

AN OBSERVATIONAL STUDY OF JANUMARMABHIGHAT WITH SPECIAL REFERENCE TO KHANJATA

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ABSTRACT

Marma is the vital point of the body which is comprise of union of *mamsa*, *sira*, *snayu*, *asthi*, *sandhi* and *prana*. Any injury to vital part i.e. *marma* will leads to death or death like symptoms. *Janu marma* is one of the *sandhi* and *vaikalyakara marma* which is located in the lower limb at the knee joint. Injury to this *marma* will leads to *khanjata* i.e. limping of lower limb. Though detailed description is found in *Samhita* regarding *janumarma*, the exact location of *janu marma* is very hard to traced. *Janumarma* is comprise of many structures, it is hard to identify the structure which produce *khanjata* when *janumarma* get injured. Even the advancement in the medical science have still some lacuna while treating the knee joint injury or even after the operative procedure performed to treat knee injury the person may suffer with some limping. So, exact location of *janumarma* needed to identify with which we can prevent the consequence such as limping that occur even after the surgical procedure.

KEYWORDS: *Khanjata*, *Janumarmabhighata*.

INTRODUCTION

Janu Marma is one of the *Vaikalyakara Marma* located in the lower limb at the junction of *uru* and *jangha* i.e. at the junction of thigh and leg. So basically, it is located at the knee joint. *Janu Marma* is *sandhi Marma* which have fusion of three bones i.e. patella, Femur and Tibia. These three bones fused as lateral Patellofemoral joint, medial Patellofemoral joint and Femorotibial joint and form knee Joint. *Janu Marma* when get injured cause symptoms termed as *Khanjata* which means walk with improper gait or walk with limp. *Janu Marma* injury leads to improper gait or walk with lamping certainly going to hamper the routine of individual as well as damaging the confidence of a person. As multiple structure contributes to form the *janu Marma* its hard to identify the most vulnerable structure which is responsible for causing *khanjata*.

As per modern view we can traced the location of *Janu Marma* around the knee Joint. Knee joint is complex, Synovial and Saddle variety of joint present in the lower limb. Knee joint comprise of bones, muscles, bursa, nerve, blood vessels and ligaments which guiding the different movement of knee joint. Knee joint is most frequently involved joints in injuries in sport person (Such as hockey, basketball, Cricket, football), bike riders and even while performing a routine activity. Knee

joint in one of the joints which bears a maximum weight while routine activity, which explains its importance and its role in different movement of knee joint such as flexion, extension, medial and lateral rotation. So, its vulnerability can be understood.

AIM

- To study *Janumarmabhighata* w.s.r. to *Khanjata*

OBJECTIVES

- Literary study of *Janu Sandhi* (knee joint), *Janu Marma* as per *Ayurvedic* and modern text.
- Determination of anatomical location and structures present at the site of *Janusandhi* by Cadaveric study.
- Clinical study of *Janumarmabhighat Lakshana* by observing the victims of knee injury

MATERIALS

Cadaveric Data: - Cadaveric data have been collected by performing the dissection of knee joint as per the cunnighams manual. For Cadaveric data dissection of 2 cadavers (4 Knee Joints) at *Rachana Sharir* dept, Parul Institute of Ayurved have been Performed.

Clinical Data

A. Study Design

60 cases of knee injury in which *Khanjata* and pain appears, will be taken and their radiographs will be studied and structures responsible for manifestation of above symptoms will be observed.

Each diagnosed case of injury to *Janu Sandhi* (knee joint) of both gender of age between 20-60 years will be considered for study.

The cases visiting the Parul Ayurveda hospital, Parul Sevasharam Hospital, Khemdas Ayurveda hospital.

Written consent of the patients will be taken during study.

B. Inclusion criteria

- Diagnosed cases of Knee joint injury irrespective of causative factor
- Age in between 20 to 60 years
- Both male and females are included.

C. Exclusion criteria

- H/o knee replacement
- H/o amputation
- Congenital deformities
- Coma
- Mentally retarded

D. Subjective parameters

- Koos pain score

E. Objective Parameters

- Radiological findings (Investigations):
- MRI (if necessary)

METHODOLOGY

Cadaveric Phase

For *anguli pramana* measurement, Horizontal length from middle phalanx of index finger up to middle phalanx of ring finger was measured. Length from middle phalanx of index finger up to ring finger was 6 cm.^[1]

For identify the surface anatomy of *Janumarma*, midpoint of patella is taken as a centre point. From the midpoint i.e. the centre point of patella one circle drawn have 6 cm of radius and which is considered as a surface area of *Janu marma*. For depth measurement of *janu marma*, nail paint done up to mark of 6 cm and nail was inserted on the centre point of patella to identify the structure found under the surface area of knee joint.

