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STUDY OF "JAAL" IN GULFA STHAN WITH REFERENCE TO MODERN ANATOMY

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SUMMARY

This is a study of Jaal in Gulfa sthan with reference to modern Anatomy with dissection of cadaver nearly 40 year old Indian male of left leg in anatomy department. In which study of Jaal in Gulfa sthan (ankle region).

KEYWARD: Jaal, Retinaculum, Gulfa sthan, Ankle region.

INTRODUCTION

Ayurveda is the India's ancient science. It is a legend, our heritage. It is a part of our culture. Ayurveda is not only a science of medicine. It is a way of life. It is a science which incorporates into it both preventive and curative aspects of medicine. It is our complete and most elaborated guide to health, happiness and longevity.

प्रयोजनं चास्य स्वस्थस्य स्वास्थ्यरक्षणमातुरस्यविकर प्रशमनम् च॥

च.सू ३०/२६

Acharya Sushruta, the founder of Ayurvedic Sharir and father of surgery elaborated human anatomy in Sharir sthana of Sushruta Samhita.

In Ayurveda, Acharya Sushruta elaborated human anatomy in Sharir sthana. He described human cadaveric dissection for study of Rachana Sharir.

AYURVEDIC LITERATURE OF JAAL

Acharya Sushruta described various Anatomical structures in Sharir Sthana like sira, snayu, asthisanghat, dhamani, jaal, kurcha, peshi, preparation of dead body for dissection and mode of dissection etc. Jaal is one of the important structures of Rachana Sharir.[5]

Acharya Sushruta described total number of Jaal are 16 in our body, Jaal are network of Mansa, Sira, Snayu, and Asthi each separately in manibanda and gulpha they are present together combined with one another and forming windows (space in between) by such combination by these networks the entire body in made 'gavaksita' (Having opening space all over).

मांससिरास्नाय्वस्थिजालानि प्रत्येकं चत्वारि; तानि मणिबन्ध

–गुल्फ़–संश्रितानि परस्परनिबध्दानि परस्परगवाक्षितानि चेति

यैर्गवाक्षितमिदं शरीरम् ॥

सु.शा. ५/१२

MODERN LITERATURE

Jaal - Rete,
plexus
network,
Interlacking decussation *parishabdasharir'*.

Jaal - A Net
A web
Lattico, window
A kind of churing vessel. Student Sanskrit-English Dictionary

Retinaculum[3] (Retinaculum is Latin for "retainer")

In the vicinity of the ankle joint, the tendons of the muscles of leg are bound down by localized, band shaped thickings of the deep fascia termed a retinacula which collectively serve to prevent bowstringing of the underlying tendons.

The name and location of this retinaculum are follows:-

Sr.no.	Name of Retinaculum	Location of Retinaculum
1	Superior Extensor Retinaculum	Front of the Ankle
2	Inferior Extensor Retinaculum	Front of the Ankle
3	Flexor Retinaculum	Posteromedially
4.	Peroneal Retinaculum	Lateral side of leg
	(i)Superior Peroneal Retinaculum	-
	(ii) Inferior Peroneal Retinaculum	-

- **The relations of retinaculum of lower limb are given follow:-**

Sr. no.	Name of Retinaculum	Location	Tendon Relations	Artery and Nerve Relations
1	Superior Extensor Retinaculum	Front of Leg, 5 cm Above the Ankle Joint.	1) Tendon of Tibialis Anterior 2) Tendon of Extensor Hallucis longus 3) Tendon of Extensor Digitorum Longus Longus 4) Tendon Peroneous Tertius	1) Anterior Tibial Artery 2) Deep Peroneal Nerve
2	Inferior Extensor Retinaculum	Front of the leg, Front of the Ankle and dorsum of the foot.	1) Tendon of Tibialis Anterior 2) Tendon of Extensor Hallucis Longus 3) Tendon of Extensor Digitorum Longus Longus 4)Tendon Peroneous Tertius	1) Anterior tibial Artery 2) Deep Peroneal Nerve
3	Flexor Retinaculum	Postero Lateral compartment of Leg, Near the Ankle.	1) Tendon of Tibialis Posterior 2) Tendon of Flexor Digitorum Longus 3) Tendon of Flexor Hallucis Longus	1) Posterior Tibial Artery 2) Tibial Nerve
4	Peroneal retinuculum	Lateral Side of leg, behind the lateral Malleolus	1) Tendon of Peroneus longus 2) Tendon of Peroneus brevis	---

METHODOLOGY

First of all, the cadaver is kept ready in the dissection hall with all basic requirements such as instruments named scalpel and blade, blunt and toothed forcep, gloves, essential reference books etc.

