



Relevance of *Marma* in the sports injuries in the current scenario

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ABSTRACT

Marmas as “vital point” in *Ayurveda* to which any direct or indirect injuries / trauma can prove fatal or may result in disability/ pain. The term sports injury may be define as any injury sustained due to sport, most commonly used for injuries that affect the musculo-skeletal system i.e., the muscles, bones, tendons, cartilage and associated tissue. Sports injuries are injuries that happen when playing sports or exercising, accidents and poor training practices or improper gear. Hence this study was planned to explore the importance of *Marma* in the sports injuries in the current scenario or era. *Gulpha marma* is an important anatomical and physiological area in the lower limb as per *Ayurveda*. Sports injuries happen in any joint or part of the body during sports activities shows same common symptoms like pain, swelling, spasm, fracture etc. With the help of x-rays, *Gulpha Marmabhighat lakshan* and symptoms produced during sports injuries is closely related to ankle joint.

KEYWORDS: *Gulpha Marma*, Sports injury, Radiological investigation, Management

INTRODUCTION

Acharya Sushruta described a total of 107 *Marmas* and considered *Marmas* as “vital point” in *Ayurveda* to which any direct or indirect injuries / trauma can prove fatal or may result in disability/ pain. Injury to any parts may lead to severe pain, disability, loss of function, loss of sensation (anaesthesia) and death in the individual.

Amongst these 107 *Marma*, *Gulpha Marma* grouped under *Rujakar Marma* situated on the junction of the *Jangha* and *Pada*¹, in both lower extremities. Any injury / trauma to *Gulpha Marma*, leads to feel as if full of thorns, even after healing there is shortening of the limb, lameness, decrease in strength, restriction of the movements, and atrophy of muscle and swelling of the joint in person².

A sports injury defined as any kind of injury, pain or physical damage that occurs due to result of sport, exercise or physical activity. Most of the cases, injuries are due to overuse of a part of body when participating in certain activity. The term sports injury may be define as any injury sustained due to sport, most commonly used for injuries that affect the musculo-skeletal system i.e., the muscles, bones, tendons, cartilage and associated tissue. The hinge joints are vital for movement and more vulnerable to injury, contains number of muscles, ligaments, tendons and bones. Hinge joint involved in so many outdoor sports which causes different types of injuries such as fracture, dislocation, sprains, strains, inflammation and wound. Sports injuries are injuries that happen when playing sports or exercising, accidents and poor training practices or improper gear. Improper warming up or stretching enough before play or exercise can also lead to injuries³.

Ayurveda is the ancient medical science which deals with physical as well as psychological health of the human being. In Ayurvedic classics vital force termed as Prana which emphasized in equivalence to the subtle life force energy for the existence of mankind. To understanding of the term Prana we must need to understanding different structures of the human body. The term *Atmas swaroopa* is coined for Prana due to its existence all over the body, but still its roots being embedded in precise location of human structure.

The point of union of five basic human structures that is *Mamsa*, *Sira*, *Snayu*, *Asthi* and *Sandhi* is one such unique location explained in classics where this vital life force energy is residing¹. In other words they can be defined as the complex anatomical sites, where a definite physiology rests and produce specific traumatic effects. These specific locations are explained as concept of *Marma Shareera* in ayurvedic samhitas. References of *Marma* are found since Vedic literature. *Valmiki Ramayana* and *Mahabharata* also described the *Marma*. In Ayurveda, *Marma* was first documented by *Acharya Charak*. The detailed description of *Marma Sharir* is available in *Samhitas*. *Acharya Sushruta* stated every aspect of *Marma* like definition, signs and symptoms of *Marma* injury. The total numbers of *Marma* as described in *Samhitas* are 107 in number. Twelve *Pranas*, the vital energy of the body, are the contents

of the Marma sthana. As Marma are vital points of the body they should be protected from any injury.

Acharya Sushruta believes that Marma Sharir covers the half knowledge of surgery. Any injury to these points may results into death and physician expert in Marma therapy, patient will cause some deformity. Marma are also sites of Tridosha and Triguna. Hence, these are specific areas of the body which is directly related to Pranik channels to internal organs. Acharya Sushruta explains the Marmaviddha Lakshanas in detail, for example- injury to Lohitaksha Marma, there will be death due to excessive bleeding. According to Maharshi Sushruta, there are four main types of Marma and they are as follows.

