

A CRITICAL AND CONCEPTUAL STUDY OF GULFA MARMS WSR TOABHIGHATAJ
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ABSTRACT

Ayurveda is an ancient health science devoted to the cure on human suffering and for the care of the health of the people. Ayurveda has classified the vital points in the body into 107 and named them *Marma*. according to Acharya Sushruta marma is constituted by confluence of Mansa (muscle), Sira (vessels), Snayu (nerves, tendons and ligaments), Asthi (bone) and Sandhi (joints). Acharya sushruta believes that Marma sharir covers half of the knowledge of surgery. The term marma means pran, jiva or life. Etymologically marma means *Marma* word is derived from the Sanskrita root MRU (Mritu), the *marma sthan* is a vulnerable point and is a seat of *prana or life*. These points are also known as vital points. According to Dalhan the vulnerable points are those points on the human body surface on which any kind of trauma or injury may lead to death or death like symptoms. *Acharya Sushruta* has described the anatomical classification of *Marma* and says that they are one hundred seven in number. According to him the five anatomical structures are basically and essentially involved when there is trauma or injury on *marma point*. The *Rujakar Marmas* are predominant in *Agni* and *Vayu guna*. They are specifically pain generating in their properties, therefore *ruja* (pain) is a predominant symptom after injury on *rujakar marma*. On the contrary one says that the pain is the result in all the *pancha Mahabhootas*.

According to *abhighataj lakshan Gulpha Marma* is *Rujakar Marma* marma and basis of *rachna prakar* it is *Sandhi Marma*, which is located at joint of ankle and foot with a measurement of 2 *Angula*. It is classified under the group of *Marma* which results pain when injured. The other symptoms are stiffness and limping. Anatomical correlation of *Gulpha Marma* is given to the ankle joint, the most frequently injured sites as it is located between the stable leg and mobile foot. The injury of ankle joint can be studied under three heads namely tendon, ligament and bones. The ligaments predominate in sports injury. This joint is one of the most frequently injured areas of this body since being the connecting link between stable leg bone and the mobile foot. This may be the specific point of observation by Sushrut. Ligamental and capsular injuries at the ankle are usually referred to as a sprain ankle. A ligament or a capsule supporting the fine and delicate nerve fibres are also stretched and lied to partial joint differentiation which may be permanent. The tendon injuries are less common as compare to ligaments, the tendons and ligaments around the *Gulpha* are comparability more vulnerable due to mobility.

KEYWORDS: *rujakar marma, gulpha marma, mahabhoota.***INTRODUCTION**

Vedic Samhitas, Brahmins and Upanishads reflect light on the concept of origin of life, birth, death and disease. The knowledge of Ayurveda inspired from *Veda such as Rigveda, Atharvaveda and Upanishads*. Marma is one of the important subjects of Ayurveda. Different school of thoughts analyzed this subject from different angles and development their own thought. In human body one hundred seven Marma are classified on the basis of structural, regional, dimensional and numerical classification. The knowledge of marma was depicted in Vedopanishads and purans.^[1] It is advised not to injure

these Marma points because on injury it may leads to deformity, pain or death as the vital energy (*prana*) is residing in the vicinity of these points. Hence it is said that the surgeon who is having the knowledge of marma can operate well without complication. In ayurveda role of Sushruta is most important, his description about Sharir is considered as best in all. Marma is unique concept of Ayurveda but the description present in Ayurvedic literature is based on the limited practical information present in old era. These ancient parameters cannot be applicable in today's modern scientific word. Therefore it is important to understand the concept of

Marma and prove it practically by showing its exact anatomical location and position on the body.

The development of science of *Marma* took place from *Saraswathi* culture to the time period of Charaka, Sushruta, Vagbhata. According to Sushruta, *Marma* point is an anatomical site where *Mamsa* (muscles), *Sira* (blood vessels), *Snayu* (tendons), *Asthi* (bones), *Sandhi* (joints) confluence.^[2] *Prana* is embodied at the site of *Marma*. There are 12 components of *Prana*. They are Agni, Soma, *Vayu*, *Satwa*, *Rajas*, *Tamas*, *Bhootatma* and Panchendriya. These are the basic factors to sustain life. So *Marma* is considered as “the vital points” in the body. Ayurveda enumerated 107 *Marmas* and classified it according to region (*Avayava Bhedena*), composition (*Asraya Bhedena*), dimension (*Pramana Bhedena*), prognosis (*Vyapath Bhedena*), and number (*Sankhya Bhedena*). Among them, *Gulpha Marma*, located at the lower extremities at joint, are two in number, measuring 2 *Angula* in length and causes agonizing pain when injured. The associated symptoms of stiffness and limping are also noted.

