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Functional outcome of conservative management of acute soft tissue injury of ankle joint in adults

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Abstract
Acute ankle injuries are one the most common musculoskeletal injuries in emergency departments. However, there are still no standardized examination procedures or treatment. Therefore, the aim of this study was to develop standardised approach for the diagnosis and treatment of acute ankle injuries. All adult patients with acute ankle sprain without bony injury in OPD or emergency were included in the study and followed for the minimum period of 6 months. All the patients were clinically evaluated for swelling, haematoma discoloration, pain on palpation, the anterior drawer test and talar tilt test on each visit. Patients were treated with short period of protection using brace or below knee slab, followed by early weight-bearing, including exercises and neuromuscular training of the ankle. On follow up time to return to work and sports activity, restriction of ankle motion and recurrence of symptoms were noted. This study supports non-surgical treatment for majority of cases with short term immobilisation followed by functional treatment for grade 3 and early mobilisation for grade 1 and 2 ankle sprain.

Keywords: Ankle injury, ankle sprain, functional treatment

1. Introduction
Acute injuries of the ankle are among the most common injuries of the musculo-skeletal system [1]. It has been estimated that about one ankle sprain occurs per 10,000 people each day in Western countries [2-4]. In 77-99% X-rays are taken [5, 6] although in only 9-15% a fracture of the ankle or foot is present [6-8]. Consequently, soft tissue injuries are the most common and the majority of X-rays are not essential. Approximately 85% of sprained ankles involve the lateral ligament complex [9-11]. While it is widely agreed that a slight injury to the lateral ligament complex recovers quickly with non-operative management and have an excellent prognosis, [4, 12, 14] there is still controversy about the best treatment for severe ankle sprains. Diagnostic tools to verify the severity of the injury are inconsistent, some authors use stress radiography or arthroscopy or ultrasonography while others use clinical examination. Factors for assessing functional outcome after injury are time to return to work, recurrence rate, persistent pain, range of motion or subjective / functional instability. Since ankle injuries are common, and there are numerous residual symptoms after ankle sprains, it is crucial to institute a standardized approach for diagnosis and treatment, in order to provide the best treatment available. The two approaches to conservative treatment are: i) immobilization, usually using a cast, and ii) functional treatment, with a short period of protection using tape, a bandage, or a brace, followed by early weight-bearing, including exercises and neuromuscular training of the ankle [15]. When a diagnosis has been made, it is generally agreed that non-operative treatment with early functional rehabilitation is the treatment of choice [15]. A recent meta-analysis showed operative treatment to be superior to functional treatment [16]. Operative treatment is associated with increased risk of complications and is also associated with higher costs. Finally when conservative treatment fails, secondary operative reconstruction of the ligaments can be performed with similar good results, even years after the initial injury [17].

2. Material and Methods: All patients attended in emergency or OPD between August 2017 to December 2018 were included in the study with the following inclusion criteria.

2.1. Inclusion criteria

- An age of eighteen years or older,
- Acute injury to ankle

2.2 Exclusion criteria

- Bony injury to ankle on xray
- Previous history of surgery and trauma to same ankle joint
- Tumors or any other pathology involving same ankle joint

All patients presenting with clinical signs and symptoms of acute ankle injury were evaluated and recorded clinically and radiologically. The age, gender, duration and intensity of symptoms and mode of injury at the time of presentation were recorded. The patients were graded for their functional disability on the basis of the west point grading system (figure 1). Ankle joint AP and lateral radiograph was done in all the cases to rule out bony injury. Patients were evaluated clinically on presentation and after 5 day. The most important features of physical examination are swelling, haematoma discoloration, pain on palpation, the anterior drawer test and talar tilt test (Figure 2). Physical examination is unreliable in the acute situation because of the pain: the anterior drawer test cannot be adequately performed. Moreover there is diffuse pain on palpation and it is often difficult to judge whether the cause of the swelling is oedema or haematoma. A few days after the trauma, the swelling and pain have diminished and it becomes obvious whether the cause of the swelling was oedema or haematoma. The pain on palpation has become more localised and the anterior drawer test can be performed. All the patients were given below knee plaster slab and explained about limb elevation and ice application. Patients were restricted for weight bearing until second assessment and given oral analgesics. After second assessment on 5th day if swelling and pain are reduced, patients are encouraged for protected weight bearing and ankle range of motion. Patients were followed on 1, 3 and 6 month after injury for residual pain, swelling, time to return to work and sports activity, restriction of ankle motion and deformity of ankle.