- According to Rachana (structures)
- According to Aghataj Parinaam (signs after trauma)
- According to Parimaan(anthropometric dimension)
- According to Shadanga Sharir(Region wise)

According to Rachana (structures)

Marma's are of five types- mamsa, sira, snayu, asthi and sandhi Marma. Sushutacharya further stated that these five elements are the only constitution of Marma and without these five elements Marma's are not exist. But apart from this Acharya Vagbhata added the sixth element in this above mention constitution; he stated that,we must add "Dhamani" in the constitution and stated that dominance of any one of these six elements decides the type of Marma (Tables 1-4) (Figure 1)

Table 1: Showing classification of Marma according to Rachana presents at the location.

Sr. No.	Name of Marma	Acharya Sushruta	Acharya Vagbhat
1	Mamsa Marma	11	10
2	Sira Marma	41	37
3	Snayu Marma	27	23
4	Asthi Marma	8	8

5	Sandhi Marma	20	20
6	Dhamani Marma	Not Explained	9

Table 2: Showing classification of Marma according to Parinaam (effect of injury) presents at the location.

Sr . No .	Name of the Marma	Sankh ya
1	Sadhya Pranhar Marma	19
2	Kalantar Pranhar Marma	33
3	Vishalyagn ya Marma	3
4	Vaikalyaka r Marma	44
5	Rujakar Marma	8

Table 3: Shows classification of Marma according to Shadanga Sharir.

Sr. No.	Part of Shadanga Sharir	Number of Marma
1	Dekshin Urdhva Shakha (Right Upper Extremity)	11
2	Vaam Urdhva Shakha (Left Upper Extremity)	11
3	Dekshin Adhah Shakh a(Right Lower Extremity)	11
4	Vaam Adhah Shakha (Left Lower Extremity)	11

	Lower Extremity)	
5	Madhya Sharir (trunk)	
	Urah(thorax)	9
	Udar(abdomen)	3
	Prushtha(back)	14
6	Shir/Shiro Griva (Head & Neck)	37

Table 4: Shows classification of Marma according to Parimaan(Anthropometric Dimension).

Sr. no.	Name of the Marma	Total number	Sushruta (19)	Ashtang Sangraha (20)	Ashtang Hrudaya (21)
1	Adhipati	1	½ angula	½ angula	½ angula
2	Aani	4	½ angula	½ angula	½ angula
3	Ansa	2	½ angula	½ angula	½ angula
4	Ansaphalak	2	½ angula	½ angula	½ angula
5	Apang	2	½ angula	½ angula	½ angula
6	Apstambha	2	½ angula	½ angula	½ angula
7	Aplap	2	½ angula	½ angula	½ angula
8	Aavart	2	½ angula	½ angula	½ angula
9	Bruhata	2	½ angula	½ angula	½ angula
10	Indrabasti	4	½ angula	½ angula	½ angula
11	Guda	1	Swa-Panital	Swa-panital	Swa-panital
12	Gulpha	2	2 angula	2 angula	2 angula
13	Hruday	1	Swa-panital	Swa-panital	Swa-panital
14	Janu	2	3 angula	04 angula	03 angula
15	Kashakdhara	2	01 angula	01 angula	01 angula
16	Katiktaran	2	½ angula	½ angula	½ angula
17	Krukatika	2	½ angula	½ angula	½ angula
18	Kshipra	4	½ angula	½ angula	½ angula
19	Kukundara	2	½ angula	½ angula	½ angula
20	Kurcha	4	Swa-panital	Swa-panital	Swa-panital