RUJAKARA MARMA

Ruja is sensation of pain felt by mind and body together in various Indian literatures. In *Atharva Veda* the word *Ruja* has been described in terms of its synonym *Shoola*. In *Atharva Veda* third kand the description of *shool* in the context of *karna shoola* and in ninth kand it is described in the treatment of *shirah shoola*. *Acharya Charak* has mentioned the term *Ruk*, *Ruja*, *Shoola*, *Vedna* etc in context of various disease.^[3]

The concept of *Rujakara Marma* is based on the pathophysiology of the trauma. If there is any trauma or injury at certain points which causes high grade pain are said to be *Rujakara Marma*. In simple terms *Rujakara Marma* are such sites in the body where in slight injury lead to severe pain though there is no much disturbance in its structural anatomy. Pain is the first sign of morbidity of any tissue. The number of *Rujakara Marma* is eight; - Two *Gulpha*, two *Manibandha*, four *Kurchshira*.⁴ In case of injury to this *Rujakara Marma* if not treated

Wisely and if they are managed by unskilled person then they will lead to one or the other form of deformity and end with morbidity. So these may turn into *Vaikalyakara* post traumatically in the passage of time. So it is very essential to know the anatomy of the *Rujakara Marmas* is successful line of management of trauma.

Gulpha marma

Derivation of word *Gulpha* is from the root word ‘*Gal*’ and ‘*Fuk*’ *pratyaya*. Etymologically the word ‘*Gulpha*’ has been derived from the Sanskrit root ‘*Gal*’ meaning Ankle. It is located between *Paada* and *Jangha* with 2 *Angula* in length. It is classified under *Rujakara Marma* as the consequences of its injury are *Ruja*, *Sthabdatha* and *Khanjatha*. *Gulpha Marma* is anatomically located

at *Gulpha sandhi*. *Gulpha* is structurally a *Kora Sandhi*. It is located in both lower extremities. Main functions are weight bearing and locomotion. Functionally it is a *Bahuchala Sandhi* and is correlated to ankle joint between stable leg and mobile foot, which is a modified hinge joint. The unique design of ankle joint makes it a very stable joint. The ankle- foot complex has a number of distinct features to optimize its role in weight bearing. The complementing structures of the foot allow it to sustain large weight bearing stresses under a variety of surfaces and activities that maximize stability and mobility. It is one of the most frequently injured sites as it is subjected to great variety of forces like standing, walking, running etc. Abnormal and excessive force will bring injury to the joint such as.

In modern literature the Ankle or talocrural region, is the region where the foot and the leg meet. The Ankle includes three joints: *Ankle joints (Talocrural joint)*, *Subtalar joint* and *Inferior tibiofibular joint*.^[5] The movements produced at these joints are dorsiflexion and plantar flexion of the foot. In medical terminology ‘Ankle’ can refer to the region or specifically to the talocrural joint. The main bone of the ankle region is Talus, Tibia and Fibula. The talus is also called the ankle bone. The talocrural joint is a synovial hinge joint that connects the distal ends of the tibia and fibula in the lower limb with the proximal

End of the talus. The articulation between the Tibia and the talus bears more weight than that between the smaller fibula and talus. After comparing the Ayurvedic and modern view & performing the dissection we concluded that the exact location of *Gulpha Marma* is nothing but the joint between tibia, fibula and talus and other structures related to lateral aspect of Ankle joint. Study of *Gulpha Marma* shows 5 compositions as is correlated as^[6]: -

1. **MAMSA**- Peroneus longus, Peroneus brevis, Superior peroneal retinaculum.
2. **SIRA**- Perforating branch of fibular artery and fibular nerve.
3. **SNAYU**- Lateral ligament of the ankle which consists of three separate ligaments- Anterior talofibular ligament, calcaneofibular ligament, Posterior talofibular ligament.
4. **ASTHI**- Tibia, lateral malleolus of fibula and talus.
5. **SANDHI**- Joint between tibia, fibula and talus.

