

## Research Article

# Outcome analysis of surgically treated Tendo Achilles rupture

Jambu Nageshwaram<sup>1</sup>, Ganesan Ram Ganesan<sup>1\*</sup>, Ramesh Babu Subburayan<sup>2</sup>

<sup>1</sup>Department of Orthopaedics, Sri Ramachandra Medical College, Chennai, Tamil Nadu, India

<sup>2</sup>Spot Hospitals, Chennai, Tamil Nadu, India

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**\*Correspondence:**

Dr. Ganesan Ram Ganesan,

E-mail: ganesanram@yahoo.com

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### ABSTRACT

**Background:** The spectrum of Achilles tendon ruptures includes both acute and chronic injuries. Treatment options include operative repair with postoperative immobilization, operative repair with accelerated rehabilitation using early weight bearing, as well as non-operative treatment. Many surgeons advocate early operative repair of the ruptured Achilles tendon, citing decreased re-rupture rates and improved functional outcome while some surgeons treat them conservatively. In this article we are going to analyse the midterm outcome of surgically treated Tendo Achilles rupture.

**Methods:** Prospective study of thirty cases of surgically managed Tendo Achilles injury treated in Sri Ramachandra medical college and research institute, Chennai, from June 2011 to June 2014. All the patients were followed up completely. Patients were followed periodically at 6 weeks, 12 weeks, 6 months and then yearly. Minimum follow up period was 12 months and maximum follow up period was 42 months. We have evolved our own scoring system and named it as comprehensive SRMC scoring system and all patients were followed using the scoring system.

**Results:** We had 84% good results, 10% fair and 6% poor results as per comprehensive SRMC scoring system.

**Conclusion:** SRMC scoring system for Tendo Achilles is a comprehensive one. It is specific for Tendo Achilles rupture. It includes all parameter for successful scoring system. Surgical treatment of Tendo Achilles gives good results.

**Keywords:** Tendo Achilles, Kessler's technique, Bosworth's technique

### INTRODUCTION

The Achilles tendon is the largest and most powerful tendon in the ankle formed from the fibers of two muscle units: the gastrocnemius muscle, which attaches above the knee to the posterior aspect of the medial and lateral femoral condyles; and the soleus muscle, which originates from the upper part of the posterior tibia, fibula, and interosseous membrane. Like any other tendon in the body, however, it is susceptible to rupture. The spectrum of Achilles tendon ruptures includes both acute and chronic injuries. Treatment options include operative repair with postoperative immobilization, operative repair with accelerated rehabilitation using early weight bearing, as well as non-operative

treatment. Many surgeons advocate early operative repair of the ruptured Achilles tendon, citing decreased re-rupture rates and improved functional outcome while some surgeons treat them conservatively. In this article we are going to analyse the mid-term outcome of surgically treated Tendo Achilles rupture.

### METHODS

Prospective study of thirty cases of surgically managed Tendo Achilles injury treated in Sri Ramachandra medical college and research institute, Chennai, from June 2011 to June 2014. Twenty eight patients were male while two were female. Twenty patients had open injuries and ten had closed injuries. Out of the twenty open

injuries eleven patients had closed injury, eight had road traffic accidents and one cut injury. Out of the ten closed injury five were spontaneous, three from sports activity, one closed and one cut injury.

The average age of patients with open injuries was twenty seven years and closed was forty seven years. Sudden unexpected dorsiflexion of the ankle was seen in fourteen cases, violent dorsi flexion of a plantar flexed foot seven cases, pushing of the weight bearing fore foot in three cases, cut injury in three cases and mechanism unknown in two cases. In all closed neglected injuries, proper history regarding steroid intake/injection into the heel and associated medical illness such as diabetes was recorded.

All open injuries were treated as emergency. The time elapsed after injury was noted. Wound was cleaned and dressing done. Antitetanus prophylaxis, antibiotics and analgesics were given. Injection metrogyl was given intravenously for all open injuries.