21	Kurchshira	4	01 angula	01 angula	01 angula
22	Kurpara	2	3 angula	04 angula	03 angula
23	Lohitaksha	4	½ angula	½ angula	½ angula
24	Manibandha	2	02 angula	02 angula	02 angula
25	Mannya	2	Swa-panital	Swa-panital	Swa-panital
26	Matruka	8	Swa-panital	Swa-panital	Swa-panital
27	Nabhi	1	Swa-panital	Swa-panital	Swa-panital
28	Nila	2	Swa-panital	Swa-panital	Swa-panital
29	Nitamba	2	½ angula	½ angula	½ angula
30	Parshwa-sandhi	2	½ angula	½ angula	½ angula
31	Phana	2	½ angula	½ angula	½ angula
32	Shankha	2	½ angula	½ angula	½ angula
33	Shringhatak	4	Swa-panital	Swa-panital	Swa-panital
34	Simant	5	Swa-panital	Swa-panital	Swa-panital
35	Stanmula	2	02 angula	02 angula	02 angula
36	Stanrohit	2	½ angula	½ angula	½ angula
37	Sthapani	1	½ angula	½ angula	½ angula
38	Talahruday	4	½ angula	½ angula	½ angula
39	Urvi	4	01 angula	01 angula	01 angula
40	Utkshepa	2	½ angula	½ angula	½ angula
41	Vasti	1	Swa-panital	Swa-panital	Swa-panital
42	Vidhur	2	½ angula	½ angula	½ angula
43	Vitap	2	01 angula	01 angula	01 angula

Hence, this study was planned to explore the importance of *Marma* in the sports injuries in the current scenario or era.

AIMS AND OBJECTIVES

To explore the importance of *Marma* in the sports injuries in the current scenario or era.

MATERIALS AND METHODS

All the relevant Ayurvedic texts, Literature of the contemporary science, as well as the data bases Google scholar, PubMed, Medline, AYUSH Research Portal, and Digital Helpline for Ayurveda Research Articles (DHARA), dissertation works from Ayurveda colleges, studies available on Research Gate web-based search engines, journal, related to *Marma* and sports injuries were searched and presented in systematic manner.

RESULT AND DISCUSSION

Ayurveda and Sports

According to *Ayurveda Samhita*, disease occurs due to two factors i.e., *Nija* (within the body) and *Agantuja* (external factors) in the body, likewise sports injuries are also occurs due to continues wear and tear or sudden impact. In *Samhita*, no any direct reference explained on sport injuries but with the help of classics, references on sport injuries under exogenous diseases (*Aagantuja rogas*) are caused due to the contact of external factors like fire, poisonous substances and also due to trauma explained. *Shusruta Samhita* included the category of diseases caused in a weak person due to fight with a stronger one (*Sanghaatabala-pravrta-vyadhi*) can be correlated with traumatic diseases such *Shoola* (pain), *Shopha* (swelling), *Vranashopha* (inflammatory swelling), *Vrana* (wound), *Kandbhagna* (fracture), *Sandhimukata* (dislocation), *Sanayugataavata* (ligament, tendon and nerve injuries) caused due to various games such as boxing, wrestling, martial arts etc. Acute injury such as fracture, dislocation, etc. are described in detailed in *Bhagna* Chapter.

Injury to the region of *Marma*, the person rolled on the bed due to severe pain, feel as though entering into emptiness, giddiness, restlessness and difficulty in breathing. Due to severe debility, cannot lift legs and hands, feels burning sensation in the heart and cannot stay for long time and soon die⁴. Injury to *Marma* leads to aggravation of all *Dosha Vata*, *Pitta* and *Kapha* and the occurrence of the disease symptoms depends on the location and the structures involved and can often cause a broken bone or torn ligament or tendon⁵. Among the *Marma*, *Gulpha Marma* are more prone or vulnerable to injury.

In *Astangha samgraha*, *Gulpha Marma* as the joint between *Pada* and *Jangha*. *Jangha* is the leg and the *Charana* indicate the foot. The meaning of word *Jangha* is leg between knee and the ankle. Regionally *Gulpha Marma* is a *Shaka Marma*, dimensionally 2 *Anguli Praman* and two in number. Based upon the anatomical classification, included in *Sandhi Marma*. Prognostically, *Gulpha Marma* grouped under *Rujakar Marma* in which *Agni*, *Soma* and *Vayu Mahabhuta* are predominant. The concept of *Rujakar Marma* is based on the patho-physiology

of the trauma and are eight in numbers⁶. Injury to *Rujakar Marma*, if not treated wisely and are managed by unskilled person then lead to one or the other form of deformity and end with morbidity, in turn to *Vaikalyakara* post traumatically with the passage of time.

