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Janu Marma: A Literary Review Co-Relation with Modern Concern

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Abstract: ***The description of Marma is an important part of Ayurvedic Rachana Sharira (Anatomy). Acharya Sushruta discusses the Marma as an anatomical aspect of several bodily parts. In the human body, total marma points are 107. Janu Marma is one of them. It is a Sandhi Marma which is located at the knee joint. Several anatomical structures are connected to Janu Marma, each of which can be injured by disease or external factors, resulting in temporary or permanent impairment or loss of function. The knee joint, the body's largest and most complex synovial joint, comprises the femur, tibia and patella. It includes three sub-joints: patellofemoral, lateral tibiofemoral, and medial tibiofemoral joints. This work is an attempt to provide accurate guidelines on the location, composition and structural anatomy of Janu Marma in comparison to modern science.***
Keywords: Marma, Janu Marma, Janu Sandhi, Knee Joint, Synovial joint

I. INTRODUCTION

Marma is an important and distinctive concept of *Ayurvedic Rachana Sharir* which is very well described *by Acharya Sushrut*. *Marma* are the body's vital points where *Mamsa, Sira, Snayu, Asthi* and *Sandhi* anastomose together [1]. The term *"Marma"* is derived from *"Mri Dhatu"* and *"Manin" Pratya*, meaning "which causes death" [2]. *Acharya Dalhan also defined Marma*– as *"Marayanti Iti Marmani"* [3].

It is said that *Marma's* science expertise was also utilised in battle. The *Vedas* contain instructions for protecting *Marma* (vital parts) on the battlefield as well as tactics for assaulting *Marma* locations to incapacitate the opponent.

There are 107 *Marmas* in the human body, with eleven (11) in each *Shakha* (extremity), three (3) in *Kostha (Udar),* nine (9) in *Urah*, fourteen (14) in *Prishta*, and thirty-seven (37) in *Jatru* (head and neck) [4]. *Marma* is classified into several groups based on *Shadang* (location), *Rachana* (structure), *Praman* or *Pariman* (measurement) and *Parinam* (injury effect). Out of this, as per *Shadang* (location), the classification is mentioned above. According to *Rachana* (structure), *Marmas* are classified into 5 types - *Mamsa Marma* (11), *Sira Marma* (41), *Snayu Marma* (27), *Sandhi Marma* (20) and *Asthi Marma* (8) [5].

Janu Marma is a *sandhi marma* which is situated in the *adhoshakha* in between thigh and leg. It can be compared with the knee joint in modern literature. The knee joint is one of the important joints of the body for various movements of the lower extremity. Present work is been taken up with an idea of updating early concept of a better understanding of *Janu Marma.*

II. AIM AND OBJECTIVES

1) To study the *Janu Marma* on cadaveric dissection said by *Sushruta* in modern light.
2) To locate the exact situation of *Janu Marma*.

III. MATERIAL AND METHODS

1) Various literary sources of Ayurveda and modern medical science have been explored to study the subject of Janu Marma.
2) Dissectional study on Cadaver to locate the situation of Janu *Marma.*

A. Janu Marma

The particulars of *Janu Marma* are as follows:

1) Name of the *Marma – Janu Marma*
2) Location – *Sakhthigata* (Lower Limb); At the junction of *Uru* and *Jangha* [6]
3) Number – 02 (One in each limb)

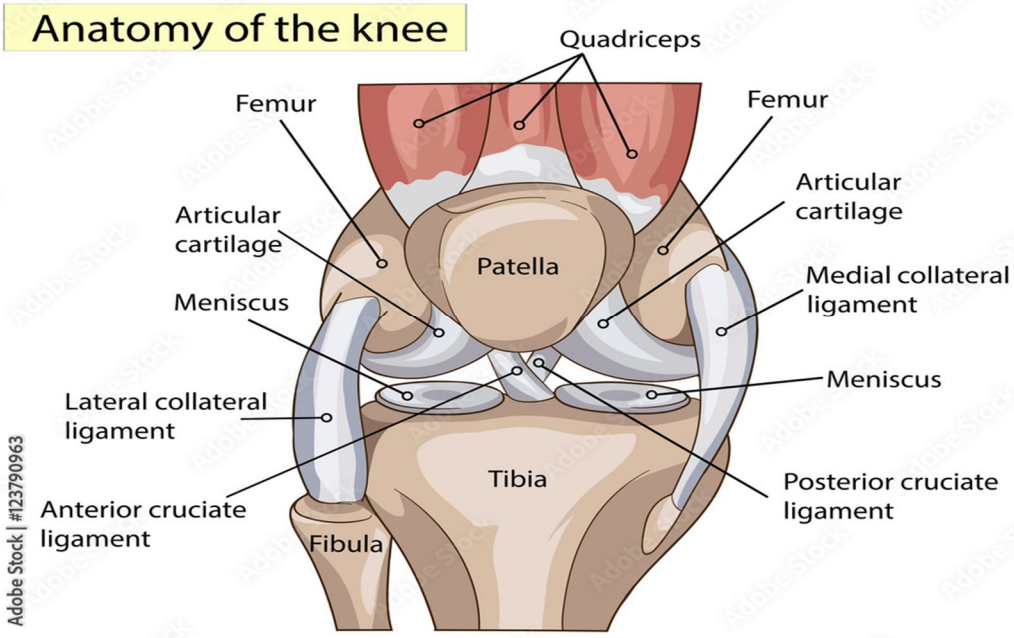
4) Type
a) *Rachana Anusar – Sandhi Marma* [7]
b) *Parinam Anusar – Vaiklayakara Marma* [8]
5) *Pariman (Praman) – 3 Angula* (3 Finger breadths) [9]
6) *Marma viddha lakshana – Khanjata* (Limping/Lameness) [10]