Fourteen cases of open injuries were taken within 6 hours to the OT and after thorough debridement; modified Kessler's method<sup>1</sup> with end to end suturing was done. Five cases were operated after 24 hours and one case was operated after six days.

Modified Kessler's method was adopted for suturing in sixteen cases; Bunell's stitch in 1 case and end to end repair in 3 cases of partial ruptures. Two cases of closed injuries were treated by Modified Kessler's technique. Five cases of neglected rupture were treated by Bosworth's technique.<sup>2</sup>

Lindholm procedure<sup>3</sup> was done for one case of spontaneous Tendo Achilles rupture. Peroneus brevis tendon was used in one case of steroid induced TA rupture.

Post operatively, above knee POP slab was given for two weeks with ankle in equinus and knee in 30 degree flexion. Sutures were removed between 12 to 14 days. Above knee POP was continued for two more weeks. Below knee POP cast in minimal equinus for two weeks. Followed by below knee walking POP in neutral position for weight bearing two more weeks. The period of immobilization varied with the merit of the case. None of the patients were immobilized for more than three months. The patients were asked to do active range of motion exercises and strengthening exercises. Heel raise chapels were given for 50% of neglected ruptures.

All the patients were followed up completely. Patients were followed periodically at 6 weeks, 12 weeks, 6 months and then yearly. Minimum follow up period was 12 months and maximum follow up period was 42 months. We used comprehensive SRMC scoring system as per Table 1 for follow up.

**Table 1: Comprehensive SRMC scoring system.**

Components	Sub divisions
Quality of life	A. Patient back to his/her occupation as preinjury status - 10
	B. Patient was back to his occupation but not able to perform normally - 05
	C. Change of occupation - 00
Tendon strength by apparatus	A. 10 or more kg - 10
	B. 2.5 to 10 kg - 05
	C. less than 5 kg - 00
Wound healing	A. Healed in time without complication - 10
	B. Minimal wound dehiscence - 08
	C. Wound dehiscence requiring resuturing - 06
	D. Superficial infection - 04
	E. Deep infection - 02
	F. Required skin/flap cover to heal - 00
Tendon geometry	A. Normal - 10
	B. Tenderness/adherence to skin - 05
	C. Rerupture - 00
Pain	A. No pain - 10
	B. Pain on jogging - 08
	C. Pain on running - 06
	D. Pain on walking and squatting - 04
	E. Rest pain - 00
Strength	A. Hopping and jumping on single leg (operated) - 10
	B. Ability to stand with single heel raise (operated) - 08
	C. Ability to stand with both heel raise - 06
	D. Ability to squat without support - 04
	E. Ability to squat with support - 02
Gait	A. Walking without limp - 10
	B. Walking with limp - 00
Range of movements ankle	A. Normal range of movement - 10
	B. Abnormal range of movements - 08
	C. Restricted <50% - 06
	D. Restricted >50% - 02
Calf atrophy	A. Calf atrophy without influencing the result - 10
	B. Calf atrophy with negative influence in result - 05
Patient satisfaction	A. Satisfied - 10
	B. Partially satisfied - 05
	C. Unsatisfied - 00
<b>Total score - 100</b>	
<b>Scores between 75 to 100 - Good</b>	
<b>Scores between 50-75 - Fair</b>	
<b>Scores less than 50 - Poor</b>	

## RESULTS

We had 83.3% good results as per our comprehensive SRMC scoring system. Complications rate in our series

were minimum. The results and complications were tabulated in Table 2 and 3 respectively.

