


Clinical outcomes of surgical management of acute achilles tendon rupture with the open technique and effect of tendoflex polytendon complex as a dietary supplement

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Abstract

Aim: In this study, we aimed to evaluate the effect of the use of the oral polytendon complex (Tendoflex Mega-Farma Pharmaceutical Company) as a nutritional supplement after the open repair of Achilles tendon rupture cases on clinical outcomes.

Material and Methods: This study included 29 consecutive patients with Achilles tendon ruptures who had undergone open repair of the Achilles tendon and took postoperative oral Tendoflex treatment as a dietary supplement. Patients have been followed up in the postoperative 8th 12th and 48th weeks. The ranges of motions and visual analog scale (VAS) score for pain was noted. The Achilles tendon Total Rupture Score(ATRS) was also pointed out at the last follow up.

Results: There were no cases of re-rupture. There were no cases of infection and or nerve injury. 48th week follow up results were plantar flexion 47.1 degrees, dorsiflexion 17.8 degrees, eversion 17.1 degrees, inversion 28.2 degrees with a mean VAS score of 0.6 and a mean ATRS of 93.

Conclusion: The open repair of Achilles tendon ruptures has certain advantages like lower re-rupture rates and lower iatrogenic neural injury rates. Including Tendoflex to the treatment protocol, may also have prevented re-ruptures and provided rapid amelioration of pain.

Keywords: Achilles rupture; dietary supplement; open surgery

INTRODUCTION

Achilles tendon, which is the strongest tendon in the body, is vulnerable to ruptures more than any other tendon in the adult body (1). The aging population and the participation in the high demand sports activities cause an increase in the incidence of this injury (2-5). Having an imperative role in walking, injury of this tendon causes prolonged disability and have a long rehabilitation period (6-8).

The optimal treatment method for this injury is still controversial. Open repair via conventional exposures and mini-open approaches or conservative management options, various postoperative rehabilitation protocols have been proposed and are still an issue of debate (9-12). There are many meta-analyses comparing the aforementioned management options. Most of the meta-analyses report that surgical management had lesser re-rupture rates, with an increased rate of wound issues and surgical site infection as disadvantages. Another option

in the treatment of this injury is promoting Achilles tendon healing with the help of biological treatment methods or nutritional supplements. A great variety of nutritional supplements, biological agents, and medication have been proposed (13-17).

In this study, we aimed to evaluate the effect of the use of the oral polytendon complex Tendoflex (125mg methysulfomethane, 100mg L-arginine, 75mg bromelain, 50 mg Vitamin C, and 40 mg type 1 collagen per tablet) (Mega-Farma Pharmaceutical Company) as a nutritional supplement after the open repair of Achilles tendon rupture cases on clinical outcomes.

MATERIAL and METHODS

Ethical approval was obtained from the clinical ethical board of our institution prior to this prospective study. From June 2016 to June 2017, 95 patients have been operated due to acute Achilles tendon rupture at our institution.

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This prospective study included 29 consecutive patients who consented to participate in the study, with Achilles tendon ruptures who had undergone open repair of the Achilles tendon and took postoperative oral Tendoflex treatment as a dietary supplement. Exclusion criteria were as follows: Patients with diabetes mellitus, open injuries, patients with neurologic deficits, patients who couldn't be followed up at least for 48 weeks. Informed consent has been obtained from all of the patients regarding the surgical technique and Tendoflex® treatment.

Surgical technique

Patients were placed prone on the operation table. Thigh tourniquet was used for hemostasis. A 6-8 cm posterior longitudinal incision was made, which follows the medial edge of the tendon. The subcutaneous tissue and fat are retracted until the subcrural fascia. Paratenon is meticulously divided in order to expose the ends of the tendons. Excessive debridement is avoided to prevent overtightening. Primary repair is done with the Krackow

technique and sutured with the ankle in the plantar-flexed position. Interrupted sutures are placed for reinforcement. Paratenon is closed meticulously. Finally, the skin is closed.

Patients have been kept in long leg cast for the first three weeks after the operation and in a short leg cast following three weeks. Patients took two times a day oral Tendoflex® for the following 12 weeks after the surgery.

Patients have been followed up in the postoperative 8th, 12th, and 48th weeks. Additionally, patients were scheduled for a cast change and removal at the 3rd and 6th week after the surgery. The ranges of motions and visual analog scale (VAS) score for pain was noted. The Achilles tendon Total Rupture Score(18) was also evaluated at the last follow up (Table 1).

The cost of the study was funded by the authors, including the cost of the dietary supplement.

Table 1. The Achilles tendon Total Rupture Score (16)

All questions refer to your limitations/difficulties related to your injured Achilles tendon.

Mark with an X in the box which matches your level of limitation!