- Adult male body is kept in supine position on the dissection table.
- The surface marking of front of leg and dorsum of foot with anatomical landmarks is done on human cadaver with the help of surface marking Anatomy books.[2]
- Leg region dissection started with dissection of leg of a male cadaver provided by Sharir Rachana Department in C.S.M.S.S Ayurved Mahavidyalaya, Aurangabad.
- Skin is lifted and separated from the midline, then it was reflected laterally on either sides.

- Identify the containt of the superficial fascia on front of leg and dorsum of foot.
- Superficial fascia of leg was identified and separated, and then it was reflected laterally. After reflect the superficial fascia see the Retinaculum at ankle region.

OBSERVATION

- After dissection of Ankle region, four Retinaculum were noted which are follows:-

Sr.no.	Name of Retinaculum	Dimensions	
1	Superior Extensor Retinaculum	3 cm broad vertically	
2	Inferior Extensor Retinaculum	**Stem** 1.5 cm broad	**Upper band**
			1 cm wide
			Lower band
			1 cm wide
3	Flexor Retinaculum	2.5 cm broad	
4.	Peroneal Retinaculum	Minute structure	
	(i)Superior Peroneal Retinaculum	--	
	(ii) Inferior Peroneal Retinaculum	--	

DISCUSSION

- In Paarishabdama shabdartha shariram, Gulpha is described as Ankle.
- Acharya Gananath Sen is described Gulpha sandhi as Ankle joint.
- According to Acharya Sushruta Jaal are present at Gulpha sthana.
- According to modern literature, retinaculums are present at the Ankle they are four in number :-

Sr.no.	Name of Retinaculum
1	Superior Extensor Retinaculum
2	Inferior Extensor Retinaculum
3	Flexor Retinaculum
4.	Peroneal Retinaculum
	(i)Superior Peroneal Retinaculum
	(ii) Inferior Peroneal Retinaculum

- Retinaculum is tough, fibrous band shape thickenings of the deep fascia at ankle region. Which hold the muscles tendons close to the joint and prevent them from springing forward in dorsoflexon of the Ankle.
- Meaning of the retinaculum in Dorland's illustrated medical dictionary[4] (page no. 1621) is,

'A structure that retains an organ or tissue is place'.

- So the function of retinaculum is to hold the muscles tendons and vessels which passes under in it.

- According Physiological function of Jaal is to catch something. Like the fisher man is use the fishing net to catch the fish.
- The Physiological function the Jaal and retinaculum is, to catch the muscles tendon, arteries and nerves are taken close to the ankle joint.
- Physiological function of Jaal is same as the Retinaculum. So Jaal correlated with the Retinaculum not the other things.
- Acharya Sushruta discribed, Gulpha Marma (vital spot) as a Shakha marma and Sandhi marma. Injury to this causes pain and stiffness in leg, shortening of leg and swelling of the joint.
- According to the Ayurvedic literature, Jaal is present at Gulpha sthana, not at Gulfa sandhi.

Hence, we have not included the Gulpha Marma in our study.

- In Ayurveda the Retinaculum may be called as follows:-

Sr.no.	Name of Retinaculum	Ayurvedic Name
1	Superior Extensor Retinaculum	Urdhava Prasarni bandhani pattika
2	Inferior Extensor Retinaculum	Adha Prasarni bandhani pattika
3	Flexor Retinaculum	Sankonchak bandhani pattika.
4.	Peroneal Retinaculum	Vaahya Parshava bandhani pattika
	(i)Superior Peroneal Retinaculum	-
	(ii) Inferior Peroneal Retinaculum	-

- These above Ayurveda names of the retinaculums are given as Physiological work and region of the retinaculums.