1st Horizontal Skin incision was taken at the anterior part of junction between upper 2/3 and lower 1/3 of front of thigh.^[2]

2nd Horizontal incision was taken from the anterior part of junction between upper 1/3 and lower 2/3 of leg.^[3]

3rd vertical incision was taken from the midpoint of 1st incision up to the midpoint of 2nd incision.^[4]

4. Reflection of skin and superficial fascia.

5. window dissection of *Janumarma* was conducted.

Clinical Phase

60 Patient who were suffering from knee joint injury irrespective of internal or external source given detailed description of Project were selected for the study. Informed and written consent have been taken from the Patient. Data of Injured knee Joint were collected with the help of Radiological Findings. The structural changes that taking place in the *janu Marma* after external and internal injuries were identified with the help of MRI. *Khanjata* was measured of injured knee Joint with the help of the gonio meter. Grading of pain have been done with help of Koos Pain Scale and assessment of pain was done on the basis of answers of Question (koos Pain Scale question) given by patient.

OBSERVATION ON CADAVERIC STUDY

After taking the incision and nailing explained in methodology of study following structure were noted under the surface area of *janu marma*.

Structure seen under the skin

- Superficial fatty layer
- Deep fascia
- Patellar plexus



(Fig No.1 Structure seen under the deep fascia)

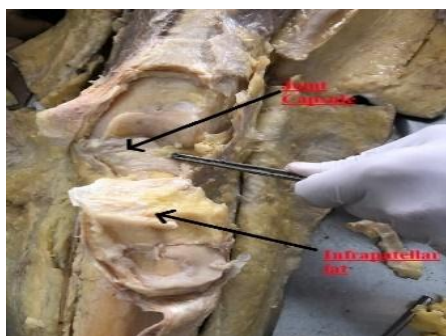
Structure seen under the Deep fascia

- Patella
- Ligamentum patella
- Quadricep femoris tendon
- Bursa



(Fig No.2 Patellar Bursa)

Structure found under the patella



(Fig No.3 Structure seen After patella)

- Infrapatellar fat
- Joint capsule
- Patellofemoral joint

Structure seen under the knee joint capsule (on bending knee joint)



(Fig No.4 Knee Joint Capsule, Intercondylar area of femur, ACL, Medial and Lateral Meniscus, coronary ligament, Medial and lateral collateral Ligament, Transverse Ligament)

- Anterior cruciate ligament
 - Intercondylar area of femur
 - Medial meniscus
 - Lateral meniscus
 - Coronary Ligament
 - Medial collateral Ligament
 - Lateral collateral Ligament
 - Transverse Ligament
 - Tibiofemoral joint
- Observation on Clinical data

Table No.1 Clinical data.

Sr.no	Structure	Involvement	Active flexion	Passive flexion	Active extension	Passive extension	Koos pain Score
1	Patella	26	65.8	78.9	1.73	3.42	76.23
2	Patellofemoral joint	1	69.5	88.7	7.62	9.6	72.1
3	Tibiofemoral Joint	2	87.5	106	0	5	59
4	Capsule of knee Joint	1	76	100	0	0	67
5	ligamentum Patella	3	69.3	85	3.6	8.3	74.3
6	Medial Meniscus	36	68.5	81.5	3.6	6.3	74.63
7	Lateral Meniscus	12	73	89.3	7.5	10	59.66
8	ACL	29	73.06	88.31	5.10	7.4	73.86
9	PCL	13	75	92.07	2.92	5.76	75.61
10	Medial collateral ligament	4	70.5	91	6.75	11.75	63.25
11	Lateral collateral ligament	4	69	85.5	5	9.25	53.5
12	Arcuo-popliteal ligament		75	88	0	0	76
13	Medial Tibial plateau	2	63.5	92.5	0	5	49
14	Lateral tibial Plateau	11	75.18	90.36	3.51	6.18	57.63
15	Intercondylar eminence	1	67	72	8	10	70
16	Popliteofibular ligament		87	101	8	10	80
17	Osteoporotic changes	11	67.9	79.63	1.81	3.81	74.81

DISCUSSION

On the basis of current study, its seen that knee joint injury have maximum time involvement of Medial meniscus, ACL and Patella. Even though involvement of any structure came in the entity of janumarma going to hampered the knee movement or produced khanjata, these 3 structures are going to hampered the knee activity at maximum level.