**Table 2: Results as per comprehensive SRMC scoring system.**

No of cases	Results	Percentage
25	Good	83.3%
03	Fair	10%
02	Poor	6.7%

**Table 3: Complications.**

Components	No.
Hypothesia (sural nerve distribution)	3
Calf atrophy	5
Deep vein thrombosis	Nil
Rerupture	Nil

## DISCUSSION

Various scoring systems were used to assess the surgical outcome of Tendo Achilles repair. They were Ankle Hind Foot Scale (AOFAS),<sup>4,5</sup> Leppilhati et al.,<sup>6</sup> Tegner activity score.<sup>7,8</sup> All these systems had its own merits and demerits. Because of these demerits, we had evolved our own scoring system and named it as comprehensive SRMC scoring system. Ankle hind foot scale<sup>4</sup> device by American Foot and Ankle Society. This scale was based upon factors like pain, alignment and function. The merits of this system was that it scale grades ankle, subtalar, talonavicular and calcaneocuboid joint levels. It can be used for various foot and ankle problem. Its demerits were patient's satisfaction and the qualities of life following surgery were not discussed. Leppilhati et al.<sup>6</sup> scoring scale was based on subjective assessment of Clinical factors. Its merit is that it uses Isokinetic dynamometer evaluation for strength. Demerits were time consuming, expensive and not widely available.

Tegner<sup>8</sup> activity scoring system was mainly based on functional activities following surgery. Maximum score of 10 indicates competitive sports activity and a score of 2 indicates an activity level equal to working in office. Its merits were it is commonly used following knee injuries and discriminates competitive and recreational sports. Demerits were its failure to precisely define sports activity level according to a specific sport and intensity of participation and the failure to detect significant symptoms. Because of the pitfalls in the available scoring system, we had evolved our own comprehensive SRMC scoring system which includes all necessary parameters. All our cases were followed by this system.

In our study 90% are males, and the male: female ratio is 9:1. This is almost similar to that noticed by Nicola Maffulli<sup>9</sup> who had 12:1 ratio. The range of age was 13 to 62. Average age in open injuries is 28 years and in closed

injuries is 47 years. This age interval was similar to the study by A. G. Jennings et al.<sup>10</sup> In our series closet mode injuries were the commonest injury (46.15%) among the acute injuries. Whereas 83% of injuries were sports related injuries when compared to Nicola Maffulli et al.<sup>9</sup> We had 40.9% neglected ruptures while Nicola et al had only 20 % of neglected rupture. Our technique of modified Kesslers method with end to end repair for open injuries gave good results. Late presentation of an open injury in our series was the cause of poor result which influenced the prognosis. Associated injuries which was found in one of our case was undisplaced fracture of the lower end fibula with posterial tibial nerve and artery injury, this was also reported by S. D. Vyas and P. M. Rai from Mangalore.

Surgical treatment of acute rupture of Tendo Achilles led to fewer reruptures and better patient generated ratings than did non-surgical treatment.<sup>11</sup> The average periods of Immobilization in open and close cases are 7 and 9 weeks respectively in our series. Early restricted motion with a brace instead of rigid immobilization reduced the incidence of scar adhesions and early return to normal activities.<sup>12</sup> 10% of our cases (Table 3) had hypothesia over sural nerve distribution whereas 6.25% is noted by A. G. Jenings et al. The sural nerve was at a mean of 18.8mm from the lateral border of the TA from where it crosses at a distance of 9.8 cm from the calcaneum and the proximal course of the nerve was towards the mid line. Arner and LindHolm<sup>13</sup> reported 4 cases of re rupture and 2 cases of thrombosis as complications in a series of 92 patients. In our series we didn't have any complication of rerupture or deep vein thrombosis. We have noticed calf atrophy in 5 of our cases where only 1 case had negative influence on outcome (Table 3). When the leg was immobilized the muscle spindle relaxes and afferent impulses to type 1 fibers cease causing the calf muscle atrophy.

## CONCLUSION

Surgical treatment of Tendo Achilles gives good results. Delay in surgical repair adversely affects the outcome. Comprehensive SRMC Scoring system for Tendo Achilles is a comprehensive one. It includes all parameter for successful scoring system. It is specific for Tendo Achilles rupture. After validation of our comprehensive SRMC scoring system it can be used worldwide.

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