

Functional Outcome of Conservative Treatment of Isolated Anterior Talofibular Ligament Injury - A Prospective Analysis

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ABSTRACT

Introduction: Ligamentous injuries of the ankle are very commonly encountered in orthopaedic practice and 40% of these injuries constitute the Anterior Talo-Fibular ligament (ATFL) injuries. It is the weakest of the lateral ligaments. Unless there is significant joint instability, surgery is rarely indicated in the treatment of isolated ATFL injuries. Our study focused on the assessment of the long term outcome of isolated ATFL injuries treated by conservatively.

Material and Methods: We included 20 patients who presented to us with isolated ATFL injury from January 2015 to march 2015 for this prospective study. The diagnosis was confirmed with an MRI. 12(60%) patients were grade II and 8 (40%) patients were grade III. All the patients were conservatively treated with the POLICE protocol and weight-bearing was advised as tolerated but strictly with a proper ankle support. Patients were followed up at the end of 1st week, 2nd week, 1 month, 3rd month and at 6 months. Patients were evaluated with a Visual Analog Scale (VAS) and the Foot and Ankle Outcome score (FAOS).

Results: There was statistically significant improvement in the VAS and FAOS scores. From the pre-treatment scores of 9.1 and 53, they improved to 1.4 and 91 respectively at the final follow-up.

Conclusion: From our prospective study, we conclude that conservative management of isolated ATFL injuries is a safe and effective method of treatment.

Key words: Anterior Talo-Fibular Ligament (ATFL); Lateral ligament Injuries of ankle; Conservative: POLICE

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INTRODUCTION

Ligamentous injuries of the ankle are very common in the general population and are frequently encountered in the outpatient services of the orthopaedic department. They are very frequently encountered during athletic activities and common trivial injuries of the ankle, like twisting injuries of the ankle like a simple slip from stairs etc.¹ Almost 40% of all the athletic injuries are due to an inversion injury to the ankle.¹ When a plantar flexed foot is forcibly inverted, the commonly injured ligament is the anterior talo-fibular ligament (ATFL) followed by the calcaneal fibular ligament (CFL). Posterior talo-fibular ligament (PTFL) is very rarely injured unless there is a complete dislocation of the talus.^{2, 3}

Isolated anterior talo-fibular ligament injuries are commonly encountered in our practice. Almost 40% of the patients will have this type. They are the weakest of the lateral ligaments and they prevent anterior sublimation of talus when ankle is in plantar flexion.⁴ Ankle injuries are classified into three grade based on the severity of injury. Grade-I

being with no macroscopic tears, no joint instability, minimal symptoms. Grade-II being a partial tear, minimal instability of the joint, and moderate symptoms. Grade-III being a complete tear, patient not able to bear weight and significant joint instability.^{5,6} MRI is the preferred imaging study for assessment of ligamentous injuries of the ankle.

Unless there is significant joint instability, surgery is rarely indicated in the treatment of ligamentous injuries of the ankle. Isolated ATFL injuries rarely cause significant joint instability and hence are treated conservatively most of the times. Our study focused on the assessment of the long-term outcome of isolated ATFL injuries treated by the conservative protocol that we have followed.^{5,6}

MATERIAL AND METHODS

We included 20 patients who presented to us with isolated ATFL injury from January 2015 to march 2015 for this prospective study. Patients with a partial tear or a complete tear of the ATFL were included. The diagnosis was confirmed with an MRI, which was advised during the first visit. Patients who were above 18 years of age were included in the study. Patients who presented to us within one week of the injury only were included; patients who presented later than a week were excluded from the study. Patients with an open wound, associated CFL injury or PTFL injury or any other ligamentous injury of the ankle were not included in the study.

