

## Research Article

# Non operative treatment of chronic ankle sprain: a study conducted in teaching general hospital, Telangana, India

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**Received:** 13 January 2015

**Accepted:** 8 February 2015

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## ABSTRACT

**Background:** Chronic ankle sprain due to “sprained ankle syndrome” may be particularly troublesome. Some causes of chronic ankle instability may be symptomatic insufficiency of pathologic laxity, arthro-kinematic changes, degenerative changes, decrease of proprioception and inadequate neuromuscular control. This study was conducted to review our experience with footwear correction of chronic ankle sprains of grade 2 and 3.

**Methods:** Ankles of 280 patients, who had chronic ankle sprains grade 2, grade 3 were considered in this study, to assess results of non-operate treatment. Diagnosis was made with history of pain, swelling on walking, clinical findings of swelling, tenderness on antero-lateral aspect of lateral malleolus. All patients were given 3 days of anti-inflammatories, analgesics and footwear modifications. Later patients were advised exercise program.

**Results:** Out of 280 patients, who were regularly followed, 92% people had relief, 3.4% of patients continued footwear as they had associated symptoms, 3.9% of patient continued to have pain maybe obscure or not following doctor orders.

**Conclusion:** The study concludes that lateral elevated foot wear made of micro cellular rubber of 0.75 cm is the choice of treatment for grade 2 and 3 ankle sprains. This foot wear helps in biomechanical correction from varus and also decreases symptoms and signs. Cosmetically acceptable.

**Keywords:** Sprained ankle syndrome, Footwear, Chronic ankle pain

## INTRODUCTION

Chronic ankle sprain is mostly due to anterolateral ligament sprain.<sup>1,2</sup> The frequency of complications and duration of long standing symptoms after ankle sprain has led to the suggestion of “sprained ankle syndrome”.<sup>3</sup> There is no simple thing as simple ankle sprain.<sup>4</sup> Anterior-talo-fibular ligament is almost always the first ligament or only ligament to rupture.<sup>2</sup> Chronic residual symptoms persist<sup>2</sup> if not treated adequately. After severe ankle sprain, persistent symptoms may be particularly

troublesome.<sup>5</sup> Persistent ankle pain which doesn't resolve even after six weeks of adequate conservative treatment has been termed as unresolved ankle sprain.<sup>6</sup> Chronic ankle instability is due to symptomatic insufficiency of pathologic laxity, arthro-kinematic changes, degenerative changes, decrease of proprioception and inadequate neuromuscular control.<sup>7</sup> In addition some degree of synovitis, variance stretching of peroneal muscles, irritation of nerve endings<sup>2</sup> would be other contributory causes. Relative tenderness is because of peroneal weakness.<sup>2</sup> Persistent minimal varus instability of talus in

ankle mortise painfully coincides with functional instability.<sup>8</sup> Residual symptoms after ankle sprain affect 55% to 72 % of patients at 6 weeks to 18 months.<sup>3,9</sup> Treatment ranges from rest to ligament reconstruction. Some physical symptoms are present without much obvious explanation<sup>10</sup> it is termed as “unresolved ankle sprain”.<sup>6</sup> The goal of non-operative treatment of chronic ankle sprain is to decrease arthrosis, pain, swelling and correcting biomechanics of ankle, using footwear corrections, anti-inflammatory drugs and muscle strengthening.

The purpose of retrospective clinical study was to review our experience with footwear correction of chronic ankle sprains of grade 2 and 3.

Study also focused on epidemiology, influence of various corresponding variance viz. age, grade, sex, side and duration of symptoms.

**METHODS**

The study was conducted at MNR medical college Sangareddy, India. 280 patients were diagnosed having chronic ankle sprain from Jan, 2011 - Feb, 2014. We requested general physicians surrounding to refer us untreated chronic ankle pains. Clinical signs of swelling over anterior lateral aspect by end of the day following injury from day one to 4 months were included in the study. Exclusion criteria being grade 1 and grade 4.

The study group comprised of 190 males, 90 female patients, with mean average age of 32 years. We divided patients into groups according to age. Group one: age less than 20 years (92 patients), group two: 21 to 40 years (146 patients), and third 41 to 60 years (42 patients).

Taking into consideration the duration of symptoms, we separated patients into 3 categories i.e., less than 6 weeks, from 6 weeks to 3 months, more than 3 months.

