

An Anatomical and Functional Study of *Gulpha Marma* as *Rujakara Marma*

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Abstract— *Gulpha Marma*, located at the ankle joint, is recognized in *Ayurveda* as a *Rujakara Marma*. This classification indicates that it causes intense pain when injured, but it is not life-threatening. This study looks at its anatomical features and functional significance by comparing *Ayurvedic* descriptions with modern anatomy. Bones, ligaments, muscles, and nerves all converge at this *marma*, making it important for movement and sensitive to nerve activity. The intense pain following an injury arises from dense nerve connections and the joint's range of motion. Understanding *Gulpha Marma* improves diagnostic and treatment approaches in *Ayurveda*, particularly in *marma* therapy and for musculoskeletal issues related to the ankle.

fall into five structural types: *Mamsa* (muscle), *Sira* (vessel), *Snayu* (ligament/tendon), *Asthi* (bone), and *Sandhi* (joint). Based on the effects of injury, they are classified as *Sadya Pranahara* (instant death), *Kalantara Pranahara* (delayed death), *Vishalyaghna* (death after removing a foreign body), *Vaikalyakara* (causing deformity), and *Rujakara* (causing pain). This classification highlights their clinical importance.

Rujakara Marma is one classification based on outcomes and includes eight types. Four are located in *Bahu* in the upper limb, such as *Manibandha* (2) and *Kurchashira* (2). The other four are found in *Sakthi* in the lower limb, including *Gulpha* (2) and *Kurchashira* (2). An injury to this *marma* causes pain (*vedana*) and swelling (*shopha*) in the affected area. *Gulpha marma* is situated at the joint of the foot (*pada*) and leg (*jangha*). An injury in this area can lead to pain (*vedana*), stiffness (*stabdhapadata*), or limping (*khanjata*). The *Manibandha marma*, found at the *manibandha sandhi*, results in *kunthata*, or restricted movements, when injured^{3,4,5,6}. This research aims to understand why *Gulpha Marma* is classified as a *Rujakara Marma* in traditional *Ayurvedic* sources. Although it is a small and peripheral structure, an injury to *Gulpha Marma* leads to intense pain, showing its deeper physiological and energetic importance. This study seeks to connect traditional *Ayurvedic* ideas with modern anatomy. Emphasizing the clinical, surgical, and therapeutic significance of *Gulpha Marma* can improve emergency care and trauma treatment while raising awareness of these essential health points.

I. INTRODUCTION

Marma is a key concept in *Ayurveda* that refers to vital areas in the body crucial for life and health. *Marmas* are specific anatomical sites where different tissues come together. Injuries to these points can lead to serious issues, including death¹. There are 107 recognized *Marmas*, classified by their structure, location, and the effects of trauma². The idea of *Marma* comes from ancient *Ayurvedic* texts, especially the *Sushruta Samhita*. *Marma* points are important spots in the body where muscles, blood vessels, ligaments, bones, and joints meet. They act as centers of *prana*, or life force. These points are very sensitive, and any damage can cause pain, dysfunction, or even death. Understanding *Marma* is essential in surgery, diagnosis, and treatment. It also plays a key role in martial arts and healing practices like *Marma Chikitsa*, which stresses the need to protect these energy points.

Marmas are grouped by their location, structure, and the effects of injury into five regions: *Shira* (head and neck) – 37, *Urah* (chest) – 9, *Prishtha* (back) – 14, *Udara* (abdomen) – 3, and *Shakha* (limbs) – 44. They

II. MATERIALS AND METHODS

A. *Gulpha Marma* in Classical *Ayurveda*

1) By *Acharya Sushruta*

- *Gulpha Marma* is one of the 107 *Marma* points.

- Number: 2 in total (one on each lower limb).
- Location: At the junction of the foot and leg, corresponding to the ankle joint.
- Structure: It is a *Sandhi marma*.
- Injury effects: *Ruja* (pain), *Stabdapaadata* (paresis), *Khanjata* (functional loss or limping).
- Measure: 2 *angulas*.

2) By *Acharya Charaka*

The *Charaka Samhita* does not list all 107 *Marma* points like *Sushruta* does. However, it discusses related ideas, such as vital points and trauma outcomes in areas like *Shalya Tantra* and *Vata*-related diseases.

- *Acharya Charaka* talks about sensitive spots in various contexts but does not specifically mention *Gulpha Marma*.
- His emphasis is more on functional systems than on structural details.

