indeed, disappearance of these vessels after eccentric exercises or polidocanol injections correlates to good clinical results.¹ Thermann et al.¹⁹ reported a series of 8 patients with mid-portion Aquilles tendinopathy who underwent an endoscopic release and debridement of both ventral and dorsal aspect of the tendon. After 6 months, all patients presented excellent results in terms of pain, function and global satisfaction. This report highlighted the importance of debridement of the ventral surface of the Achilles tendon, though the short length of follow-up and the small series limits its conclusions.

We obtained excellent functional results on 10 of 11 patients. It is important to highlight that the tendinopathic area was not excised. This suggests that it may

be not necessary to excise the tendinopathic tissue to obtain good postoperative results.⁹ Excision of tendon substance may put at risk the tendon, and force the surgeon to consider tendon transfers. As in previous reports using an endoscopic approach, return to previous sports activity with full tendon load was obtained after 4 months. Compared to open surgery, endoscopic technique shortens the return to sports activity time in at least 1-2 months.¹² Moreover, we did not observe complications of wound healing or tendon scarring.

In the present investigation, we undertook ventral debridement of the Achilles tendon, and we did not excise the tendinopathic intratendinous tissue. We suggest that it is not necessary to remove the tendinopathic tissue to obtain pain relief. The only patient in this series with fair result had a concomitant tarsal tunnel syndrome. Therefore, his end result was affected by this latter condition, and, even though Achilles tendinopathy resolved and the tendon was painless, his functional score was decreased by his underlying neuropathic condition.

Our study is limited by its retrospective nature, low number of patients, and the lack of preoperative VISA-A scores. Additionally, other domain specific scores could have been used to evaluate better the final functional outcome. As the possible clinical presentations of non insertional achilles tendinopathy are endless, more patients are needed to be able to strongly suggest the benefits of this endoscopic approach. A systematic review would be useful in the future to be able to deliver a more precise indication for achilles tendinoscopy with reliable results.

Conclusions

In summary, the authors believe that Achilles tendoscopy lowers morbidity and shortens rehabilitation period while producing a high rate of good clinical

outcomes. Ventral debridement of the Achilles tendon should be considered when surgically addressing Achilles tendinopathy, and excision of diseased tendon can be avoided. Further studies with larger series and longer follow-up are required to elucidate which operative technique or endoscopic method is the best alternative in the management of patients with chronic recalcitrant Achilles tendinopathy.

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