ABSTRACT

Background of study:
The knowledge of Marma dates back to Vedic period. The references of 107 Marma, its classification, location, dimension, impact of injury etc are available in the literature of Ayurveda. They are classified on the basis of structure, region, prognosis, dimension and number.

Vitapa is Adhoshakagata Vaikalyakara Marma of 1 Anguli Pramana. Sushruta opinion Vitapa as Snayu Marma whereas Vagbhata mention it as Sira Marma. Its location, Pramana, structural component and Viddha Lakshana are mentioned in gross. The anatomical structures related to VitapaMarma are not mentioned with respect to its Pramana and Viddha Lakshana. There is a need to understand anatomical component of VitapaMarma on the basis of apparent information available from classical texts. To fulfill the above mentioned needs the conceptual analysis regarding Vitapa Marma is needed.

Objectives:
To analyse the structural entity of the Vitapa Marma on the basis of mentioned location, Pramana and Viddha Lakshana.

Materials and Methods:
Literature review regarding the *Vitapa Marma* (structural and applied aspect related) was done through various authorized text books, journals and published articles, and then the critical analysis was done to evaluate the possible structural entity of the *Vitapa Marma* on the basis of classical information.

**Results:**
The location of *Vitapa Marma* is in the inguinal region and the structural entity of superficial inguinal ring and structures passing through this opening is *Vitapa Marma*.

**KEYWORDS**
Inguinal canal, Inguinal ring, *Marma*, Spermatic cord, *VitapaMarma*
INTRODUCTION

The concept of Marma has been described in the text of Ayurveda since long time ago. The Marma point has been considered as important point and hence Acharya has explained it in a separate chapter. The importance of the Marma was observed in warfare where the warrior used to devitalize the specific point to destroy the enemies. Rig Veda was the first literature where Marma are explained. Warriors were advised to protect their vital parts of the body before going to warfare. In the ancient days the Marma points were used to destroy the enemy but in the present era these point needs to be explored for their structural entity to have good surgical practice, as well as to achieve the good result of up growing Marma therapy.

Acharya Sushruta has defined Marma is the site where there is conglomeration of Mansa, Sira, Snayu, Asthi and Sandhi. Especially Prana dwells at these sites. According to Astanga Sangraha, any part of the body where the uneven pulsations/reflex are elicited and pressure over that part causes pain, is called a Marma.

There are 107 Marma. Marma are classified in different groups on the basis of various aspects, such as; on the basis of predominant structural entities, based on impact of injury, basis of location on body, and based on measurement. Vitapa Marma is a Snayu Marma. Vagbhata has mentioned Vitapa Marma as Sira Marma. Vitapa Marma is one among the 107 Marma and is considered as one of the Adha-Shakhagata Marma. Vagbhata mentioned its location is in between Muska and Vamkshana.

Sushruta mentions that its location is in between Vamkshana and Vrishana. It is considered as Vaikalyakara Marma on the basis of prognosis or impact of injury. While explaining the Viddha Lakshana of Vitapa Marma, Sushruta has mentioned Alpa Shukrata and Shandya. Vaikalyakara Marma has Soma Guna predominance, by the virtue of stability and cold qualities of the Soma(Jala) Guna it supports the Prana. So, injury to these Marma causes deformity but rarely grievous injury may cause death. Proper treatment by an efficient Vaidya may limit the risk to deformity. As per Sushruta and VagbhataPramana of Vitapa Marma is 1 Angula.

DISCUSSION

Discussion on the basis of mentioned location of Vitapa Marma

Vitapa Marma is situated in between Vrishana and Vamkshana. Mushka and Vrishana is the scrotal sac enclosing the
male gonad i.e. testis\textsuperscript{12,13}. In case of female the homologous organ for the scrotum is labia majors\textsuperscript{14}. As per contemporary science the surface marking and location of particular organ are on the basis of the surface land marks in the body that may be bony structure or/and muscular boundaries with respect to the skin surface. The scrotum is attached to root of penis\textsuperscript{15} which is at the level of the inferior part of pubic symphysis\textsuperscript{16,17}. At the root of penis a point which indicates the beginning of median raphe of the scrotum can be taken for the land mark of Vrikshana, in case of female this point will be the midpoint between upper parts of two labia majora near the clitoris. 

_Vamkshana_ is Adhoshakagata Sandhi. It is _Chala type of Ulukhala Sandhi_\textsuperscript{18}. This is the hip joint in contemporary science. The landmark given for the hip joint is the mid inguinal point. At this point the pulsation of the femoral artery can be felt against head of femur\textsuperscript{19}. Head of femur articulate with the acetabulum of the hip bone to form hip joint. Head of femur lies at the level of midinguinal point which gives the idea of hip joint.