West Point Sprain Grading System

	Tearing	Swelling	Joint Instability	Weight Bearing
Grade I	microscopic	minimal	none	fully / partial
Grade II	partial	moderate / severe	mild / moderate	unable
Grade III	complete rupture	severe	moderate / severe	unable

Fig 1: Ankle Sprain Grading (image courtesy medscape.com)

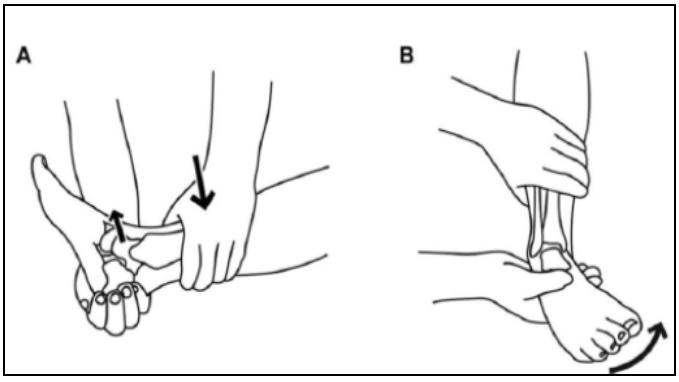

Fig 2: Clinical tests of the lateral ligament complex. (A) The anterior drawer test for the anterior talofibulare ligament (ATFL) is performed with the knee joint flexed. The ankle joint is held in 10-15° plantar flexion, and the clinician presses the heel forward while holding back the tibia. (B) The talar tilt test for the ATFL and calcaneofibular ligament (CFL) is carried out with the ankle in the neutral position. The heel is held stable while inverting the talus and calcaneus on the tibia. (image courtesy: H. Polzer *et al*., 2012)

3. Results

Total 150 patients (85 males and 65 females) in the age group of 18 to 76 yr, having acute ankle injury were included in the study. All the patients were followed for minimum period of 6 month. Results are as per table 1 and 2. Patients with grade 3 injury have worse outcome and took more days to return to work. Conservative treatment has excellent result in grade1 and 2 injury and require close observation for grade 3 patients.

Table 1: Number of Patients Injury Grade wise

Ankle sprain grade	Number of patient	Percentage (%)
1	62	41.33
2	55	36.66
3	33	22

Table 2: Functional outcome at 6 month follow up

	Grade 1	Grade 2	Grade 3
Return to work in days (mean)	8	14	31
Persistent pain (%) at 6 month	4.8	12.72	30.30
Restricted ROM at 6 month (%)	3.2	7.27	18.18
Clinical instability at 6 month (%)	0	3.6	24.24
Ankle sprain recurrence (%)	6.4	14.54	27.27

4. Discussion

In this study we have analyzed the data from a group of 150 patients followed for minimum 6 months duration with a diagnosis of acute ankle injury. Diagnostic tools to verify the severity of the injury are inconsistent, some authors use stress radiography or arthroscopy while others use clinical examination. We have used the westpoint sprain grading system to classify the patients clinically. A classification should allow reproducible and easy grading of the injury without elaborate techniques and also provide relevant information for treatment. Stable injuries of the lateral ligaments of the ankle should be treated using an elastic bandage and protection, rest, ice, compression and elevation (PRICE). Kerhoffs *et al.* compared conservative treatment with surgery in a meta-analysis and stated that the data available failed to show which treatment was superior [18, 19]. While surgery seemed better for objective stability, there were no differences in subjective instability, range of motion was reduced compared with conservative treatment, and no significant differences were observable in the other outcome measurements. Most trials reported a shorter time to return to normal activities after conservative treatment [15, 20, 21] High costs and the significantly higher rate of complications for surgery are also the drawbacks. Kannus *et al.* reported a shorter time to return to sport and work, and a better range of motion in early follow up for conservative treatment.[15] Beynnon *et al.* propose, that the use of an elastic bandage, combined with a semi-rigid ankle brace, could further reduce the time needed to return to sport/work [9]. A process evaluation showed that only 33 % of the patients in the study were fully adhered with the neuromuscular training program. Significantly fewer recurrent ankle sprains were found in the fully adherent group compared with the group that was not adherent. Cryotherapy has been proved to be effective in the treatment of soft tissue injuries [22]. It seems to reduce swelling and the need for pain killers, particularly when used soon after the injury, and it should, therefore, be part of the initial standard regimes [22]. Ogilvie-Harris *et al.* reviewed 18 RCTs, and concluded that the use of non-steroidal anti-inflammatory drugs (NSAID) leads to a significant reduction in pain at short-term follow up [22].

5. Conclusion

Majority of ankle ligament injuries can be managed without surgery. The indication for surgical repair should be always made on an individual basis. This study supports a non-surgical treatment of acute ankle sprains with a short-term immobilization for grade III injuries followed by functional treatment. Types I and II injuries might best be treated with a protection of the ankle with early functional treatment. Range of motion exercises should support functional rehabilitation after ankle sprain.