Objectives of the Study - To study *Gulpha Marma* from Ayurveda and modern aspect and to evaluate structural and functional changes in *Gulpha Marma* injuries.

Material and methods - Books, literature, journals including those published on the concept related to the subject related to ankle joint, and study of *Gulpha Marma* and *Gulpha Sandhi* was done from Ayurvedic texts and contemporary.

Gulpha Sandhi

Gulpha sandhi (ankle joint) is the sandhi of the lower limb. *Gulpha Sandhi* is one of the important Sandhi of the lower extremities. It is mainly associated with locomotion and is a weight bearing joint. Structurally it is classified under *Kora Sandhi* and functionally it is *Bahuchala Sandhi*. Sushruta has explained that *Gulpha Sandhi* is present between or at the union of Paada and Jangha.

The fibrous capsule surrounds the joint and is attached all around the articular margins with two exceptions, posterosuperiorly inferior transverse tibiofibular ligament. Anteroinferiorly it is attached to dorsum of the neck of the talus at some distance from trochlear surface. Deltoid or medial and Lateral ligaments are also stabilizes the joint.

Gulfa Asthisanghat

The articulation of two or more bones forms joints such joint region is known as asthisanghat. There are fourteen asthisanghat are mentioned in Sushrut samhita Shari rsthana in 5th adhyaya and 16th citation, in that one asthisanghat is present in gulphapradesha (ankle region).

Gulpha Jaala

The jaala is plexus or network like arrangement of sira, snayu, mansa and asthi in one particular region of the body. There are sixteen jaalas are present in the body i.e. four Each in manibandha (wrist region) and gulpha pradesha (ankle region).

Gulpha Sirajaala

Around the ankle joint, mainly there arteries like anterior and posterior tibial and peroneal arteries are present, ankle joint is supplied by these three arteries.

Veins mainly dorsal venous arch on the dorsal aspect of the foot. From which laterally short saphanous vein and medially great saphanous vein mainly constitutes the venous drainage.

Gulpha Mansajaala

Muscular arrangement in ankle region is as, Anteriorly – Tibialis anterior, Extensor hallucis longus, Extensor digitorum longus and Peroneus tertius. Laterally – Peroneus longus and Peroneus brevis. Posteriorly – Gastrocnemius, Soleus, Plantaris, Popliteus, Tibialis Posterior, Flexor hallucis longus and Flexor digitorum longus.

Gulpha Snayujaala

Ligaments of ankle joint are as, The fibrous capsule, Deltoid or medial ligament and Lateral ligament.

Asthijaala

The bones related to the ankle region are as, Lower end of the tibia including medial malleolus, lateral malleolus of the fibula and also upper, medial and lateral aspects of the talus.

Marmaghat lakshan

the *Gulfa marma* described in *Ayurveda classics* at the junction of foot and leg, and trauma in this area causes pain restriction of movements or limping. Dalhan has specifically documented the measurement of this area of two fingers.

DISCUSSION**Concept of marma in classical texts**

The term Marma means *Prana, Jiva or life*. Marma are involved basically and essentially five anatomical structures: - i.e. *Mansa, Sira, Snayu, Asthi, Sandhi*. All major Ayurvedic texts refer to the total number of primary Marma as 107, while the total number of primary Marma regions is 51. The difference between these two numbers is because several Marma exist on both sides of the body, and some Marmas contain more than one Marma point. The difference between these two numbers is because several Marma exist on both sides of the body, and some Marmas contain more than one Marma point. However, many Ayurvedic teachers recognize more Marmas than these classical 107. In fact, every point on the body is potentially a Marma point because the entire skin or surface of the body is itself a Marma or sensitive region. One could say that the skin itself is the 108th Marma, linking all the other Marmas together. As Vata and Prana are held in the joints, each joint can also be viewed as a potential Marma region. Our internal organs have additional Marma points, either directly connected to them or connected by reflex points that can affect them from a distance. On top of such universally shared Marma points, each person will have his or her own unique sensitive points depending upon weight, frame, posture, diet, behaviour and age. Therefore, we shouldnot look at Marmas in a rigid way, though the classical 107 Marmas are a good foundation to start with. The same principles of Marma therapy can be applied to the extra Marmas as well.