B. Knee Joint [11]

The knee joint is the largest and most complex joint of the body. It is the biggest synovial joint in the body. This joint is formed by the fusion of three bones i.e. Femur, Tibia and Patella. The complexity of this joint is due to the fusion of three joints in one – 1. An intermediate patellofemoral joint between the patella and the patellar surface of the femur. 2. A lateral tibiofemoral joint between the lateral condyle of the femur and the lateral condyle of the tibia. 3. A medial tibiofemoral joint between the medial condyle of the femur and the medial condyle of the tibia. The patellofemoral joint is a saddle joint while remaining two joints are condylar joints. The knee is composed of three partially separated compartments, creating a complicated "hinge" joint. It possesses two incompatible traits of stability and mobility [12]; since it is the most highly strained joint in the body.

C. The Ligaments of Knee Joint

The knee joint is supported by the following ligaments –
1. Fibrous capsule 2. Ligamentum patellae 3. Tibial collateral or medial ligament 4. Fibular collateral or lateral ligament 5. Oblique popliteal ligament 6. Arcuate popliteal ligament 7. Anterior cruciate ligament 8. Posterior cruciate ligament 9. Medial meniscus 10. Lateral meniscus 11. Transverse ligament
The knee joint also includes a fibrous capsule which is thin and deficient anteriorly.



D. Bursae Around the Knee

As many as 12 bursae have been described around the knee—four anterior, four lateral and four medial. These bursae are as follows.
Anterior: 1. Subcutaneous prepatellar bursa 2. Subcutaneous infrapatellar bursa 3. Deep infrapatellar bursa 4. Suprapatellar bursa
Lateral: 1. A bursa deep to the lateral head of the gastrocnemius. 2. A bursa between the fibular collateral ligament and the biceps femoris. 3. A bursa between the fibular collateral ligament and the tendon of the popliteus. 4. A bursa between the tendon of the popliteus and the lateral condyle of the tibia.
Medial: 1. A bursa deep to the medial head of the gastrocnemius. 2 The anserine bursa is a complicated bursa which separates the tendons of the sartorius, the gracilis and the semitendinosus from one another, from the tibia, and from the tibial collateral ligament. 3. A bursa deep to the tibial collateral ligament. 4. A bursa deep to the semimembranosus.

1) Blood Supply

The chief sources of blood supply are: 1) Five genicular branches of the popliteal artery. 2) Descending genicular branches of the femoral artery. 3) Descending branch of the lateral circumflex femoral artery. 4) Two recurrent branches of the anterior tibial artery. 5) Circumflex fibular branch of the posterior tibial artery**.**

2) Nerve Supply

1) Posterior division of femoral nerve (through branches to the Vasti) 2) Tibial nerve 3) Common peroneal nerve 4) Obturator nerve, through its posterior division.

IV. OBSERVATION & RESULT

The following structures were observed at the location of *Janu Marma* during the dissection by removal of Superficial fascia and deep fascia.

S. No.	Ayurvedic View	Modern Correlation
1.	*Mansa*	Medial and lateral head of gastrocnemius, quadriceps femoris, hamstring, Popliteus and Plantaris muscles
2.	*Sira*	Popliteal artery with its branches and popliteal vein with its tributaries.
3.	*Snayu*	Capsular ligament, Ligamentum patellae, Cruciate ligaments, medial ligament, lateral ligament, lateral and medial meniscus
4.	*Asthi*	Condyles of Femur and Tibia, Patella
5.	*Sandhi*	Knee joint

V. DISCUSSION

Acharya Sushruta defined *marma* as a combination of *Mansa* (Muscles), *Sira* (Vessels), *Snayu* (Ligaments/Tendons), *Asthi* (Bones), and *Sandhi* (Joints). Every *marma* contains all of the five structures listed above. Individual *marma* has a different proportion of each structure. One of the five elements is predominant, while the other four are only slightly present.

Janu Sandhi is the region in between the *Uru* (thigh) and *Jangha* (leg) of *Adho Shakha* (lower extremity). We can compare *Janu Sandhi* with Knee Joint in modern literature. *Janu marma* is a *sandhi marma* which is present in the area of 3 digits (*Angula*) at the junction of *Uru* and *Jangha*. So, it can be considered that *Janu Marma* is located in the Knee Joint and is associated with its ligaments and muscles.

