



AN OBSERVATIONAL CROSS-SECTIONAL STUDY TO EXPLORE THE VAIKALYAKARA EFFECT OF JANU MARMA THROUGH ANATOMICAL CONSIDERATIONS OF KNEE JOINT INJURIES RELATED TO SPORTS

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ABSTRACT

Introduction: The aim of the study was to determine the time to and rate of the return to sports (RTS) after knee joint injury. The data obtained was analysed to fine line the commonly affected anatomical entity responsible and to correlate with *Janumarma*. **Methodology:** The symptoms assessed from the case proforma and MRI were compared to the *Janu Marmabhighatha Lakshanas*. The grading of injury and *Khanjatha* was determined with the help of unique scoring adapted for the study. **Results:** Based on literary review *Khanjatha* can be defined as a weakness in limbs resisting its complete functional mobility. Anterior Cruciate Ligament (ACL) was found to be the most vulnerable structure. Cadaveric dissection studies showed the morphological significance of ACL to be placed as a *Kandara* has been surmised. **Conclusion:** *Khanjatha* is concluded as the difficulty in regaining complete functional mobility, which was observed in 70% of ACL injuries highlighting the plausible correlation of ACL as *Janumarma*.

Keywords: Sports injury, *Khanjatha*, *Janu marma*

INTRODUCTION

The concept of *Marma Shareera* though discussed widely for its therapeutical implications, leaves us a wide arena of untapped resources as diagnostic and prognostic tools. Its multitude of venues which is highly resourceful even in emergency management and sports medicine is yet to be utilized in a broader perspective. Sports persons often face the challenge of reduced competence following injuries despite of ultra-modern medical assistance. Reconstructive and rehabilitation therapies followed in sports medicine is having relatively limited curative rates especially in knee joint injuries. Conclusively the rate of players returning to competitive sports post trauma is alarmingly low. In this context it is simply logical to apply the prognostic views of *Acharya Susruta* about the *Janumarma* and its *Abhigatha* in the light of modern radiological imaging techniques. Based on these views, treatment protocol could be devised incorporating all the possibilities of Ayurvedic approach in *Marmachikitsa* to provide a better alternative for surgically reluctant patients in this evolving medical world.

Aim of The Study

1. To establish the true implication of *Vaikalya (Khanjatha)* explained by *Acharya Susruta* in the context of *Janumarmabhigata*
2. To identify the most vulnerable part of *Janu sandhi* which when injured results in *Khanjatha* and there by establish it as a plausible correlation for *Janu marma*.

Methodology

Study setting: Department of *Rachana Shareera*, Alvas Ayurveda College, Moodbidri

Study was planned in 4 phases

Phase 1: Literary and conceptual study

Included data compilations from *Bruhatrayee*, *Laghutrayee* and other classical books including journals, presented papers, previous work done

Phase 2: Detailed study of *Janu Sandhi Shareera* with the help of cadaveric dissection

Dissection of *Janu sandhi* was carried out in cadavers to determine anatomical structures contributing to *Janu Marma*

Phase 3: Study based on clinical observations

Carried out in Diasman sports clinic Kondotty under the guidance of Dr. Arshad.

Phase 4: Radiological study

Based on MRI and supporting evidence from xrays

Sample size: 30

Inclusion criteria: Patients diagnosed with injuries to knee related to sports., H/o trauma within a minimum duration of 6 months. Age group- 15 to 35 years.

Exclusion criteria: Patients suffering from arthritic disorders., Patients having any congenital joint anomalies.

Assessment criteria: Informed consent was obtained from patients, A detailed case format (*Rugna patrika*) was prepared to assess the precipitating complaints in knee joint injury cases and compared it to *Janumarmabhigatha lakshana* explained in classics. The injured structure and the grade of injury was determined on the basis of collected MRI reports and analysed. The severity of *Khanjatha* was determined with the help of a unique scoring adapted for the study based on which the data was collected through systematic follow up.

Results

Literary Review

Based on the considerations and deliberations of references compiled from *Bruhatrayee* the literary implications of *Khanjatha* can be generalised from a visible limping to any weakness interfering the joint's return to its functional rigour.

Also, *Vaghbata* highlights the involvement of *Kandara* in development of *Khanjatha*.

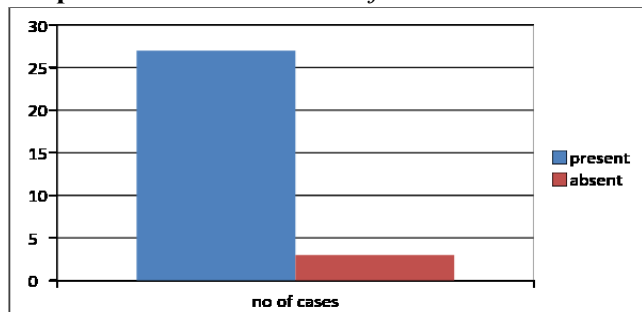
Cadaveric Dissection

On careful examination of dissected specimens, it was observed that the appearance of ACL is morphologically meeting the criteria for the Ayurvedic classification of *kandara* i.e. *Vrutha Snayu*.

Radiological Findings

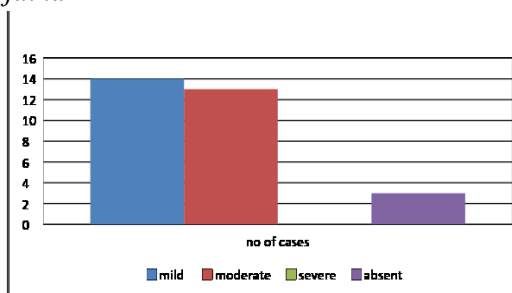
Majority of the cases shows involvement of ACL alone or with meniscus or adjoining ligaments.