Discussion about Gulfa Marma

Different Ayurvedic texts and modern anatomy text books are critically reviewed for the study of *Gulpha Marma*. The old references on *Marma* were procured from *Rigveda, Yajurveda, Ramayana, and Mahabharata*. The Ayurvedic classics explain the site of *Gulpha Marma* is where the *Paada* and *Jangha* meet together or the part of body where the foot is connected with the leg.

Gulpha (Ankle) is the important region in our body as it is the site of marma, sandhi, asthisanghat and jaala. Many important structures are present anteriorly, posteriorly, laterally and around the ankle, i.e. in the form of bones, ligaments, arteries, veins, nerves, muscles etc. So, gulpha pradesha is one of the major sites to the various injuries in the lower extremity. As per Dr. Ghanekar, Gulfa is the ankle joint which includes tibiofibular and talocrural articulation. In medical terminology, "ankle" can refer broadly to the region or specifically to the talocrural joint. The main bones of the ankle region are the Talus (in the foot), and the Tibia and

Fibula (in the leg). Among the 12 components of *Prana*, there is a predominance of Agni and *Vayu* in *Gulpha Marma*. Any trauma to the site causes excruciating pain as *Vayu* is the basic humor which causes pain in the body. *Gulpha Marma* is a *Sandhi* predominant *Marma*, or one which is located over a joint. But other structures are also (*Mamsa*, *Sira*, *Snayu* and *Asthi*) involved in the *Marma*. All these structure may be collectively present at the site, completely or partially. Compositions of *Gulpha Marma* are correlated with that of ankle joint as:

MAMSA- Peroneus longus, Peroneus brevis, superior fibular retinaculum.

SIRA- Perforating branch of Fibular Artery, Fibular nerve

SNAYU- Lateral ligament of the ankle which consists of three separate ligaments

1. Anterior talofibular ligament, a flat weak band
2. Calcaneofibular ligament
3. Posterior talofibular ligament.

ASTHI – Tibia, Lateral malleolus of Fibula and Talus.

SANDHI - Joint between Tibia, Fibula and Talus.

Anguli praman of Marma is 2 *Angula* which means that area where there is maximum chance of injury to the *Gulpha Marma*. And in ankle region maximum chances of injury is at the lateral side because of weaker lateral collateral ligament. *Ruja* is the aches and pains felt both physically and psychologically as a result of trauma. It is the first signal of any injury which provokes non receptive pain response. *Sthabda paadatha* is *Kriyahani* or functional disability. Any injury to ankle causing inflammation, nerve tissue damage etc can end up in this clinical condition. Ankle injuries which damage the tendons of the muscles such as flexor hallucis longus etc, lateral ligament and produce lameness or *Khanjata*. The elements of ankle joint namely tendon, ligament and bones have together role in maintaining the stability and integrity of the joint. Any trauma to these will cause biomechanical dysfunction of the joint resulting *Ruja*, *Sthabda paadatha* and *Khanjatha*.

The injury of ankle joint can be studied under three heads namely tendon, ligament and bones. The ligaments predominate in sports injury. This joint is one of the most frequently injured areas of this body since being the connecting link between stable leg bone and the mobile foot.

Discussion about Marmaghat Lakshan

Frequent site of injury. A large variety of bending and twisting forces result in a number of fracture and fracture dislocation.

Anatomy of Ankle joint (Talocrural joint)^[7]
ankle is actually made up of two joints.

Subtalar joint

1. It consist of a talus on the top and Calcaneous on the bottom.

2. the subtalar joints allows side to side to side motion of the foot.

True ankle joint – composed of three bones –

1. The Tibia – which forms the inside or medial portion of the ankle.
2. The Fibula – This forms the lateral or outside portion of the Ankle.
3. The Talus underneath.
4. The true Ankle joint is responsible for up and down motion of the foot.

Articular Surface – upper articular surface – formed by

1. The lower end of Tibia including medial malleolus.
2. The lateral malleolus of Fibula.
3. The inferior transverse tibiofibular ligament.

Inferior Articular Surface is formed by –

1. Upper aspect of Talus.
2. Lateral aspect of Talus.
3. Medial aspect of Talus.

Superior articular surface is formed by –

1. The downward projection of medial and lateral Malleoli, on the corresponding sides of Talus.
2. The inferior transverse tibiofibular ligament.