6. References

1. Bahr R, Bahr IA. Incidence of acute volleyball injuries: a prospective cohort study of injury mechanisms and risk factors. Scand J Med Sci Sports. 1997; 7:166-171
2. Babins EM. Lace-up ankle braces reduced acute ankle injuries in high school basketball players. Clin J Sport Med. 2012; 22(4):379-380
3. Balduini FC, Tetzlaff J. Historical perspectives on injuries of the ligaments of the ankle. Clin Sports Med 1982; 1:3-12
4. Best R, Brüggemann P, Petersen W, Rembitzki I, Ellermann A, Gösele-Koppenburg A *et al.* Aktuelle und neue Konzepte in der Behandlung akuter Außenbandverletzungn des Sprunggelenkes, Deutsche Zeitschrift für Sportmedizin Jahrgang. 2011; 62(3):57-62
5. Cooke MW, Marsh JL, Clark M, Nakash R, Jarvis RM, Hutton JL *et al.* CAST trial group Treatment of severe ankle sprain: a pragmatic randomised controlled trial comparing the clinical effectiveness and cost-effectiveness of three types of mechanical ankle support with tubular bandage. The CAST trial. Health Technol Assess. 2009; 13(13):iii, ix, x, 1-121
6. Chan KW, Ding BC, Mroczek KJ. Acute and chronic lateral ankle instability in the athlete. Bull NYU Hosp Jt Dis. 2011; 69(1):17-26
7. Dubin JC, Comeau D, McClelland RI, Dubin RA, Ferrel E. Lateral and syndesmotic ankle sprain injuries: a narrative literature review. J Chiropr Med. 2011; 10(3):204-219
8. Ekstrand J, Gillquist J. Soccer injuries and their mechanism: a prospective study. Med Sci Sports Ecerc. 1983; 15:367-370
9. Beynnon BD, Renström PA, Haugh L, Uh BS, Barker H. A prospective, randomized clinical investigation of the treatment of first-time ankle sprains. Am J Sports Med. 2006; 34(9):1401-1412
10. Engebretsen AH, Myklebust G, Holme I, Engebretsen L, Bahr R. Intrinsic risk factors for acute ankle injuries among male soccer players: a prospective cohort study. Scand J Med Sci Sports. 2010; 20(3):403-410
11. Fong DT, Chan YY, Mok KM, Yung PSh, Chan KM. Understanding acute ankle ligamentous sprain injury in sports. Sports Med Arthrosc Rehabil Ther Technol. 2009; 30(1):14
12. Lardenoye S, Theunissen E, Cleffken B, Brink PR, de Bie RA, Poeze M. The effect of taping versus semi-rigid bracing on patient outcome and satisfaction in ankle sprains: a prospective, randomized controlled trial. BMC Musculoskelet Disord. 2012; 28(13):81. doi:10.1186/1471-2474-13-81
13. Malliaropoulos N, Ntessalen M, Papacostas E, Longo UG, Maffulli N. Reinjury after acute lateral ankle sprains in elite track and field athletes. Am J Sports Med. 2009; 37(9):1755-1761
14. McGuine TA, Keene JS. The effect of a balance training program on the risk of ankle sprains in high school athletes. Am J Sports Med. 2006; 34(7):1103-1111
15. Kannus P, Renström P. Treatment for acute tears of the lateral ligaments of the ankle. J Bone Joint Surg [Am]. 1991; 73:305-12.
16. Pijnenburg ACM, Dijk van CN, Bossuyt PMM *et al.* Treatment for lateral ankle ligament ruptures: a meta-analysis. J Bone Joint Surg [Am]. 2000; 82:761-73.
17. Krips R, Van Dijk CN, Halasi T *et al.* Anatomical reconstruction versus tenodesis for the treatment of chronic anterolateral instability of the ankle joint; a 2–10 year follow-up. Knee Surg Sports Traumatol Arthrosc. 2000; 8:173–9.
18. Kerkhoffs GM, Handoll HH, de Bie R *et al.* Surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults. Cochrane Database Syst Rev. 2007; 2:CD000380.
19. Kerkhoffs GM, Handoll HH, de Bie R *et al.* Surgical versus conservative treatment for acute injuries of the lateral ligament complex of the ankle in adults. Cochrane Database Syst Rev. 2002; 3:CD000380.
20. Tiling T, Bonk A, Hoher J, Klein J. Acute injury to the

lateral ligament of the ankle joint in the athlete. Chirurg. 1994; 65:920- 33.
21. Shrier I. Treatment of lateral collateral ligament sprains of the ankle: a critical appraisal of the literature. Clin J Sport Med. 1995; 5:187-95.
22. Ogilvie-Harris DJ, Gilbart M. Treatment modalities for soft tissue injuries of the ankle: A critical review. Clin J Sport Med. 1995; 5:175-86.