Acharya Susruta explained *Vata* aggravates as a result of *Marmabighata* and produce severe pain⁷. *Dosha* stay in between *twak*, *mamsa* and *snayu* in *Sopha*⁸. On injury to bones, muscles, blood vessels and joints do not inflict the person so as the ligament⁹. Shortening and debility of body parts, pain and delayed wound healing are the consequences of injury to the *Snayu*¹⁰. The symptoms of *Gulpha Sanghat Abhighata* can be compared with that of fractures associated with ankle joint e.g., Pott's fracture, Maisonneuve's fracture.

Classification Sports Injury

Sports injuries can be broadly classified as either traumatic or overuse injuries, traumatic injuries account for most injuries in contact sports such as association football, rugby league, rugby union, Australian rules football, Gaelic football, American football because of the dynamic and high collision nature of these sports range from bruises and muscle strains, to fracture and head injuries. A muscle strain is the small tear of muscle fibres and ligaments sprain is a small tear of ligament tissue. The body response to these sports injuries is same in the initial five day period immediately following the traumatic incident – inflammation.

Signs and symptoms

Inflammation is characterized by pain, localized swelling, heat, redness and a loss of function.

Mechanism

All of the traumatic injuries cause damage to the cells. The dead and damaged cells release chemicals, which initiate an inflammatory response. Small blood vessels are damaged and opened up, producing bleeding within the tissue. The inflammatory stage is therefore the first phase of healing. However, too much of an inflammatory response in the early stage can mean that the healing process takes longer and return of activity is delayed. The sports injury treatments are intended to minimize the inflammatory phase of an injury, so that the overall healing process is accelerated. Ligament and capsular injuries at the ankle are usually referred to as a sprained ankle. The tendon injuries are less common as compare to ligaments are comparatively more vulnerable due to mobility.

ANKLE SPRAIN

Foot and ankle injuries comprise up to 25 percent of sports injuries. Out of this, eighty five percent of ankle injuries are sprains. There are pre-existing tendencies due to previous injury,

increased height and weight, and inherent joint laxity¹¹. In a basketball they comprise more than 50 percent of major injuries and in soccer and volley ball more than 25 percent. In addition, football players, gymnasts and team handball and field hockey players have a significant numbers of acute ankle injuries¹². Ankle sprain is most common in volleyball, broad jump due to improper jumping, cricket – uneven surface, tennis, badminton etc. A sprain is stretching and or tearing of ligaments (you sprain a ligament and strain a muscle). Ankle sprain are of two types- Inversion sprain and Eversion sprain.

Inversion sprain: The most common is an inversion sprain where the ankle turns over so the sole of the foot faces inwards, damaging the ligaments.

Eversion sprain: Excessive pronation – abduction, eversion and dorsiflexion are referred as a eversion sprain caused by pronation or eversion of the foot combined with internal rotation of tibia on the fixed foot¹³ (Fig.1).

