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Surgical tip: Repair of acute Achilles rupture with Krackow suture through a 1.5 cm medial wound

T.H. Lui MBBS (HK), FRCS (Edin), FHKAM, FHKCOS*

Department of Orthopaedics and Traumatology, North District Hospital, 9 Po Kin Road, Sheung Shui, NT, Hong Kong SAR, China

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ABSTRACT

Acute Achilles tendon ruptures is one of the commonest tendon injury of the foot and ankle. The management of this problem is still controversial. Treatment can be classified into non-surgical and surgical types. Surgical management can be subdivided into open repair, percutaneous with or without adjunct of arthroscopy. In compare with non-surgical management, surgical management will decrease the tendon re-rupture rate. However, the possible surgical complications including wound breakdown and sural nerve injury are still quite significant. Percutaneous repair technique has the advantage of less chance of wound breakdown, but the rate of tendon re-rupture is higher than that after open tendon repair, because the repair is usually weaker than that achieved in open repair. Lui have described an endoscopic assisted repair with the Krackow locking suture. However, the technique is complicated and six portal wounds are needed. A simpler way of applying the Krackow suture through the portal wound has been described for reattachment of Achilles tendon insertion after endoscopic calcaneoplasty. We describe a mini-open approach of Achilles tendon repair with the Krackow locking suture. By means of release of the medial edge of the investing fascia, the Achilles tendon can be mobilized easily and the Krackow locking suture can be applied through a 1.5 cm medial wound. Hopefully, this can improve the strength of repair and maintaining the advantage of minimally invasive tendon repair.

1. Introduction

Acute Achilles tendon rupture is one of the commonest tendon injury of the foot and ankle. Acute Achilles tendon ruptures typically affect men in the third and fourth decades of life. It most commonly affects those participating in physically demanding work or strenuous recreational activities. The management of this problem is still controversial [1]. Treatment can be classified into non-surgical and surgical types. Non-surgical management includes cast immobilization or functional bracing with functional rehabilitation. Surgical management can be subdivided into open repair, percutaneous with or without adjunct of arthroscopy [2,3]. In compare with non-surgical management, surgical management will decrease the tendon re-rupture rate, early functional treatment, less calf atrophy and stronger push off [4]. However, the possible surgical complications including wound breakdown and sural nerve injury are still quite significant. Percutaneous repair technique [5] has the advantage of less chance of wound breakdown, but the rate of tendon re-rupture is higher than that after open tendon repair, because the repair is usually weaker than that achieved in open repair [6]. Lui has described an endoscopic assisted repair with the Krackow locking suture [7]. However, the technique is complicated and six portal wounds are needed. A simpler way of applying the Krackow suture through the portal wound has been described for reattachment of Achilles tendon insertion after endoscopic calcaneoplasty [8]. We describe a mini-open approach of Achilles tendon repair with the Krackow locking suture. Hopefully, this can improve the strength of repair and maintaining the advantage of minimally invasive tendon repair.

2. Description of technique

The patient is put in prone position with pneumatic tourniquet applied onto the thigh of the affected side. A 1.5 cm wound is made at the medial side of the tendon rupture site. The investing fascia of the Achilles tendon is released at the medial border of the tendon with scissors. This can increase the "working space" and allow the tendon to be mobilized medially to expose the lateral edge of the tendon. The haematoma at the tendon rupture site can be cleared up and the tendon rupture end can be debrided (Fig. 1). The medial side of the proximal tendon segment is retrieved through the wound and the Krackow locking stitch is applied to the medial side of the tendon by means of an eyed needle (ethibond 2 in the illustrated case). Further locking suture can be applied by passing

* Tel.: +852 26837588.
E-mail addresses: luithderek@yahoo.co.uk, luith@ha.org.hk.