Graph 1: Distribution of *Khanjatha*



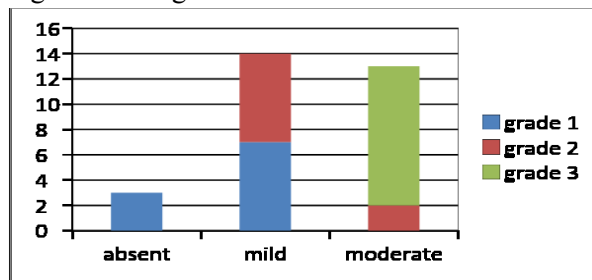
27 among 30 cases shows presence of *Khanjatha* when returning to sports (RTS), 3 patients has no significant *Khanjatha* observed.

Graph 2 Distribution According to Degree of *Khanjatha*



Khanjatha was found to be absent for 3 patients, 14 patients showed mild *Khanjatha* and 13 showed moderate *Khanjatha*. No patients reported severe *Khanjatha*.

Graph 3 Comparison of *Khanjatha* Score with Radiological Findings



Among patients who were reported no *Khanjatha*, 10% were having grade 1 injury, 50% of patients who reported mild *Khanjatha* had grade 1 injury while the other 50% had grade 2 injury. Among patients who had moderate *Khanjatha*, 15.3% of them were having grade 2 injury, 84.6% were having grade 3 injury.

Table 1: Comparison of *Khanjatha* score with distribution based on injured structure

Structure involved	Mild	Moderate	Absent	Total
ACL	7	3	0	10
ACL, MCL	1	0	0	1
Medial Meniscus	0	0	1	1
Lateral Meniscus	1	0	2	3
ACL, Medial Meniscus	1	6	0	7
ACL, Lateral Meniscus	3	2	0	5
MCL, Medial Meniscus	1	0	0	1
ACL, MCL, Lateral Meniscus, LCL	0	1	0	1

Graph 4: Comparison of *Khanjatha* score with distribution based on injured structure

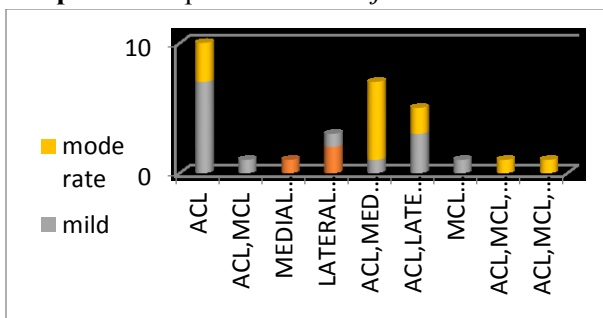


Table 2: Severity of *Khanjatha* based on injured structure

Injured structure	Severity of <i>Khanjatha</i>
Only ACL	70%-mild <i>Khanjatha</i>
	30%-moderate <i>Khanjatha</i>
ACL & medial meniscal injury	85.7%- mild <i>Khanjatha</i>
	14.3%-moderate <i>Khanjatha</i>
Involving ACL & lateral meniscus	60%- mild <i>Khanjatha</i>
	40%-moderate <i>Khanjatha</i>
Involving lateral meniscal tear.	90%- no <i>Khanjatha</i>
	10%- mild <i>Khanjatha</i>

DISCUSSION

In the light of literary analysis, we can specify the term *Khanjatha* to a weakness of the *Janu sandhi* to return to its full-fledged functions there by influencing their RTS. 83% of the cases shows involvement of ACL alone or with meniscus or adjoining ligaments. Altogether 25 patients show involvement of ACL ligament in which 40% involves only ACL and the rest shows involvement of meniscus & collateral ligaments. All the patients involving ACL injury shows mild or moderate *Khanjatha*. Also, there is reference regarding the involvement of *Kandara* in developing *Khanjatha*. This signifies the findings in cadaveric studies providing morphological evidence to assume that ACL could be classified as a *Vrutha Snayu/Kandara*. The severity of the *Khanjatha* and the rate of RTS is invariably depending on the grade of injury, among which 84.3% of grade 3 injury showing moderate *Khanjatha* in grade 2 injury 65.3% and in grade 1 50% of cases were presenting *Khanjatha* a miniscule of 10% was showing absence of *Khanjatha*, in injuries related to menisci. In the light of above told postulations we may contemplate that cruciate ligaments are the commonly injured structure & cases with ACL injury symptomatically resemble *Janumarmabhighata*.

CONCLUSION

Among the sample size of 30 the injuries involving ACL showed a total of 40% mild and 43% moderate *Khanjatha*. None showed severe *Khanjatha* which means visible impairment affecting gait. This summarises the fact that even if the acute symptoms associat-

ed is relieved considerably due to timely intervention the person finds it difficult to return to competitive sports, which is exactly the prognosis mentioned by *Susrutha* in the definition of *Vaikalyakara Marma*. Hence, we may conclude that the anatomical structure involved in *Janumarmabhighata* is ACL.

Clinical Relevance

Outcomes following anterior cruciate ligament (ACL) injury are considered poor even after timely intervention. The study provides us ample evidence to ascertain that *Marmabhighata Chikitsa* protocol should be devised and followed in managing such conditions and educating the patients about the impending complications will be a positive approach.

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