INTRODUCTION: Achilles tendon rupture usually occurs in recreational athletes of middle age 30-50 years and a typical place of the rupture is 3-5 cm above the insertion of the heel bone. Most common in recreational athletes.

OBJECTIVE: To view the surgical technique suture the tendon with a guide “Achillon” the functional outcome of acute injuries.

MATERIAL AND METHODS: retrospective analysis included a total of 20 patients treated at the Clinic of Orthopedics and Traumatology, Clinical Center of Montenegro in Podgorica in the 2009-2014. They were monitored for 12 months. Diagnosis is based on history, clinical examination Thompson’s Simmond, O’Brien test, ECHO and NMR.

RESULTS: The average age was 38.8 ± 2.79 years 21-52 years. Right in 14 respondents 70%, the left side in 6 30%. There were no complications as: infection, thrombosis, rerupture and embolism. Functional results tables we have shown through specific scores.

CONCLUSION: It can be concluded that this procedure provides a simple and quick surgical technique, a small percentage of complications, shorter immobilization time and good functional results.

Key words: tendon rupture, complications guide “Achillon”

INTRODUCTION

Incidence of injuries is about 0.2% in the general population in the United States, the incidence was 18 per 100 000 inhabitants.

On average, 75% of ruptures of the Achilles tendon described in the literature are related to sport, especially sports that require sudden accelerations, jumps and sudden changes in direction, also called pivot sports. Among them, 10 to 20% occur among professional athletes, 70% among sports and leisure and 10% in patients who do not practice any sport. Only 10% of patients with ruptured tendon Achilles have a history of chronic achillodynia.

The exact pathogenesis of rupture of the Achilles tendon remains unclear. The four most discussed theories at present are:

1. chronic tendon degeneration,
2. inhibitor deficiency challenge the protective mechanism of the unit musculotendinitis proprioception
3. repetitive micro-trauma
4. it is established that certain medications and diseases. Systemic are incriminated as a cause fluoroquinolones and cortisone, RA.

The Achilles tendon represents the conjoined tendon of triceps surae muscle. Thereof is formed medial and lateral heads of the gastrocnemius muscle and soleus. Mechanically, the Achilles tendon is the largest tendon of the body and is able to bear tensile load to 10 times the weight of the body.

The mechanism of rupture of the Achilles tendon is the most eccentric contraction in dorsiflexion of the ankle and knee extension when soleus and gastrocnemius in maximum tension. Infringement occurs in athletes and fitness enthusiasts usually in tennis, gymnastics, skiing, handball, football, basketball, track and field.

The vascular supply to the Achilles tendon, however precarious, with a minimum density in the middle third of the tendon, whereas an area of "hypovascularità" on 4 cm above the calcaneal tuberosity. Moreover, it is precisely at this level that occur most tendon ruptures.

MATERIAL AND METHOD

Diagnosis is based on history and clinical examination Simmond’s, Thompson, O’Brien test, ultrasound findings ECHO, magnetic resonance imaging MRI.

This paper shows one minimally invasive techniques suture of fresh injured Achilles tendon with a guide Achillon that we carried out on a total of 20 patients treated at the Clinic for Orthopaedic Surgery and...
Traumatology, Clinical Center of Montenegro in Podgorica in the period from 2009 to 2014. Men represented 98%. The highest number of injuries is for recreational athletes

Side of rupture in 16 (80%) was in “typical side” in 3 (15%) of respondents was in the proximal muscle tendon transition and in 1 (5%) of respondents was over the distal insertions.

All operated patients were subjected to surgical treatment within the first 48-72 hours of injury. Anesthesia was spinal or local infiltration. All patients received antibiotic and thromboprofilaxis. No tourniquet is needed. During the administration of local anesthesia 10 patients special attention must be paid to the lateral side, particularly proximally, where sural nerve.

The average age of all patients was 38.8 ± 2.79 years 21-52 years, the right side was present in 14 70%. Rupture cause was in 30% of the basketball, football 40%, 15% running, tennis 5%, other activities 10%.

SURGICAL TECHNIQUE

Technically, before starting, the ruptures and diastasis gap must be identified. The incision is begun just medial to the gap or soft spot in the tendon and is extended to 2 cm proximally. The skin and subcutaneous tissue are gently retracted with hooks, and the paratenon is identified, carefully opened, and tagged with stay sutures. Both stumps of the ruptured tendon are identified, and the exact site of rupture is carefully noted. The Achillon instrument guide is introduced under the paratenon, in a proximal direction. The surgeon should feel the tendon lying between the two branches of the instrument. It allows to “catch” the proximal stump of the ruptured tendon, without additional incising the soft tissues. A series of wires passed through the branches of the instrument by means of a needle with resorbable thread Vicril-polyglactin 2, Ethicon 2. These wires pass also through the tendon that is located between the legs of the instrument. The device is finally removed and the wires, attached tendon, are pulled distally. The same sequence is followed for the distal stump. The two tendon stumps are so close to one another and are knotted together (Figures 2,3).

Rehabilitation protocol is divided into four phases: during the first 21 days, the ankle is immobilized at 30°, then another 7 days at 20 degrees plantar flexion, 7 days at 10 degrees when allowed weight bearing of 10 to 20 kg with a walk with crutches. After 35 days immobilization is in the neutral position with the full weight bearing.