1. Are you limited due to decreased strength in the calf/Achilles tendon/foot?

0 1 2 3 4 5 6 7 8 9 10

2. Are you limited due to fatigue in the calf/Achilles tendon/foot?

0 1 2 3 4 5 6 7 8 9 10

3. Are you limited due to stiffness in the calf/Achilles tendon/foot?

0 1 2 3 4 5 6 7 8 9 10

4. Are you limited due to pain in the calf/Achilles tendon/foot?

0 1 2 3 4 5 6 7 8 9 10

5. Are you limited during activities of daily living?

0 1 2 3 4 5 6 7 8 9 10

6. Are you limited when walking on uneven surfaces?

0 1 2 3 4 5 6 7 8 9 10

7. Are you limited when walking quickly up the stairs or up a hill?

0 1 2 3 4 5 6 7 8 9 10

8. Are you limited during activities that include running?

0 1 2 3 4 5 6 7 8 9 10

9. Are you limited during activities that include jumping?

0 1 2 3 4 5 6 7 8 9 10

10. Are you limited in performing hard physical labor?

0 1 2 3 4 5 6 7 8 9 10

RESULTS

This study included 29 patients. All of the patients were male. The mean age was 38.5 (range 29-48 years of age). 9(31.0%) of the 29 patients were smokers. There were no cases of re-rupture. There were no cases of deep infection or nerve injury. Four cases had transient superficial infections (Figure 1).



Figure 1. Postoperative 8th-week active dorsiflexion and plantarflexion range of motion of the patient

The mean ankle ROM at the 8th week follow up were as follows: plantar flexion 34.6 degrees, dorsiflexion 7.2 degrees, eversion 12.6 degrees, inversion 20.3 degrees, with a mean VAS score of 8. 12th week follow up revealed a mean plantar flexion 42.4 degrees, dorsiflexion 11.2 degrees, eversion 13.1 degrees, inversion 25.3 degrees with a mean VAS score of 3. 48th week follow up results were mean plantar flexion 47.1 degrees, dorsiflexion 17.8 degrees, eversion 17.1 degrees, inversion 28.2 degrees with a mean VAS score of 0.6 and a mean "The Achilles Tendon Total Rupture Score" of 93 (Table 2).

Table 2. Range of motion values, VAS scores and Achilles tendon total rupture scores of the patients

	8 th week	12 th week	48 th week
Plantar Flexion	34.6	42.4	47.1
Dorsi-flexion	7.2	11.2	17.8
Eversion	12.6	13.1	17.1
Inversion	20.3	25.3	28.2
VAS score	8	3	0.6
ATTR score	-	-	93

All of the data presented in this table are mean values. The range of motion data is presented in degrees. VAS stands for visual analog scale score, ATTR stands for Achilles tendon total rupture score

DISCUSSION

One of the most important outcomes of this study was that there were no cases of re-rupture. The average re-rupture rate of operative management in current studies

is 2% (10,19). Preventing re-rupture is imperative as a second surgery has a lengthy healing and rehabilitation period (20). We suppose that including Tendoflex to the treatment might have a positive effect on preventing re-ruptures in this cohort.

Open repair via a conventional approach has been preferred in these patients other than minimal open procedures, which have high incidences sural nerve-related complications (9,10). The mini-open procedure is advocated to provide less soft tissue injury during the operation, which can decrease the rate of wound-related problems, which are frequently seen after Achilles tendon surgeries (21). None of our patients had any iatrogenic nerve injury, and meticulous closure of the skin prevented wound-related issues in this study.

Another major complaint of patients is pain, especially in walking, which prevents patients from participating in proper rehabilitation protocols causing worse functional outcomes (22). From the first follow-up visits to the last at the 48th week after the surgery, we have noticed a satisfactory range of motion of the ankle joint, which is supposedly provided by the significant early improvements in pain severity. We suppose that Tendoflex treatments provided a significant decrease in VAS scores (less pain) in a short period of time between 8th and 12th week follow up periods, contributing to the excellent functional outcomes at the last follow up visits.

Various recent studies advocated the inclusion of certain nutrients could promote tendinous healing. Vitamin C, phytochemicals, cyanidin, blueberries, Curcumin are just some of the nutrients that are advocated to promote tendon healing. Many in-vitro and in-vivo studies have been done for evaluating the effect of these nutrients in tendon healing (23). Tendoflex polytendon complex is the generic name of the drug, which contains 125mg methysulfomethane, 100mg L-arginine, 75mg bromelain, 50 mg Vitamin C, and 40 mg type 1 collagen for a single dose. Omeroglu et al. reported that high dose Vitamin C supplementation enhanced tendon healing in rats (17). Dar et al. reported that oral consumption of hydrolyzed type 1 collagen decreased inflammation (24). Enhancement of tendinous healing and inhibition of inflammation may have provided protection from re-ruptures. In this study, Tendoflex, as a dietary supplement, may have a contribution to the satisfactory outcomes of the patients.

The major limitation of this study was the lack of a comparison group and a relatively small number of patients. Prospective comparative studies should be done in the future to evaluate the effects of dietary supplements on Achilles tendon healing.

CONCLUSION

The open repair of Achilles tendon ruptures has certain advantages like lower re-rupture rates and lower iatrogenic neural injury rates. Including Tendoflex to the treatment protocol, may also have prevented re-ruptures and provided rapid amelioration of pain.

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Competing interests: The authors declare that they have no competing interest.

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Ethical approval: This study was approved by the ethics committee of Ataturk University Faculty of Medicine. Decision date: April 4, 2016; Decision number: 16

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