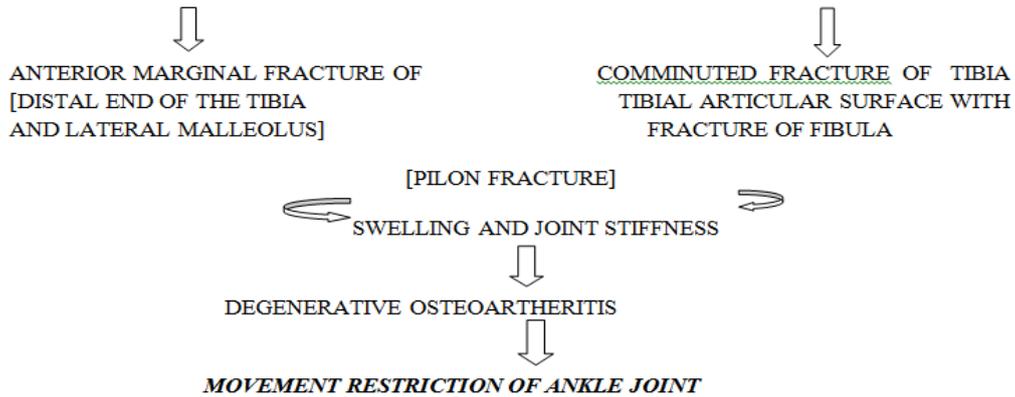
Ligaments – Medial ligament or deltoid ligament