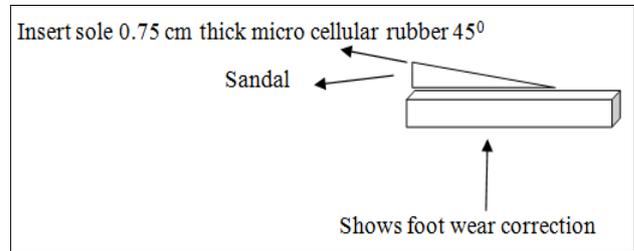
Patients’ history was elicited and they were examined clinically for signs, later with X-ray on stress AP view keeping the ankle in plantar flexion. Follow up was done every month until recovery.

**Treatment protocol**

All chronic lateral ankle pain patients with grade 2 and grade 3<sup>14</sup> sprains after x-ray in the stress view in plantar flexion of ankle<sup>15</sup> were advised footwear with lateral elevation, covering lateral half of foot wear, inclination of around 45<sup>0</sup> upto 0.75 cm thickness (as shown in the diagram) (Figure 1). They were custom made which worked out economically and cosmetically. Figure 2 shows foot wear correction.

Patients were advised to have two pairs of footwear, one household and other for workplace which they wore for 6 weeks to 12 weeks. 98% of patients recovered of pain.

Patients went to their regular activities with regular footwear once they recovered. Physio-rehabilitation was continued with (a) strengthening of peroneal muscles using resistance of wall or thearaband. Alleviates pain tenderness over lateral aspect of ankle, (b) walking on forefoot and walking on heel with toes flexed advised to condition foot and ankle.



**Figure 1: Show line diagram illustration of foot correction.**



**Figure 2: Shows foot wear correction.**

**RESULTS**

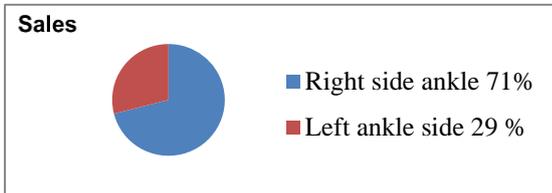
Our study shows 280 patients of 2 years follow up. 257 patients had complete relief. 92% of patients had complete recovery of pain and 3.4% continued wearing footwear they were associated with other symptoms, 3.9% patients were not satisfied may be, they were not following orders or reason being obscure still needs “more evaluation” (Table 1). The right ankle was more commonly involved (Table 2), (Figure 3). Majority were males compared to females, probably injuries in males related to level and type of activity (Figure 4). Most of them had twisting injuries. 4 patients came as late as 6 months, they recovered by 4 months.

**Table 1: Table shows results of outcome of foot correction in ankle sprains.**

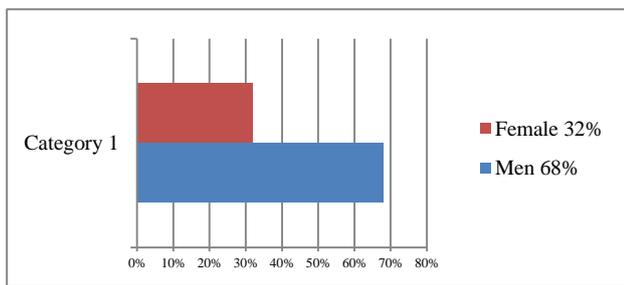
	Number of patients	Complete recovery	Partial recovery	Not recovered
Number of pts	280	257	10	11
% of patients	100%	92%	3.4%	3.9%

**Table 2: Number of patients and ratio of men to women having ankle sprains.**

	Total	Men	Women
Total No. of patients	280	190	90
Percentage of patients	100%	68%	32%



**Figure 3: Ratio of patients having right ankle to left ankle sprain.**



**Figure 4: Showing ratio of ankle sprains women to men (Gender ratio).**

**DISCUSSION**

Ankle injuries are common in sports but they are more frequent in leisure activities.<sup>11</sup> Our mean average age showed 32.7 years and right ankle being commonly involved as it is the dominant. These observations are similar to other articles<sup>4,11-13,15</sup> (Table 3). Ankle sprains were more common in young males (20-30 years) and older age females (30-40 years).<sup>10,11,15,16</sup>

Recalcitrant ankle sprains being more common the treatment of ankle sprain need to be given importance.