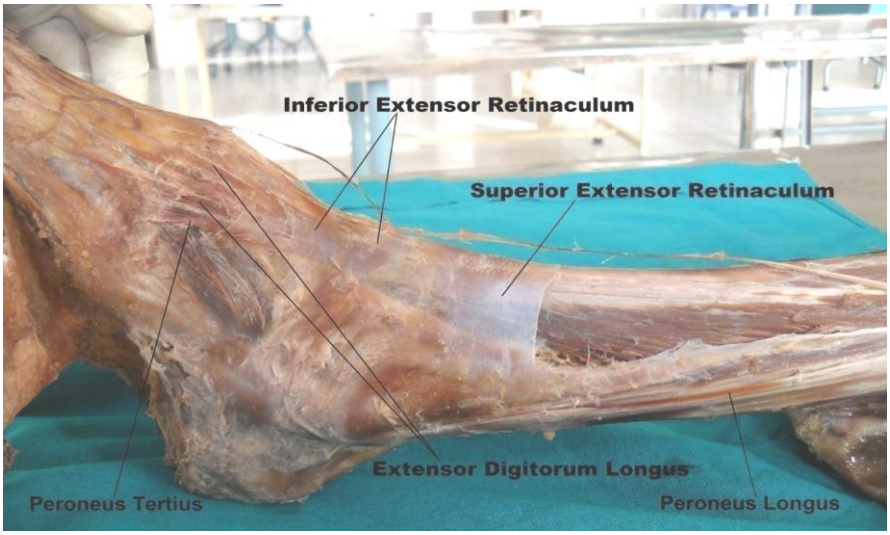

Image No – 1 Superior Extensor Retinaculum of Left Leg And Inferior Extensor Retinaclum of Left Leg.

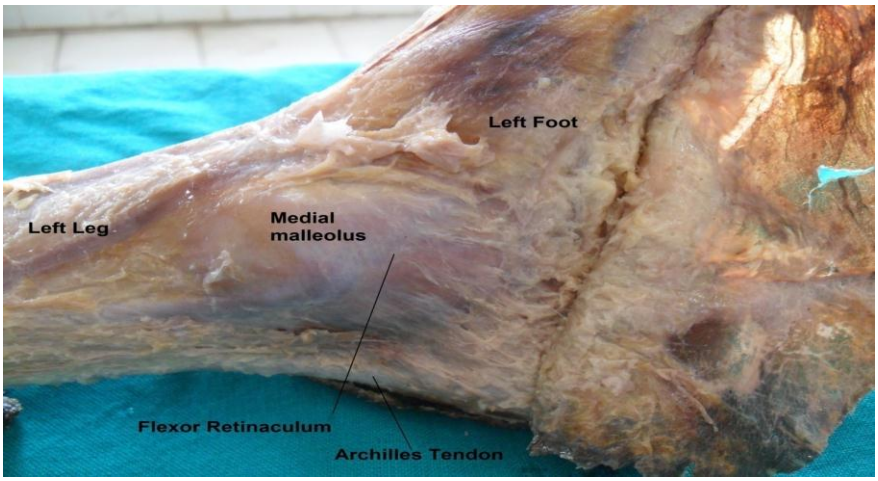

Image No – 2 Flexor Retinaculum of Left Leg.

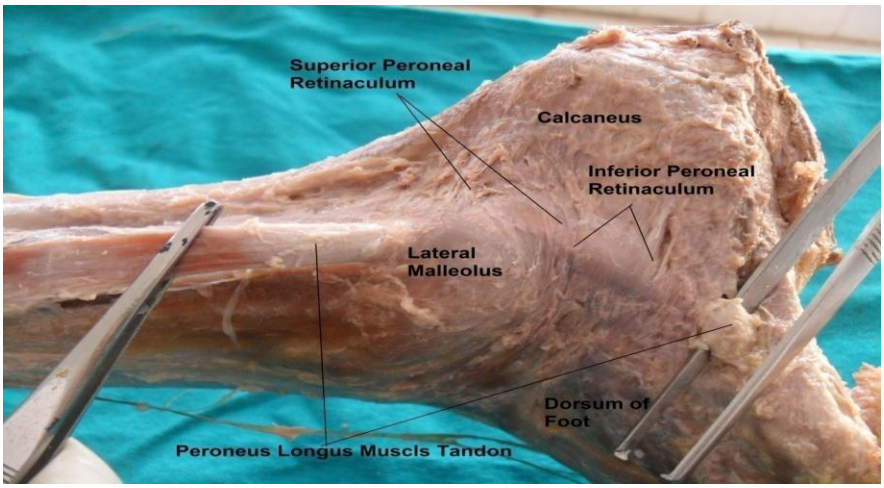

Image – 3 Superior Peroneal Retinaculum And Inferior Peroneal Retinaculum of Left Leg.

CONCLUSION

- Acoording to modern science the function of retinaculum is to hold the tendon close to the joint and prevent them from springing forwards in dorsoflexion of the ankle. In Ayurveda the physiological work of Jaal are also same.
- Acharya Sushruta has described the Jaal sthana and number. Jaal are present in Gulpha and Manibandha sthana. In Modern Science, the Retinaculum according to their region wise is present in Ankle region.
- In Sushrut Samhita Sharirsthana 5/12, Jaal are described as “Gavaksita” (having windows or space in between).
- In retinaculum, the fiber is not continous so it having space in between the retinaculum is look like as web structure.

RESULT

- Retinaculums are present at ankle region and have the same number, which are described in Ayurvedic literature of Jaal.
- The Retinaculum is corelated with Jaal.

  Jaal (Retinaculum) present in the Gulpha sthan(ankle region) are four in numbers.

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