The patient is then allowed to walk with full weight bearing; splint can be removed daily to allow active mobilization exercises.

At the end of the 8th week, the splint is definitively removed and a physiotherapy program intensified with isometric exercises and stretching of the posterior muscles.

RESULTS:

Results are shown as a small tables below.

<table>
<thead>
<tr>
<th>Isokinetic muscle strength score:</th>
<th>95%</th>
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<table>
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<tr>
<th>Others</th>
<th>5%</th>
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</thead>
</table>

Ankle performance score:
Excellent 18
Good 2
Fair 0
Poor 0

Active ROM difference between ankles:
Normal = 5° 19
Mild 6°-10° 1
Moderate 11°-15° 0
Severe =16° 0

Pain:
None 18
Mild, no limitations on recreational activities 2
Moderate, limitations on recreational, but not daily activities 0
Severe, limitations on recreational and daily activities 0

Subjective result:
Very satisfied 18
Satisfied with minor reservations 2
Satisfied with major reservations 0
Dissatisfied 0

Stiffness:
None 17
Mild, occasional, no limitations on recreational activities 2
Moderate, limitations on recreational but not daily activities 1
Severe, limitations on recreational and daily activities 0

Restore the previous physical activity 95%
Average rehabilitation time 2.2 months after removal of brace

SURGICAL TECHNIQUE

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**DISCUSSION**

Despite many different studies and metaanalyses, there is no universal agreement about the optimal management strategy of acute Achilles tendon rupture.

Repeated microtrauma and hipovascularization of tendon are predisposing risk factors for chronic degenerative changes, leading to a rupture without excessive loads, such attitudes are supported angiographic and histological finding.\(^{17,18}\)

The strong force that overstretches the tendon may cause rupture. Frequent microtrauma, leads to decreasing of tendon resistance and excessive loads during sports activities, create morphological alterations in connective and supportive tissue. It leads to tendon rupture. Direct hits and open injuries can also cause tendon rupture.\(^ {2,3,4,5,11,15}\)

Rupture of the Achilles tendon is a common injury among high-level athletes, recreational sports enthusiasts, or even sedentary individuals. Much has been written about the Achilles tendon itself, including its structure, blood supply\(^ {13}\), and biomechanics\(^ {14}\) and there is an abundant amount of literature concerning the epidemiology\(^ {1,2}\), and etiology\(^ {1,2,9,15}\) of Achilles tendon rupture.

Initially, many investigators were convinced that the results of nonoperative treatment were equal to those of surgical repair.\(^ {6}\)

The major factor motivating surgeons to use such a nonoperative approach appears to be the wish to avoid the wound complications that occur with an operative repair. The most commonly reported complications were related to wound-healing, specifically wound necrosis and infection.\(^ {17,18}\)

The adequacy of apposition and fixation of torn ends seems to be crucial with all the methods and techniques. The main advantage of the surgical treatment over non-operative is that in a complete rupture leads to the diastasis of the ruptured area. This causes the tendon to heal in an extended position and leads to loss of normal muscle tonus and weakening of the power and it can be avoided by suture.\(^ {5,19,20}\)

Open repair enables the best visualization and adaptation of the torn ends and the possibility of insertion with different types of strips and tendon parts to reduce the number of reruptures to minimum.\(^ {18,19}\)

It must be stressed that many times the approximation of the torn ends could not be achieved easy with open and particularly with percutaneous repair.\(^ {19}\)

**CONCLUSION**

This new procedure allows the surgeon to precisely visualize and control the tendon ends while avoiding excessive dissection and disturbance of local vascularity and minimizing nerve and wound-healing problems. Such a technique, along with an early functional rehabilitation program, allowed us to achieve a high rate of successful results with minimal morbidity.
The small skin opening allows direct visual control quality and reduction of tendon suture. We emphasize that in these surgical techniques an important detail that is pulling the strings down below paratenon from extracutaneous in peritendinous position protecting sural nerve from damage.

**SAŽETAK**

UVOD: Pucanje Ahilove tetive najčešće se javlja kod rekreativnih sportista srednje `ivotne dobi 30-50 godina i tipičnim mjestom rupture 3-5cm iznad hvatišta na petnoj kosti. Najčešće se javlja kod rekreativnih sportista.

CILJ RADA: prikaz hirurške tehnike suture tetive sa vodičem “Achillon” kroz funkcionalni rezultat lečenja akutne povrede.

MATERIJAL I METODE: retrospektivnom analizom obuhvaćeno je ukupno 20 bolesnika lečenih na Klinici za ortopediju i traumatologiju KCCG u Podgorici u periodu 2009-14.god. Praćeni su tokom 12 meseci. Diagnosa se postavlja na osnovu anamneze, kliničkog pregleda Simmond’s Thompson, O’Brien test, EHO and NMR.

REZULTATI RADA: prosečna starost ispitanika je 38,8±2,79 godina 21–52 godina starosti. Desna strana kod 14 ispitanika 70%, leva strana kod 6 30%. Infekcija, tromboza, reruptura i embolije nije bilo. Funkcionalne rezultate tabelarno smo prikazali kroz specifične skore.

ZAKLJUČAK: Može se zaključiti da ova procedura obezbeđuje jednostavnu i brzu hiruršku tehniku, mali procenat komplikacija, skraćeno vreme imobilizacije, dobre funkcionalne rezultate.

**REFERENCE:**


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