Involvement of patella

Patella is one of the largest sesamoid bones of the body and is most anterior structure of knee joint. As patella is most anterior and most exposed structure, chances of injury to patella found very common. Patella located in the front of knee joint and is gliding on lower end of femur during the various movement of knee joint such as flexion, extension, internal rotation. Study conducted on “The effect of patellectomy on knee function “reported loss of active and passive range of motion of knee joint. Complete patellectomy resulted in greater ligament

instability, quadriceps atrophy and loss of quadriceps Strength, which prove the vitality of Patella. Above study shows that even the advancement in medical science also can't neutralised the concept of *marma* explained by *acharya Sushruta*.^[5]

Even in this study clinical data suggest that involvement of patella injury make knee joint movement significantly difficult as well as limited. Study shows that involvement of patella affects the movement of knee joint. Among 60 patient of knee joint injury 26 patient i.e. 43.3% of patient have involvement of patella. Clinical data shows average 65.76 active flexion, 76.15 passive flexion, average 1.73 active extension and average 3.26 passive extension and 76.23 average Koos pain Score in patient have involvement of patella in knee joint injury.

Involvement of ACL

Anterior cruciate ligament is ligament found in between the tibia and femur. It begins from anterior part of intercondylar area of tibia, runs upward, backward and laterally where it attached to the posterior part of medial surface of lateral condyle of femur. It gets stretched during the extension of knee joint and get relaxed during the flexion movement of knee joint.

Anterior cruciate ligament is most anterior among the cruciate ligament hence anterior cruciate ligament injury is found more common than the posterior cruciate ligaments. Present study shows that out of 60 patient 29 patient have involvement of Anterior cruciate ligament. Involvement of ACL shows average 73.44 active flexion, 87.24 passive flexion, average 5.34 active extension and average 7.41 passive extension and 73.86 average Koos pain Score.

Study conducted with title "Prevention and management of Post-operative complication following Acl reconstruction" presented in NCBI Journal shows that there are estimated 2,00,000 ACL reconstruction take places. Among of them more than 10% people have post-operative complain such as Arthrofibrosis, Knee Joint stiffness and Restricted ROM, which prove the vitality of ACL.^[6]

Involvement of Medial Meniscus

Meniscectomy is one of the most popular orthopaedic procedures, but long-term results are not entirely satisfactory and the concept of meniscal preservation has therefore progressed over the years. **Article with title** "The knee meniscus: management of traumatic tears and

degenerative lesions" Shows that there is 6 to 28% chance of disturbance in routine life were experience by patient. Though it is depending on the level of injury and which part of meniscus get involved.^[7]

Medial meniscus found more frequently get damaged during knee joint injury as it is more frequently get used during the routine movement of knee joint. Even in this study, out of 60 patient 36 patient have involvement of medial meniscus which is the maximum involvement out of any other knee joint structure. Medial Meniscus when get damaged shows average 68.61 active flexion, 79.16 passive flexion, average 3.75 active extension and average 6.25 passive extension and 74.63 average Koos pain Score.

CONCLUSION

1. On the basis of cadaveric study following structure Falls in to the entity of janumarma after considering janumarma praman as 3 angula,

1. Patella 2. Patellar plexus 3. Knee joint capsule 4. Anterior cruciate ligament 5. posterior cruciate ligament 6. Fibular or Lateral collateral Ligament 7. Tibial or Medial collateral Ligament 8. Transverse Ligament 9. Patellar tendon 10. medial meniscus 11. lateral meniscus 12. medial tibial plateau 13. lateral tibial plateau 14. femoral condyle 15. Tibia up to tibial tuberosity

2. Khanjata, the lakshana of janu marmma abhighata can be seen within the knee joint injuries. Acharya sushruta explained khanjata as vikalagatitvwam means walking with difficulty which is seen in present study. Though advancement of science can help to resolve some knee joint injuries such as ligament repair, TKR (total knee replacement) etc. with outcome of the current study we concluded that any injury to the above-mentioned structure is going to hamper the range of motion of knee joint, which provides strong support to the Acharya Sushruta's Concept of marma.

3. Observation and discussion on outcome of current study shows that degree of range of motion during flexion and extension get significantly decreased when medial meniscus and patella involved in knee joint injury. Even the outcome of koos pain score suggest that quality of life hamper get disturb even at greater extent when these two structures with other structure get involved.

4. Hence we find that effect of Janumarmaabhighata is relevant in correlation with Khanjata.

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