1. Posterior Tibiotalar ligament
2. Anterior Tibiotalar ligament
3. Tibiocalcaneous ligament
4. Tibionavicular ligament.

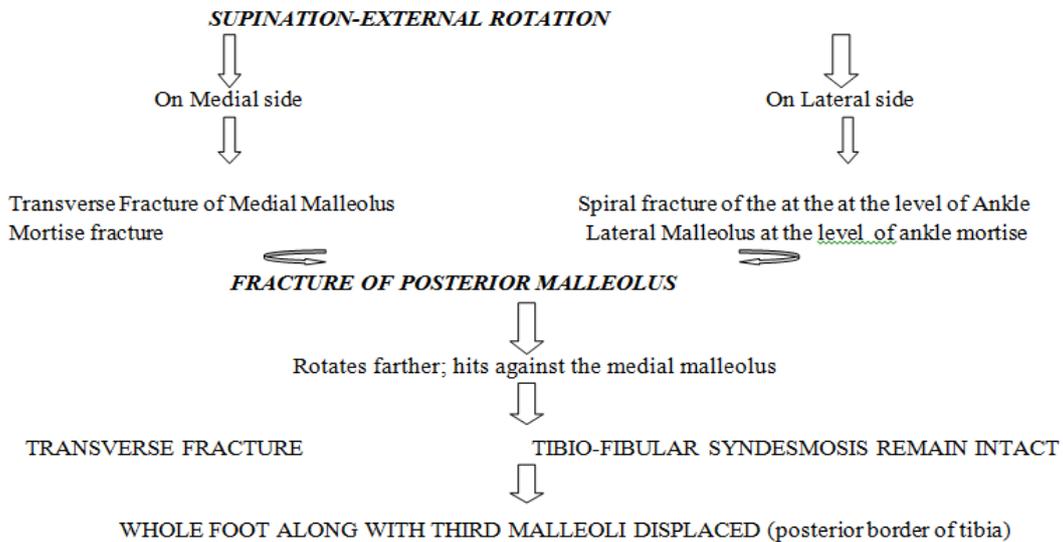
Lateral ligament

1. Anterior Tibiofibular ligament
2. Calcaneofibular ligament.

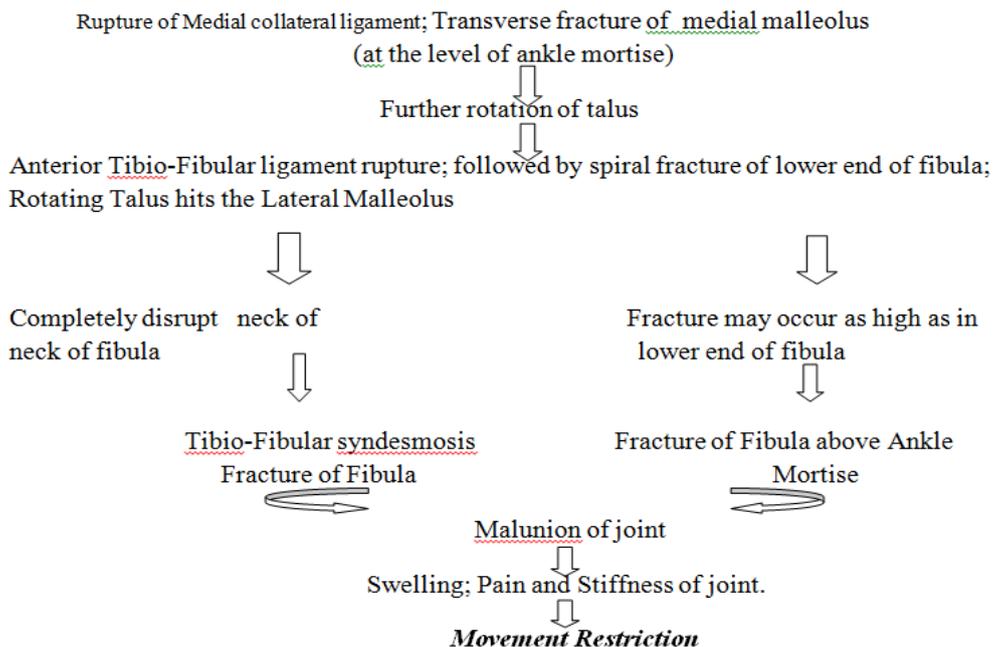
POSTERIOR TALOFIBULAR LIGAMENT.
1. VERTICAL COMPRESSION INJURY.^[8]