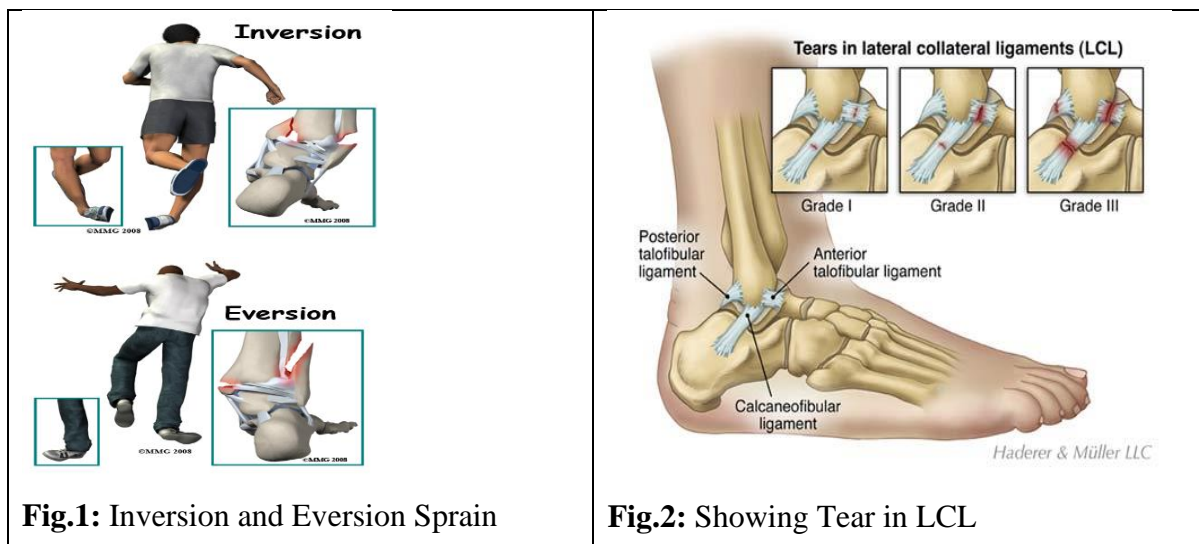


Fig.1: Inversion and Eversion Sprain

Fig.2: Showing Tear in LCL

Grades of Severity for Sprained Ankle

Sprained ankles, as with all ligament sprains, are divided in to grades 1-3 in Table 1(Fig.2).

	Grade 1	Grade 2	Grade 3
Definition	Few fibers of ligament are torn	Partial tear of ligament	Complete tear of ligament
Mechanism of injury	Overload and over stretch	Overload and over stretch	Overload and over stretch
Pain	Minimal	Moderate	Severe
Swelling	Minimal	Moderate	Severe

Loss of function	Minimal	Moderate	Severe
Bruising	Usually not present	Frequently present	Present
Difficult weight bearing	Absent	Usually present	Almost always present
Range of motion	Decreased	Decreased	May increase or decrease
Anterior drawer test	Absent	Present	Highly positive

Causes and risk factors

There are number of causes and risk factors associated with an ankle sprain. One of the most common causes is simply a lack of conditioning. If the muscles, tendons and ligaments around the ankle joint have not been trained or conditioned, this can lead to weakness that may result in ankle sprain. A lack of warming up and stretching is another major cause of ankle injuries. The article states that “basketball players who did not stretch during the warm up were 2.7 times more likely to injure their ankle than players who performs stretches.”

Ankle sprain symptoms

When an ankle is injured with a sprain, tissue injury and the resulting inflammation occur. Blood vessels become “leaky” and allow fluid to ooze in to the soft tissues surrounding the joint. Swelling because of increased fluid in the tissue is sometimes severe. Pain because the nerves are more sensitive. Redness and warmth caused by increased blood flow to the area.

Medial ligament injury: Injuries to medial ligament are much less common, as it is strong. Sudden eversion violence causes injury to the medial ligament.

Lateral ligament injury: The lateral ligament is damaged by excessive inversion accompanied by either plantar flexion or rotation. Supination of the foot in neutral flexion usually results in injury of the calcaneofibular ligament. Supination and adduction injuries tear both the anterior talofibular ligament and the calcaneofibular ligament.

FRACTURES

Most unstable ankle fractures are the result of excessive external rotation of the talus to the respect of tibia. The inversion force first strains the lateral ligament complex or avulses (transverse fractures) the lateral malleolus. Inversion ligament injuries of the ankle are the most commonly observed soft tissue trauma in sports. Posterior malleolus injury typically occurs

with supination – external rotation or a pronation – external rotation injury and represents avulsion of the posterior tibiofibular ligament from the posterior distal tibia¹⁴.

Fracture classification

Ankle fractures can be classified as single malleolar, bimalleolar, and trimalleolar if the posterior part of the tibial plafond is involved. The Danis-Weber classification for ankle fracture is simple and is most useful for primary care management. This classification system is based on the level of the fracture in relationship to the joint mortise of distal fibula.