Anatomical Correlation (Modern View)

Gulpha Marma connects to key ankle structures such as:

- The ankle joint,
- Distal tibiofibular articulation,
- Various ligaments: medial malleolar, anterior, deltoid, anterior talofibular, posterior talocalcaneal, fibulocalcaneal, and lateral talocalcaneal,
- Associated tarsal articulations.

Aspect	Details
Location	Ankle joint below the malleoli, over subtalar joint
Size (Pramāṇa)	2 <i>angula</i> (~finger width)
Type	Limb (<i>Shakha-Gata</i>), Joint (<i>Sandhi</i>), Pain-causing (<i>Rujakara</i>) <i>marma</i>
Anatomy	Ankle joint, ligaments, distal tibio-fibular articulation
Injury Impact	Pain, stiffness, deformity, impaired movement
Therapeutic Use	Addresses paralysis, neural disorders, sciatica, ankle stiffness, and leg pain

Rujakara Marma:

Meaning and Etymology

- *Rujakara* = "That which causes pain"
- *Ruja* = Pain
- *Kara* = Causing or generating

Thus, *Rujakara Marma* refers to important points in the body that cause severe pain when injured but do not result in immediate death or disability.

Classical *Ayurvedic* Context

This classification means *Rujakara Marmas* are the *Marma* points that primarily cause intense pain when injured, without leading to fatal or deforming outcomes.

Classification of *Marma* (107 Total)

Type of effect from injury	Number of <i>Marma</i>	Effect
<i>Sadyapranahara</i>	19	Immediate death
<i>Kalantara pranahara</i>	33	Delayed death
<i>Vaikalyakara</i>	44	Deformity
<i>Rujakara</i>	08	Painfull, but no death/deformity
<i>Vishalyaghna</i>	03	Death upon removal of object

Only 8 out of 107 *Marma* points are classified as *Rujakara*.

List of *Rujakara Marmas* (8 Total)

Name	Location	Region
<i>Gulpha</i>	Ankle joint(2 – both sides)	Lower limb
<i>Manibandha</i>	Wrist joint(2 – both sides)	Upper limb
<i>Kurchashira</i>	Near wrist(2 – both sides)	Upper limb
<i>Kurcha</i>	Near ankle(2 – both sides)	Lower limb

These *Marma* points are mostly *Sandhi* (joint) *Marmas*. They cause pain and discomfort upon injury, but do not lead to life-threatening outcomes.

Anatomical Correlation (Modern Anatomy)

Ayurvedic Name	Modern Equivalent	Involved Structures
<i>Gulpha</i>	Ankle Joint	Tibia, fibula, talus, ligaments, synovial membrane
<i>Manibandha</i>	Wrist Joint	Radius, ulna, carpal bones, joint capsule
<i>Kurcha</i>	Medial side of foot (arch)	Plantar fascia, flexor tendons, tibialis posterior
<i>Kurchashira</i>	Area above the wrist (flexor retinaculum)	Flexor tendons, median nerve, carpal tunnel area

Ruja means pain, and *kara* means causing. *Rujakara Marmas* cause severe pain but do not lead to death or permanent disability.

So, an injury to a *Rujakara Marma* results in:

- Intense pain
 - Inflammation
 - Functional disturbance (e.g., movement problems)
 - But not fatal or permanently deforming outcomes
- Thus, *Gulpha Marma* is considered a *Rujakara Marma* for several reasons:
1. Location at a Highly Mobile Joint
 - *Gulpha* is at the ankle, crucial for standing, walking, running, and balance.
 - It is a weight-bearing joint.
 2. Complex Anatomical Structure
 - Multiple tendons, ligaments, nerves, and blood vessels are involved.
 - An injury here can awaken nerve endings, causing acute pain.
 3. Injury Effect: Severe Pain (*Ruja*)
 - Caused by:
 - Rich innervation (many nerve connections)
 - Tight joint capsule
 - Inflammation in a confined space
 - Even minor trauma (like a sprain or dislocation) can cause sharp, radiating pain.
 4. No Fatal or Major Structural Damage
 - Injuries to *Gulpha*, while painful, seldom lead to death or permanent disability.
 - Therefore, it is not categorized as a *Sadyapranahara Marma* (immediately lethal) or a *Vaikalyakara Marma* (causing deformity).
 5. *Sushruta's* Classification
 - Ancient texts like the *Sushruta Samhita* clearly define *Gulpha Marma* as a *Rujakara Marma*.