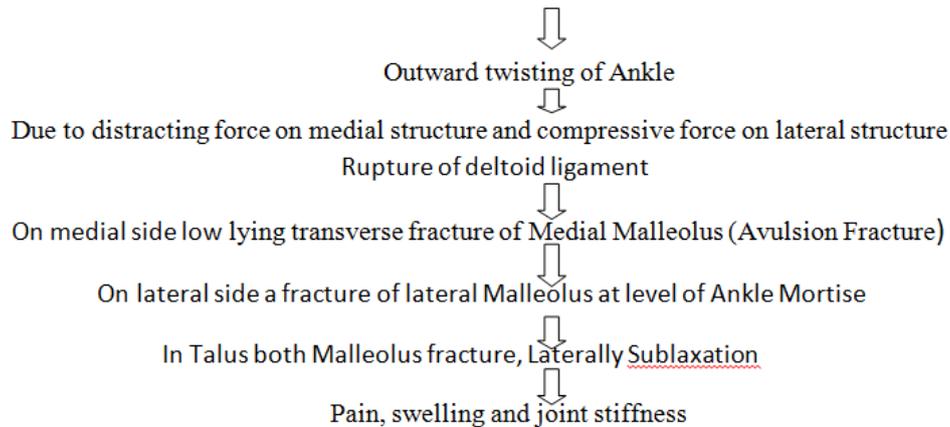
2. SUPINATED FOOT; THE TALAS TWISTS EXTERNALLY WITHIN MORTISE



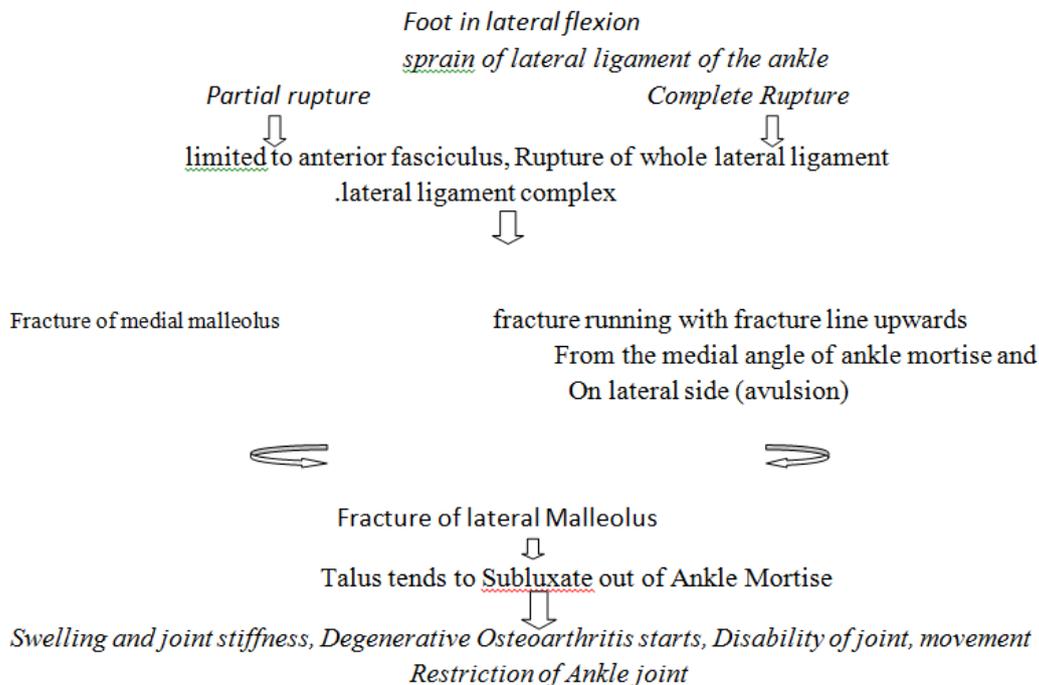
3. Pronated foot rotates externally also rotates outwards along it's vertical axis; Pronation external rotation injuries



4. ABDUCTION INJURY



ADDUCTION INJURY [INVERSION]



CONCLUSION

Acharya Dalhan has defined the Marma as “Maryanti it Marmani” i.e., it is the spot on the body surface where if any injury or trauma occurs, causes sudden death. So these points should be protected from any type of injury. Arundatta says that these are the vital points on which injury lead to Marana or Maranasagrishya Dukh (death) and Marma is the seat of Prana (life) which is constituted by confluence of Mansa (muscle), Sira (vein), Snayu (ligament), Asthi (bone) & Sandhi (joint).⁹ Vagbhata says that these are the points which are painful on the application of pressure & shows abnormal pulsation. Total numbers of Marmas described in Samhitas are 107. Samhita is being classified into 5 types on the basis of structural involvement in it⁵. Although each and every one of the elements which comprise the Marma as Mansa (muscles), Sira (arteries, veins, and

nerves), Snayu (fibrous covering and ligaments), Asthi (bones) and Sandhi (joints) are present in the site of Marma but on the basis of predominance of any above elements Marma are categorised.^[10] According to abhigataj lakshan Gulpha Marma is Rujakar Marma marma and basis of rachna prakar it is Sandhi Marma, which is located at joint of ankle and foot with a measurement of 2 Angula. It is classified under the group of Marma which results pain when injured. The other symptoms are stiffness and limping. Anatomical correlation of Gulpha Marma is given to the ankle joint, the most frequently injured sites as it is located between the stable leg and mobile foot. According to Acharya Sushruta Gulpha Marma is Sandhi Marma, Sandhi means where two bones are meeting together. Location of gulpha marma is Ankle Joint, where distal articular surface of the Tibia and Fibula; medial collateral ligament (deltoid ligament) and lateral collateral

ligament meet and form ankle joint. So the lesion is sandhi marma proved. Gulpha marmaghat parinam is *ruja*; movement restriction of joint, stiffness and limping; because of Gulfa Marma is Rujakar Marma, Where severe pain present. Due to trauma in this lesion rupture of medial collateral ligament and lateral collateral ligament; fracture-dislocation of malleoli seen; Due to rupture of tibio-fibular ligament pain; swelling and stiffness of joint present. In 80 percent of cases fracture of distal articular surface of tibia and fibula; spiral fracture of lower end of fibula; malunion of joint/degenerative osteoarthritis seen; because of malunion of joint\degenerative osteoarthritis swelling; pain and stiffness of joint seen. Then restriction of joint movement and lameness present.^[11] so according to Acharya Sushruta Gulpha Marmaghat parinam pain swelling; stiffness of joint and lameness of leg proved. In every fracture or fracture-dislocation of tibio-fibular joint pain; swelling and stiffness of joint present.

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