- **Type A** fractures are horizontal avulsion fracture found below the mortise are stable and amenable to treatment with closed reduction and casting unless accompanied by a distant medial malleolus fracture.
- **Type B** fracture is a spiral fibular fracture that starts at the level of mortise occur secondary to external rotational forces, may be stable or unstable depending up on ligament injury or associated fractures on the medial side.
- **Type C** fracture is above the level of the mortise and disrupts the ligament attachment between the fibula and tibia distal to the fracture, are unstable and require open reduction and internal fixation.

Pott's fracture

A fracture affecting one or more of the malleoli (lateral, medial, posterior) is known as a Pott's fracture. It can be difficult to distinguish clinically between a fracture and moderate to severe ligament sprain. Both conditions may result from inversion injuries, with severe pain and varying degrees of swelling and disability.

SPECIFIC SPORTS INJURIES

Soccer injuries

In soccer running, jumping, tackling, kicking and heading are all involved therefore in soccer can result from direct blows or from indirect methods¹⁵.

Injuries to lower limb

Most of the injuries in soccer are seen in lower extremity. The most common fracture is probably due to a direct blow to lower part of tibia and fibula.

Injuries in track and field athletes

The injuries in field and track event may be contributed to lack of physical fitness, quality of surface, excessive training load, musculoskeletal deficiencies/deformities and in adequate footwear.

COMMON INJURIES IN RUNNING EVENTS

Achilles tendon rupture

Complete rupture of Achilles tendon can occur during violent contraction of the plantar flexors as in steep uphill running, during acceleration phase in a sprint start or diving off the long jump board. Partial rupture of Achilles tendon will cause a lack of thrust in running or jumping.

Stress fractures of tibia and fibula

If stress fractures are suspected early they could be prevented. If ignore it leads to a stress fracture. Pain develops gradually at the junction of the mid and lower third of tibia. Pain becomes continuous in later stages. Tenderness can be elicited over the muscles and over muscular attachment to the bone. Rest to two to four weeks is essential in treating stress fractures.

Injuries in racket sports

Tennis, badminton and squash all require frequent changes of direction in a confined place. It also involves abrupt deceleration and fast acceleration. Rupture of the medial belly of gastronemius can occur when the foot is exposed to violent dorsiflexion from plantar flexion while the knee joint is in extension. The frequent change of direction can cause stress on the ankle joint and exaggerated dorsiflexion can lead to rupture of Achilles tendon.

Ankle Impingement

Tissues in the ankle joint can become trapped between bones in the ankle known as impingement and occurs when the ankle is bent full up or down. Posterior impingement (as it is known) in the back of the ankle is more common in and ballet dancer and can be due to a bony protrusion at the back of ankle¹⁶.

Flexor Hallucis Longus Tendinopathy

The flexor hallucis longus muscle originates from the back to the fibula. It then travels along the inside of lower leg and ankle where it inserts into the base of big toe via the flexor hallucis longus tendon¹⁷.

Footballers Ankle

Footballer's ankle is pinching or impingement of the ligament or tendons of the ankle between bones, particularly the talus and tibia. This results in pain, inflammation and swelling¹⁸.

Peroneal Tendonitis

Peroneal tendonitis is an inflammatory condition of the peroneal tendon which run behind the ankle and under the foot. This condition is commonly seen in the runner as an overuse condition¹⁹.

Peroneal Tendon Dislocation

The peroneal are the two muscles and their tendons that attach along the outer edge of lower leg. Damage or injury to the structures that form and support the tunnel may lead to a condition in which the peroneal tendons snap out of the place known as the peroneal tendon dislocation²⁰.

Sinus Tarsi Syndrome

The sinus tarsi is a small osseous canal which runs into the ankle under the talus bone. Damage to the sinus tarsi can be cause from overuse in conjunction with over pronation or poor foot biomechanics. The sinus tarsi have a lot of synovial fluid/tissue which becomes inflamed. It may also occur with inflammatory condition such as gout or osteoarthritis²¹.

Tarsal Tunnel Syndrome

The tarsals are the long bones of the foot. Just below the bony bit on the inside of the ankle (medial malleolus) is a passage where to nerves run are called the medial and the lateral plantar nerves if over pronated than pressure is put on these nerves which can become inflamed causing tunnel²².