VI. CONCLUSION

The name *"Janu"* has a literary interpretation of "knee," and *Janu Marma* is located in the territory of *Janu Sandhi*, which is the region of the knee joint. *Janu marma* refers to the anatomical structures that may be seen between two imaginary equidistant horizontal plains one and a half *Angula* from the Centre of the patella. Depending on the severity and location of the damage, *Acharya Sushruta* has identified two types of injury or impairment induced by *Janu Marma* trauma: *Ruja* (pain) and *Khanjata*. *Khanjata* is an anomalous gait that leads to permanent or temporary limping with or without pain. It is caused by an injury to the *Janu Marma* rather than an adjacent region. As a result, the *Janu Marma* is a *Vaikalyakar marma*. Hence results from a little damage to the *Janu Marma*, but a major injury might result in the anatomical structures, performing such functions at the time of free flexion, extension and rotation of the knee joint. It should be taken important contents of particular *marma* getting involved, in course of injury.

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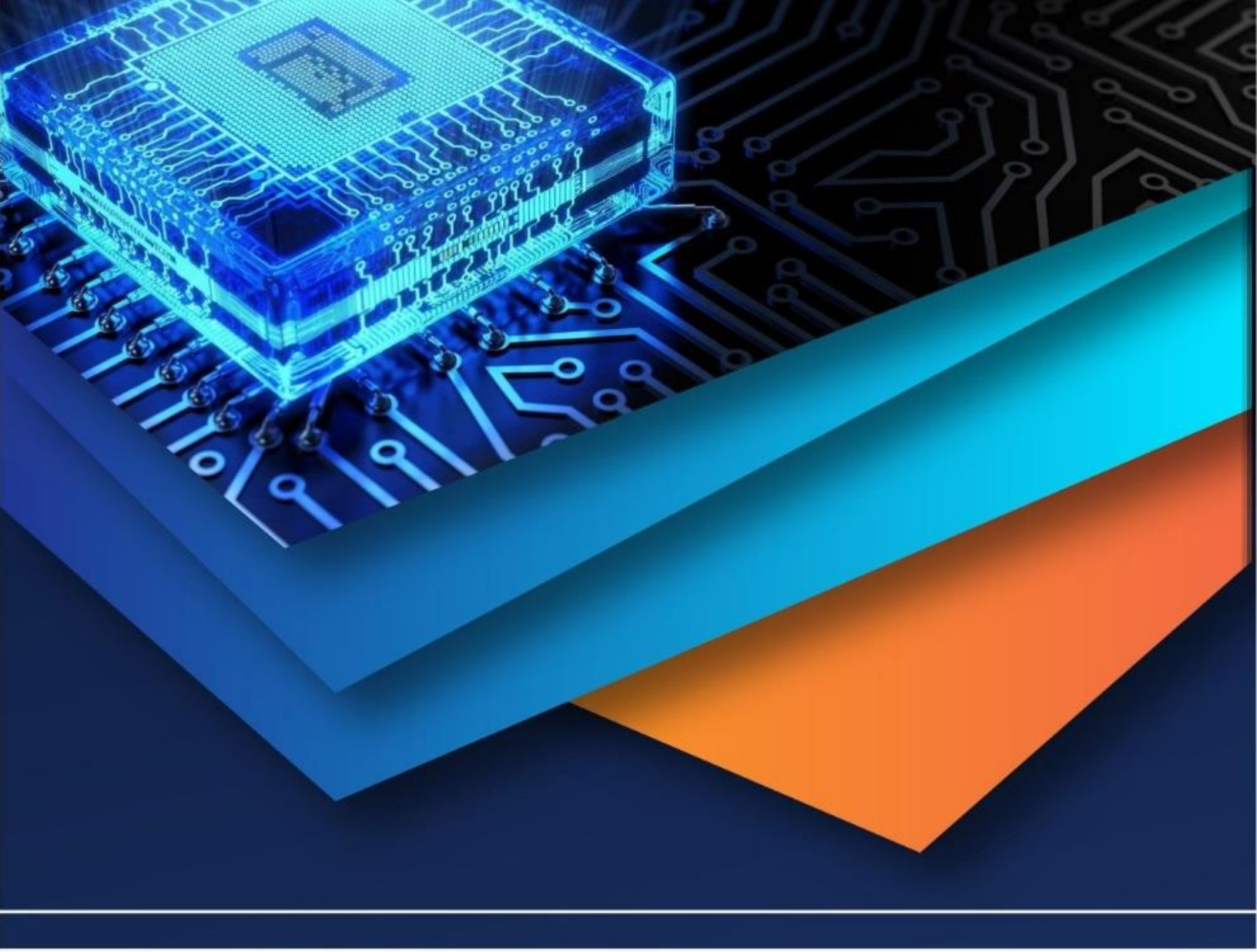

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