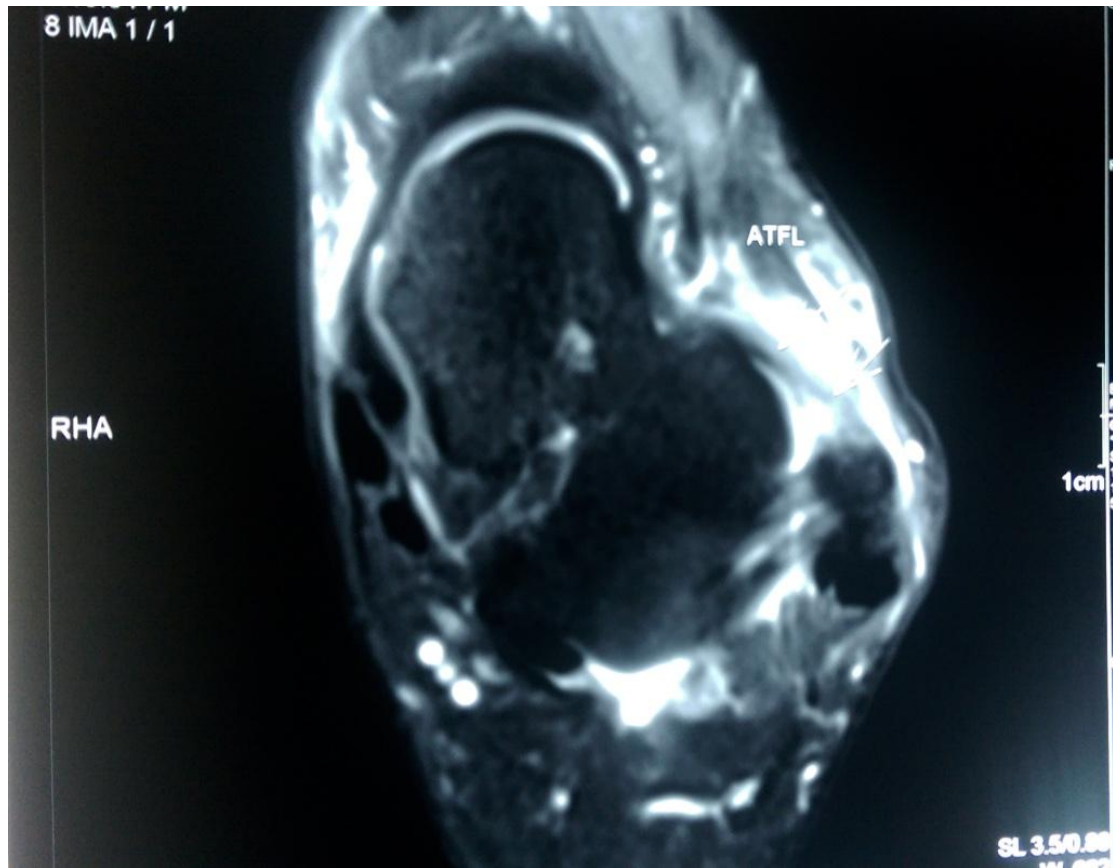


Fig. 1: MRI depicting a complete tear of the ATFL

There were 12 (60%) males and 8(40%) females in the study.14 (70%) patients were injured on the right ankle and 6(30%) patients on the left side. None of the patients had a bilateral injury. The mechanism of injury was sport-related in 10(50%) of the patients and trivial fall (fall from stairs, stepping on a hole) in 10(50%) of the patients. Mean age of the patients was 37 years (21-46 years). 11(55%) patients presented on the same day of injury and 5(30%) on the second day following injury, 2 (10%) on the 4th day and 2(10%) on the 5th day. There were no other associated fractures in any of the patients.

Anterior drawer test was performed in all the patients and was graded on a scale of one to three, one being no laxity and three being gross laxity.13 (65%) patients were graded as grade 1 and 7(35%) patients were graded as grade 2. 12(60%) patients were grade II and 8 (40%) patients were grade III. All the patients were initially treated with POLICE (protection, optimal loading, ice, compression and elevation)⁸ along with Non-steroidal anti-inflammatory drugs (NSAID'S) and trypsin-bromelain preparation to reduce the edema. Ice was administered at least 15 minutes for 3-4 times a day. Crepe compression was given to reduce the swelling. Patients were advised to elevate the limb at all times. Patients were advised rest till the acute symptoms

settled. Weight bearing was encouraged as tolerated. But, the patients were strictly encouraged to wear the air-stirrup ankle support, as advised at all times of weight bearing. The ankle support was continued for a minimum of three months following injury.

Patients were followed up at the end of 1st week, 2nd week, 1 month, 3rd month and final follow-up at the end of 6 months. Patients were evaluated with a Visual Analog Scale (VAS) and the Foot and Ankle Outcome score (FAOS). FAOS consists of 5 subscales; Pain, other Symptoms, Function in daily living (ADL), Function in sport and recreation (Sport/Rec), and foot and ankle-related Quality of Life (QOL). The last week is taken into consideration when answering the questionnaire. Standardized answer options are given (% Likert boxes) and each question gets a score from 0 to 4. A normalized score (100 indicating no symptoms and 0 indicating extreme symptoms) is calculated for each subscale. The result can be plotted as an outcome profile. It is a set of 52 questions.^{9, 10}

The present study was approved by the hospital ethics committee and has been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. All the study participants gave their informed consent before inclusion in the study.