Inferior Tibiofibular Injury

The tibia and fibula are connected by strong connective tissue and ligaments. Inferior tibiofibular joint injury and can range from a small tear resulting in minimal pain, to a complete tear resulting in significant pain and disability²³.

ANKLE ASSESSMENT

The aim of assessing the ankle are to determine the degree of instability and grade of ligament damage and as well as to check for any other associated injuries such as fracture, avulsion fracture and tendon or nerve damage²⁴.

Palpation

The Physician will palpate, or feel, the ankle for specific painful areas, swelling in newer injuries and scar tissue in older injuries (Fig.3).

Ankle Range of Motion

The Physician ask the patient to actively move the ankle as far as they can into plantarflexion (pointing the foot away), dorsiflexion (pulling the foot up towards the knee), eversion (turning the sole outwards) and inversion (turning the sole inwards). The physician looks for decrease in movement compared to the uninjured side as well as pain or movements (Fig.4).

Resisted movements

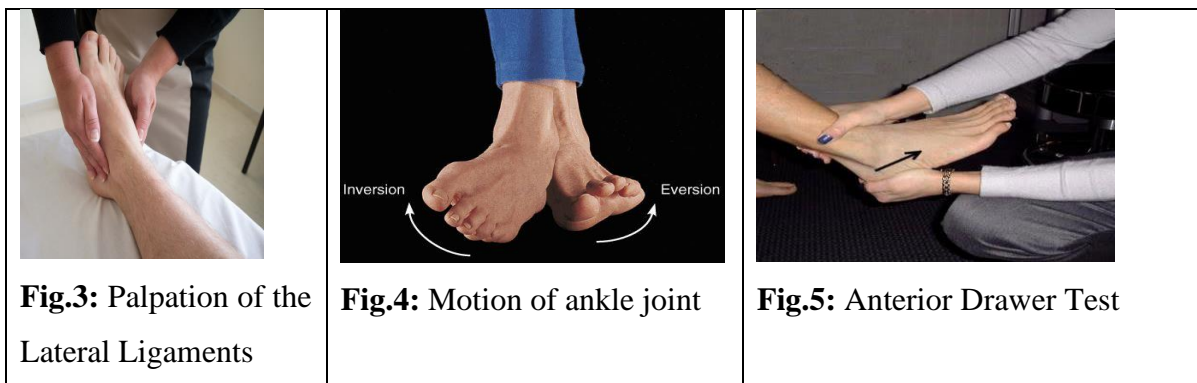
The Physician will apply resistance as the patient goes through the movements described above. Weakness compared to the other side and pains are noted.

Anterior Drawer test

The anterior Drawer test is used to assess ligament laxity through excessive anterior (forward) movements. Physician grasps the lower leg and the heel and applies an anterior (forward) force to the heel. Excessive movement compared to the non-injured side is a positive result (Fig.5).

Ottawa Ankle Rules

The Ottawa Ankle Rules have been developed to rule out fractures after acute ankle injuries. The Ottawa Ankle Rules consists of a questionnaire and research protocol for examination of ankle and foot. X-ray diagnostics is only indicated in case of Pain in the malleoli or middle foot.

