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Case report

PERCUTANEOUS AS A MINIMALLY INVASIVE TECHNIQUE FOR ACHILLES TENDON RUPTURE

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Abstract

The Achilles tendon is the strongest tendon in the human body. When the applied force exceeds the tensile capacity of this tendon, which occurs when the ankle bends abruptly under the action of a compressive force, the tendon is at risk of rupture. The incidence of rupture ranges from 18 per 100,000. Certain antibiotics, long-term steroid use, tendinopathy, and other degenerative disorders are known to increase the risk of rupture, yet the leading cause remains traumatic injury, with predominance in men aged 30 to 50 years. There are two types of treatment: conservative and surgical. Recent studies have shown a difference in outcome between non-surgical and surgical treatment. Meta-analyses have shown that non-surgical treatment increases the risk of re-rupture, while open surgery has a risk of early complications and infection. It is necessary to find a solution to minimize the postoperative complications of open surgery, and possible relapses after the application of conservative treatment, treated with plaster immobilization. Therefore, there is a need for the use of minimally invasive surgery, which has been adopted as a smart way to reduce the rate of postoperative infections. It is also clear that the treatment must be tailored to the needs of each patient individually.

Keywords: Achilles tendon, rupture, tendinopathy, traumatic injury, percutaneous technique

Introduction

There is no optimal treatment protocol for treating acute Achilles tendon rupture. The open repair allows the surgeon accurate suturing, thereby reducing the percentage of possible recurrent rupture. However, the large incision itself can lead to potential infection, and possible wound-related complications. Meanwhile, studies have shown favorable outcomes using the conservative treatment, i.e., a 6-week cast[1]. Although, the proportions of the favorable outcomes have been increasing, the possibilities of re-rupture still remain. Thus, it is necessary to overcome these limitations, so less invasive technique is to be performed in an effort to improve further the healing time and to lower the recurrence rate. With percutaneous repair, fewer postoperative complications and a much faster return to baseline physical activity have been reported[1].

Case report

We present the case of a 44-year-old male, with traumatic injury of the right Achilles tendon that occurred right after having sports activity. He described an auditory pop and snap feeling during the time of the injury. Ultrasound of the affected area was made, revealing and confirming the diagnosis of rupture of the right Achilles tendon. Clinically, Thompson sign was positive. The patient was admitted to our hospital. In local anesthesia (Xylocaine: Lidocaine 2:1), 8 incisions of about 1 cm were made. After applying local anesthesia, the patient was placed in a prone position on the operating table. Eight symmetrical mini-incisions were made vertically along the medial and lateral edges of the tendon. Then, a needle (Vicryl 2-0) was inserted into the distal stump of tendon at the very beginning, and 8-shaped suturing was performed using the same exit as an entry point. When the distal end was sutured, the suture was pulled in a distal to proximal direction to double check the reliability of the suture of the distal end. Since the soft tissue of the proximal tendon is fairly thick, a large curve needle can easily reach the layer of the tendon. PRGF was also applied in the same act. Finally, steri-strips were applied at all epidermal incisions.

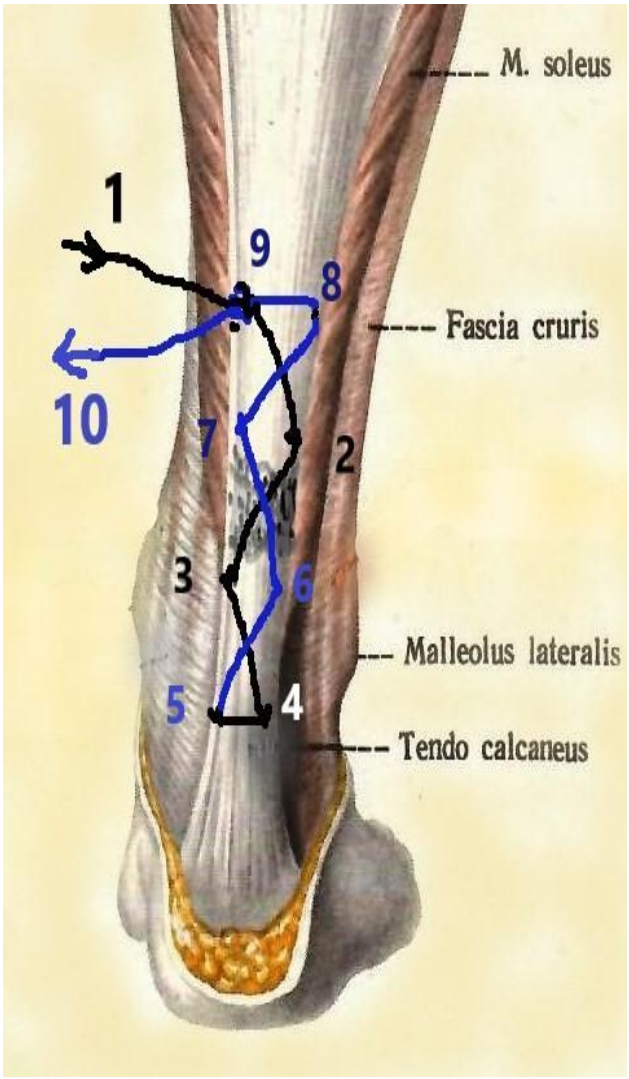

Fig. 1. Anatomical explanation on how 8-shaped suturing is performed

Fig. 2. A **Fig. 2. B.** **Fig. 2. C.**

Fig. 2 A, B and C. Eight symmetrical mini-incisions along the edges of the Achilles tendon were applied intraoperatively, showing how the percutaneous procedure was done

Discussion

Surgical intervention is a preferable treatment for acute Achilles tendon rupture compared to the conservative one. The ideal surgery time are the first 7-14 days, because of the increased vascularity of the affected area. Waiting until the 14th day will allow the tendon ends to remodel, thus making the repair harder and less challenging. There are numerous series over the past 10 years, comparing minimally *vs*. open repair. Wagnon and Akayi compared percutaneous *vs*. open repair over a 7-year period. Clinical and functional results were similar, with 8.6% more wound complications with open surgery, in comparison with the percutaneous group[1]. Cretnik compared 132 percutaneous repair under local anesthesia and 100 open procedures. There were less complications in the percutaneous group (9.7%) and in the open group (21%)[2]. Khan completed a meta-analysis of the surgical interventions. He proved that open surgical treatment had a higher risk of infection, disturbed skin sensibility and skin adhesions (RR 4.89). Percutaneous as a minimally invasive surgery has a higher risk of damaging the sural nerve. Aktas reported similar AOFAS outcome scores. There was better outcome in those repaired using percutaneous than open surgery. In summary, those treated with percutaneous had slightly higher rates of re-rupture and sural nerve damage, but wound complications and hospital stay were considerably higher in those treated with open surgery[3].

Conclusion

Ruptures of the Achilles tendon are becoming more common pathology today. Surgical management has consistently been proven to be the best treatment possible, in comparison to conservative care. Open surgery can be complicated with an increased risk of wound healing issues, possible risk of infection and adhesions[4]. Percutaneous as a minimally invasive repair for Achilles tendon rupture offers good outcome, with less wound complications,

less hospital stays and earlier return to work. Possible increase in risk is in favor of iatrogenic sural nerve injury. Thus, percutaneous type of surgery serves as a good way for proper treatment of Achilles tendon rupture[5-7].

Conflict of interest statement. None declared.

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