Mild Ankle sprains would recover completely with rest for 2-3 days, but moderate injuries with pain would not heal completely, causing pain and swelling. Instability of foot after injury to lateral ligament of ankle persistent minimal varus, instability of talus in ankle mortise was possible cause of functional instability.<sup>8</sup> Majority of the patients came with swelling and mild pain in antero-lateral aspect of the ankle. Pathophysiology of pain was incomplete healing of ligament, capsule and improper biomechanics of talo-calcaneal (mild subluxation),<sup>17</sup> this causes arthrosis later to peroneal muscle weakness.<sup>2</sup>

This displayed no radiological/clinical abnormality after injury but noted functional instability over year. Adhesions cause function and biomechanical instabilities.<sup>8</sup> This lateral wedge foot wear would correct biomechanical instability.

**Table 3: Showing comparative values of different authors' studies.**

Name author	Mean average age	Side	Sex	Recalcitrant	Max mode of injuries
Rileysbosein et al. <sup>10</sup>	28 years	Rt 79% Lt 21%	Male:female	47%	-
Eric elis <sup>17</sup>	22.7 years	Rt 66% Lt 33%	Male >female	-	Sports
Msyeumgphiletal <sup>18</sup>	28 years	Rt 75% Lt 25%	Male >female	75%	Leisure activities
Malcom Glasgow et al. <sup>19</sup>	30 years	-	Male >female	26%	Leisure activities
Ville Alanen et al. <sup>11</sup>	30 years	Rt = Lt	Men >female	-	Leisure activities
Our article	32.7 years	R = 71% Lt = 29%	Men >female	3.9%	Leisure activities

Subtalar ligament complex may also be injured and is difficult to distinguish contribution of these two joints.<sup>10</sup> stress tomography widely forced dorsi flexion and supination may help. Brodein view may show increased gap between the surfaces of posterior subtalar joint. Repetitive strain has also linked to increase of osteo arthritis and articular degeneration at ankle.<sup>20</sup> Static ligaments are restraints. Musculotendinous units which

allow for dynamic stabilization of joints, the functional aspect of each of these as it relates to ankle instability.<sup>7</sup>

Fuller<sup>21</sup> hypothesized that a foot with its centre of pressure medial to subtalar joint has greater supination movement from the vertical ground reaction force, with a more lateral relationship between the cop and joint axis. Thus increased supination cause excessive inversion and

supination internal rotation of the rare foot in closed chain lead to lateral ligament injury.

Inman<sup>21</sup> VT described more deviated subtalar joint axis would have greater pressure area over medial joint area tensile lateral surface area. So lateral elevation insert prevents same. So better ligament healing, preventing of ligaments and peroneal muscle lengthing thus prevent lateral deviation. peroneal muscles are active before initial foot contact.<sup>23</sup> It is likely to create stiffness in tendons before initial foot contact with ground.<sup>13,14</sup> This insert prevents further inversion injury and overlengthening of peroneal muscles. Some patients showed no laxity of ankles but appropriate radiological techniques should confirm that subtalar joint is site of pathology.<sup>2</sup>

A few patients displayed no clinical or radiological abnormality after injury but noted functional instability after over year.<sup>8</sup> Adhesions cause functional and biomechanical instabilities.<sup>6</sup> Atfl is approximate 45° from frontal plane.<sup>7</sup>

Our view thus foot wear wedge has 45° prevent adhesions and biomechanical arthrosis mimicking Atfl. Thus corrected foot wear prevents pain, helps in healing of ligaments and correct biomechanics.

## CONCLUSION

The study concludes that Lateral elevated foot wear made of micro cellular rubber of 0.75 cm is the choice of treatment for grade 2 and 3 ankle sprains. This foot wear helps in biomechanical correction from varus and also decreases symptoms and signs. Cosmetically acceptable.

## ACKNOWLEDGMENTS

We are thankful to Mr. Ramesh for alteration of sandals as per our specifications, Dr. Chandrashekar superintendent, for supporting my research.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

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DOI: 10.5455/2320-6012.ijrms20150320

**Cite this article as:** Mattam S, Panduranga Rao KR, Reddy CM. Non operative treatment of chronic ankle sprain: a study conducted in teaching general hospital, Telangana, India. Int J Res Med Sci 2015;3:635-9.