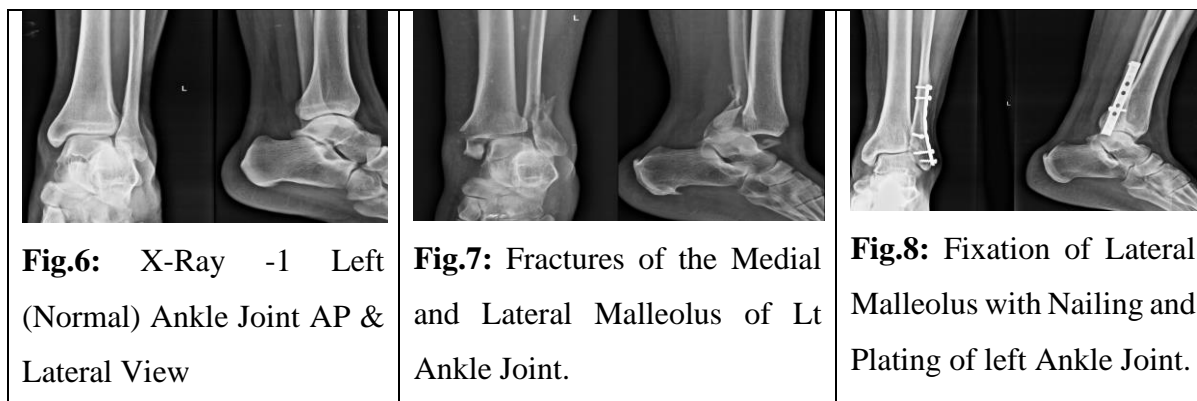


RADIOLOGICAL INVESTIGATIONS

A complete, standard radiograph examination of the ankle should include 3 views (AP, lateral and a mortise)

Computer Tomography and MRI

CT may be useful to detect small cortical fractures which are difficult to visualize on radiographs, and is more sensitive for mild syndesmotic injuries. MRI provides excellent soft tissue contrast and direct visualization of the syndesmotic ligaments (Fig.6,7).



MANAGEMENT

Usually surgery is not required in the vast majority of ankle sprains. Surgery may be needed in a patient who has cartilage damage or other concomitant injuries. Ligaments are only repaired or strengthened in cases of chronic instability in which the ligaments have healed but not in a strong fashion (Fig.8).

Early use of cryotherapy, continued with adhesive compression, is an effective treatment of ankle sprains yielding earlier complete recovery than late cryotherapy or heat therapy. Cold application causes reflex vasoconstriction of cutaneous vessels.

Treatment of Ankle Sprains

Successful treatment of ankle sprains depends on establishing an accurate diagnosis and ruling out associated injuries or separate conditions. For sprains, therapy can be divided into four phases. Each phase of treatment generally takes longer with more severe grades of injury, but the components of each phase are applicable for all grades of ankle sprain.

Phase 1

It's directed toward reducing swelling, protecting the injured ligaments, and beginning weight-bearing activity. Ice, compression, and elevation may be used to control swelling. The ankle can be protected in a figure-eight brace, tape, ankle corset, or cast boot, depending on the severity of injury.

Phase 2

It begins when the swelling has subsided and the patient is ambulating without discomfort. The goal of phase 2 is to restore ankle range of motion and build strength in the surrounding

muscles. Strengthening can be done with isometric exercises, manual resistance, or elastic tubing exercises.

Phase 3

Exercises commence when joint motion and strength are back to normal. The goal of phase 3 is to restore the proprioception that is predictably lost with ankle sprains. Proprioception can be measured by a modified Romberg test. Proprioception can be restored by use of a balance board or exercises such as playing catch or brushing teeth while balancing on one foot. Braces or tape may be helpful, in part because of their proprioceptive input.

Phase 4

It consists of functional progression from rehabilitation exercises to sport-specific skills. When all of the earlier phases have been completed, the patient may begin a return-to-running program that starts with jogging and progresses to running, sprinting, circles, figure eights, cutting, pivoting, and jumping. When all of these activities can be done without pain or limitation, the patient may be cleared to return to practice and, eventually, full participation.

ACUTE MANAGEMENT OF ANKLE SPRAIN

❖ PRICE Therapy

- **Protection:** If injured, stop playing and protect the injured part from further damage.
- **Rest:** Protect the injured muscle, tendon, ligament or other tissue from further injury and to promote effective healing.
- **Ice:** Provides short-term pain relief and also limits swelling by reducing blood flow to the injured area.
- **Compression:** Helps limit and reduce swelling, which may delay healing. An easy way to compress the area of the injury is to wrap a bandage around the swollen part.
- **Elevation:** Help control swelling, most effective when the injured area is raised above the level of the heart.

CONCLUSION

Gulpha marma is an important anatomical and physiological area in the lower limb as per *Ayurveda*. Sports injuries happen in any joint or part of the body during sports activities shows same common symptoms like pain, swelling, spasm, fracture etc. With the help of x-rays, *Gulpha Marmabhighat lakshan* and symptoms produced during sports injuries is closely related to ankle joint.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

ACKNOWLEDGEMENTS

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COMPETING INTEREST

Authors have declared that no competing interest exist.

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