RESULTS

The average VAS score was 9.1 (range: 7.2–9.6) at the beginning of treatment and the average FAOS score was 53 (range 41–64) points at the beginning of treatment.

The mean pre-treatment VAS score, which was 9.1, was a mean of 6.8 (range: 6.1–8.7) at 1st week follow-up, and a mean of 5.9 (range: 5.2–7.0) at 2nd week follow-up, a mean of 5.1 (range: 4.2–6.1) at 1 month follow-up, and a mean of 3.0 (range: 2.2–3.9) at the 3rd month follow-up and was 1.4 (range: 0.9–2.7) at the final follow-up of 6 months. There was statistically significant reduction in VAS score from the baseline score at 6-month follow-up ($P < 0.001$).

From the average pre-treatment score of 53, the FAOS score increased to a mean of 62 (range: 50–64) at 1st week follow-up, a mean of 64 at 2nd week follow-up (range: 56–66), a mean of 72 at 1st month follow-up (range: 62–78), and a mean of 79 (range: 73–84) at the third month follow-up and 91 (range: 86–93) at the final follow-up of 6 months. There was statistically significant improvement in the FAOS score from baseline at 6-month follow-up ($P < 0.001$).

DISCUSSION

Primary repair of acute lateral ligament tears is rarely indicated. Especially, in cases of isolated ATFL injuries, there is very rarely significant mechanical instability of the joint that warrant early surgical intervention. Open repair seems to offer no advantage over closed management at the time of the initial injury. Delayed repair may be necessary in patients with chronic mechanical instability on clinical examination and functional instability; however, surgical intervention in these cases should only be considered after an aggressive rehabilitation program has been unsuccessful.¹¹

Even in grade III ankle sprains, some studies have shown that early mobilization and rehabilitation may provide earlier functional recovery relative to surgery, and there is general agreement to try a 6-week period of conservative management, including early, controlled mobilization and rehabilitation before considering surgery. Also, no difference is found in long-term outcome when comparing early surgical repair with delayed surgical repair following failed conservative therapy. Therefore, there is no indication for routine early surgical repair.^{11,12}

In our prospective study, we found a good significant functional outcome with isolated ATFL

injuries with the management protocol we have followed for the conservative treatment. In this, we would like to highlight a few important points-- use of an ankle support is very important during mobilization following a ligamentous ankle injury and the quality of the ankle support seem to play a significant role in the final outcome. We have used an air-stirrup ankle brace, which is semi rigid, anatomically designed with outer shells which offer protection, comfort and the prevention of ankle roll over, inversion or eversion. Aircell system enhances the circulation and reduces swelling and the streamline fit should fit in shoes and allow early protected weight bearing, which seem to have had a positive impact in the final outcome. We have used air-stirrup braces belonging to three different manufacturers.

The early phase of rehabilitation is begun approximately 48 hours post injury. Icing is continued and range of motion exercises is initiated. Writing the alphabet with the great toe moves the ankle through full range of motion in all planes. Stationary biking and stretching of the Achilles tendon are also beneficial.

As strength and mobility improve, isometric exercises for ankle dorsiflexion, plantar flexion, inversion, and eversion are initiated. The isometric exercises are followed by resistance exercises (initially using a Thera-Band strap) and then heel and toe raises. Agility training also aids in returning the athlete to sports. Proprioceptive and balance training are also extremely important to help the patient heal fully, especially in jumping athletes. Proprioceptive training should be incorporated into all rehabilitation protocol.^{11,12}

Our results were comparable with a similar study by Samoto N et al.,¹³ who compared the conservative treatment of isolated ATFL and both ATFL and calcaneofibular ligament injuries in 2007 and concluded that the results of nonoperative treatment with 1 week immobilization followed by a functional brace were excellent in patients with an isolated injury of the anterior talofibular ligament, but were unsatisfactory in those with combined injuries of the anterior talofibular and calcaneofibular ligaments.

Hence, our prospective study has clearly shown that strict adherence to the devised protocol for the conservative management of isolated ATFL injuries gives a significantly positive functional outcome.



Fig. 2: Air-stirrup ankle support



Fig. 3: Air-stirrup ankle support

CONCLUSION

From our prospective study, we conclude that conservative management of isolated ATFL injuries is a safe and effective method of treatment.

CONFLICTS OF INTEREST AND FINANCIAL DISCLOSURE

This manuscript has not been published or presented elsewhere in part or in its entirety and is not under consideration by another journal. All authors have approved the manuscript and agree with submission to your esteemed journal. The authors affirm that there are no potential or existing conflicts of interest that would influence our interpretation of the data in this paper. There was no funding or grants for the study.

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