Gulpha Marma is classified as *Rujakara* because:

Feature	Anatomical Explanation
Pain production	Due to rich innervation of the joint and soft tissues
No death upon injury	No vital organs involved; not life-threatening

Clinical Relevance

- Today, this *Marma* relates to conditions like:
 - Ankle sprains
 - Achilles tendon injuries
 - Tarsal tunnel syndrome
 - *Ayurveda* recommends *Marma Chikitsa*, *Abhyanga*, *Bandhana*, and *Agnikarma*, to relieve pain and swelling in *Gulpha Marma* injuries.
- Gulpha Marma* is classified as a *Rujakara Marma* because injuries here cause intense pain due to the involvement of joints and a rich neurovascular supply. However, these injuries do not result in death or deformity. This classification helps *Ayurvedic* practitioners identify important but non-lethal body points that require careful attention in treatment and surgery.

III. RESULT

Structural Components of *Gulpha Marma*

- Bones: The tibia, fibula, and talus form the ankle's structure.
 - Ligaments: Key ligaments, including lateral and medial collateral ligaments, provide stability.
 - Tendons: The tendons of muscles like the tibialis anterior and gastrocnemius are crucial for movement.
 - Nerves: Posterior tibial, sural, peroneal.
 - Vascular supply: Posterior tibial artery, dorsalis pedis.
- Symptoms of *Gulpha Marma Abhighata*
- Pain: The main symptom is severe pain at the injury site, a hallmark of *Rujakara Marma*.
 - Restricted Movement: Trauma to *Gulpha Marma* limits ankle joint movement, affecting daily tasks.
 - Limping: Pain and restricted movement may lead to limping as individuals avoid putting weight on the affected joint.

Feature	Anatomical Explanation
No permanent deformity	Injuries usually heal without residual disability
Functionally important	Central to locomotion; pain disrupts mobility temporarily

Thus, *Gulpha Marma* represents a highly sensitive joint where trauma causes pain but not fatal results or ongoing function loss, fitting the *Ayurvedic* definition of a *Rujakara Marma*.

Effects on Joint Function

- Biomechanical Dysfunction: Injury to *Gulpha Marma* can disrupt normal ankle biomechanics, impacting stability and function⁷.

- Potential for Severe Outcomes: Like other *Marma* injuries, there is a risk of significant consequences, including joint function loss and severe pain, affecting overall mobility and life quality⁸.

IV. DISCUSSION

Interpreting *Gulpha Marma* as *Rujakar Marma* in *Ayurveda* has important clinical implications, especially for managing pain and dysfunction related to the ankle joint. *Gulpha Marma* is recognized as a *Sandhi Marma*, a key joint point, and as a *Rujakar Marma*, which shows its connection to pain when injured. This view highlights the need to protect and treat this area to prevent severe pain and loss of function.

Gulpha Marma can help relieve pain associated with conditions like diabetic peripheral neuropathy and frozen shoulder. Stimulating this point can improve blood flow and decrease discomfort, as shown by significant improvements in patients with these problems⁹. *Marma* therapy, particularly involving *Gulpha Marma*, aids in treating neuromuscular pain by using methods such as the Gate Control Theory of Pain, which alters nervous system activity and encourages endorphin release¹⁰. Certain *Marma* points, especially in the lower limbs, can also help with headaches, showing the versatility of *Marma Chikitsa* in treating various types of pain¹¹. *Gulpha Marma* can play a role in rehabilitation plans for sports injuries, helping speed up recovery through better blood circulation and pain relief. Regular stimulation of this *Marma* point can boost flexibility and reduce the risk of injuries, which can have a positive effect on athletic performance.

V. CONCLUSION

The current study on the anatomy and function of *Gulpha Marma* supports its classification as a *Rujakara Marma*, an important point mostly linked to pain from injuries. *Gulpha Marma* is located at the ankle joint. It is a *Sandhi Marma* where multiple structures, such as bones, ligaments, tendons, nerves, and blood vessels, come together. This makes it complex and functionally important. The findings match classical *Ayurvedic* views, showing that trauma to this area, even if not fatal, causes severe pain and possible disability due to damage to essential neurovascular and musculoskeletal components. The connection with modern structures like the posterior tibial nerve, saphenous nerve, and key ankle ligaments strengthens the traditional understanding that this *Marma* point is sensitive and vulnerable. Functional assessments show that injuries to *Gulpha Marma* lead to movement difficulties, instability in the ankle joint, and chronic pain. This confirms its classification as *Rujakara*, or pain-inducing.

This study highlights the need to protect *Gulpha Marma* during surgical, diagnostic, and therapeutic procedures involving the ankle area. It also provides a foundation for combining *Marma* science with modern anatomical and functional insights, encouraging further interdisciplinary research.

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