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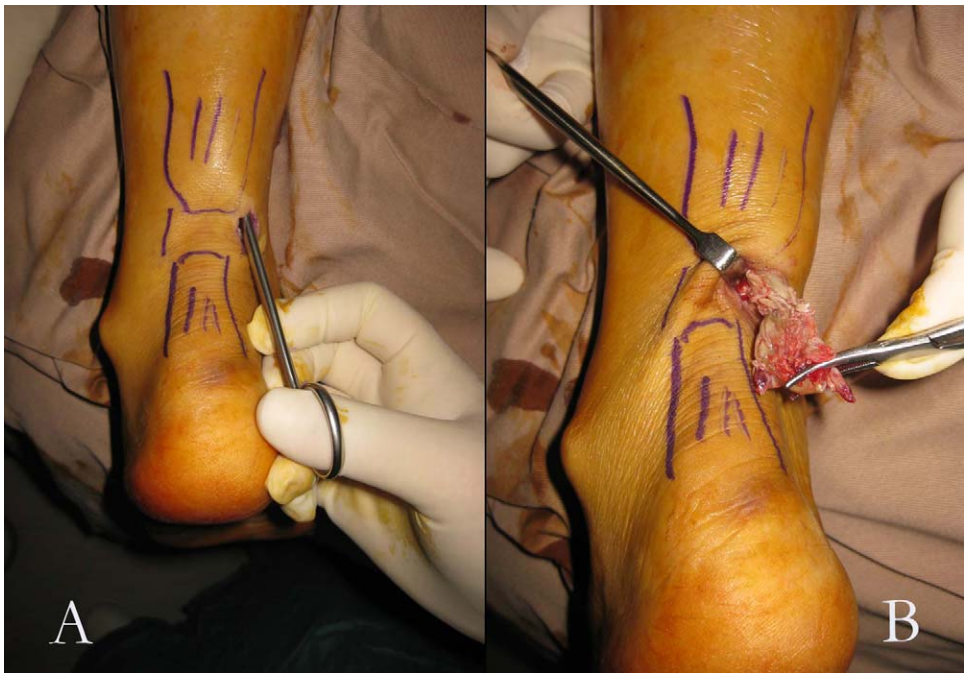

Fig. 1. The investing fascia is released at the medial border of the Achilles tendon with scissors in order to allow easier mobilization of the tendon (A). The degenerate tendon is debrided (B).

the needle through the tendon in deep to superficial direction and exit at the superficial surface of the tendon and then the fascia and skin (Fig. 2). The suture is retrieved at the surface of the tendon with a small haemostat that looped around the suture. By this way, a Krackow locking stitch is created (Fig. 3) [7,8]. By varying the angle of insertion of the needle, 3–4 locking stitches are weaved over the medial side of the tendon. Then the tendon is mobilized medially to expose the lateral side of the tendon and the steps repeated (Fig. 4). The same procedure is then repeated over the distal tendon with another suture. The limbs of the 2 sutures are paired and the tendon ends are approximated with knotting of the sutures and repair of the tendon is then completed (Fig. 5).

Post-operatively, the patient is put in short leg cast for 3 weeks. Weight bearing walking will be started on the fourth post-operative week with the aims of full weight bearing on the seventh post-operative week. Gradual ankle mobilization exercise will be started on the fourth post-operative week. Gradual calf strengthening exercise will be started on the seventh post-operative week.

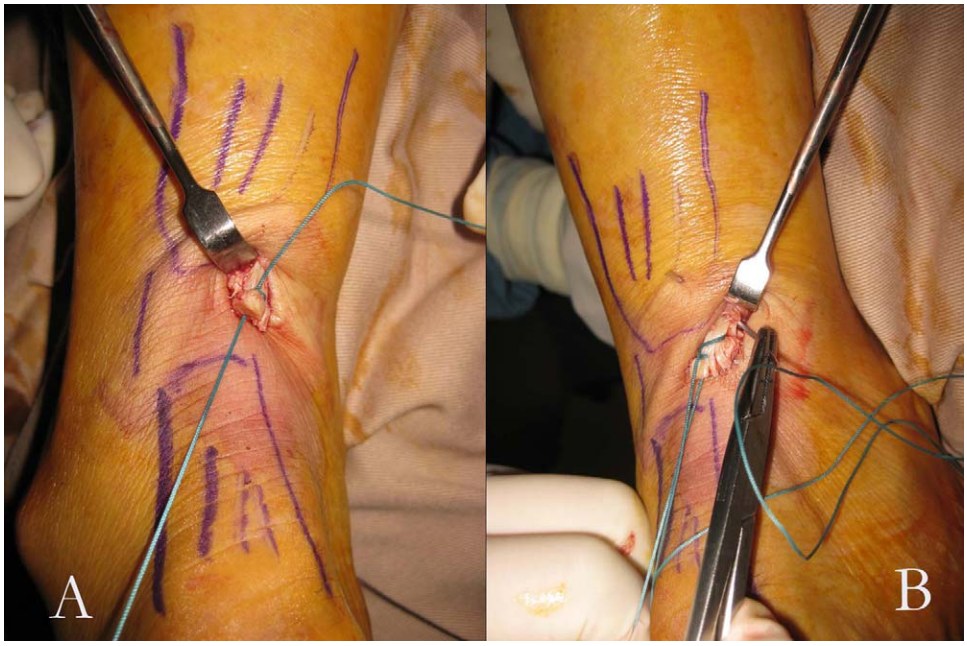

Fig. 2. The medial side of the proximal tendon segment is retrieved through the wound and the Krackow locking stitch is applied to the medial side of the tendon with ethibond 2 suture by means of an eyed needle (A). Further locking suture can be applied by passing the needle through the tendon in deep to superficial direction and exit at the superficial surface of the tendon and then the fascia and skin (B).