The location of the _Vitapa Marma_ may be midway between the mid inguinal point and lower part of pubic symphysis in the groin region. It is located one inch lateral to the symphysis pubis in the superficial ring through which the spermatic cord passes. The involved anatomical structures are external oblique, internal oblique, rectus abdominis muscle, femoral nerve, spermatic cord in male & round ligament in female\textsuperscript{20}.

**Discussion on the basis of mentioned Pramana of Vitapa Marma**

The _Vitapa Marma_ is 1 Anguli. One Anguli is approximately 2 cm\textsuperscript{21}. The length of the inguinal canal is 4cm. The measurement of the superficial inguinal ring is 2.5cm from apex to base and 1.25 cm at base\textsuperscript{22}. The length of the spermatic cord is about 7.5 cm and total length of the spermatic cord from superficial ring to the apex of testis is 3.5cm\textsuperscript{23}. Length of round ligament is 10 to 12cm long\textsuperscript{24}. The _Anguli Pramana_ of _Vitapa Marma_ and dimension of superficial inguinal ring is approximately equal to each other so, structural entity of superficial inguinal ring and the structures emerging out thorough it can be considered as _Vitapa Marma_. _Mishra J.N._ mentioned the _Vitapa Marma_ as the structure emerging out thorough superficial inguinal ring i.e. ilioinguinal and genitofemoral nerve with spermatic cord and round ligament in case of female\textsuperscript{25}.

**Discussion on the basis of structural entity of Vitapa Marma**

_Sushruta_ has mentioned the _Vitapa Marma_ as _snayu_. _Snayu_ are the binding structures.
Pratanavati Snayu is present in the Shaka and Sarva Sandhi. The boat built with wooden planks placed side by side, when fastened tightly by ropes become capable of carrying weight in water, steered by a sailor, similarly the various structure of body are held together by Snayu26.

Vagbhata has mentioned Vitapa Marma as the Sira Marma5. The structure that allows the Dravyas to flow through it is known as Sira27.

The inguinal canal contains spermatic cord in male and round ligament in female and ilioinguinal nerve in both28,29. The covering of the spermatic cord from outside to inside are; outer external spermatic fascia which is formed as elongation of the external oblique abdominis aponeurosis which also continue in covering testis, middle layer of cremasteric fascia formed by the aponeurosis of the internal oblique and transverse abdominis muscles, it also continues to enclose the testis. Inner layer of internal spermatic fascia formed by the extension of the fascia transversalis and it also extend up to scrotum. These three fascia coat are continuous with the corresponding layer of scrotum23. The contents of the spermatic cord are ductus deferens and artery to ductus deferens, testicular artery, cremasteric artery, pampiniform plexus of veins, lymphatics, genital branch of genitofemoral nerve, and remnants of processus vaginalis23,29.

Due to presence of the binding structure in the spermatic cord that forms the three fascial coat (external spermatic, cremasteric and internal spermatic fascia) along with presence of the ilioinguinal nerve and genital branch of genitofemoral nerve in male and round ligament in case of female, Sushruta opinion it as the Snayu Marma. Here, neuro-connective tissues are given importance regarding Vitapa Marma.

Due to presence of the channels carrying blood – arteries of ductus deferens, testicular artery, cremasteric artery and pampiniform plexus of vein, channels carrying male gamete – ductus deferens, channels carrying lymph – lymphatics. Vagbhata opines it as Sira Marma. Here, vascular component are given importance regarding Vitapa Marma.

Ghanekar B.G. interpreted Vitapa as inguinal canal since it is constituted by Snayu (aponeurosis). The content of this canal is spermatic cord30. Mishra JN. mentioned Vitapa Marma as a testicular circulatory branches and spermatic cord and spermatic cord lies within inguinal canal25. Thatte DG, Singh Mahendra& Lele Avinash mentioned Vitapa Marma as inguinal canal31,32,33. Srinivas Hejmadi mentions the Vitapa Marma as the channel for reproductive tissue34. Murthy KR
Srikanta mentions that Vitapa is inguinal canal and it consists of spermatic cord, testis and epididymis inside the scrotum and also mentions structure like Prostate gland, femoral and obturator nerves.\textsuperscript{35}

**Discussion on the basis of Viddha Lakshana of Vitapa Marma.**

Acharya Susruta and Vagbhata mentioned it as Vaikalyakara Marma and Viddha Lakshana of Vitapa Marma lead to Alpa Shukrata and Shandya.\textsuperscript{8,36} The ductus deferens in the spermatic cord is responsible for transporting the sperm.\textsuperscript{17} If it is obstructed or injured the sperm flow is obstructed that lead to decrease sperm count or absence of the sperm in semen during ejaculation that affect reproduction.\textsuperscript{37} The testicular artery and artery for ductus deferens and other arteries and vein are responsible for maintaining the tissue perfusion with nutrition and oxygen. The impact of injury in these particular vessels result in the ischemic condition of the testis, ductus deferens, even the structures of spermatic cord etc. followed by infarction and gangrene formation which ultimately lead to infertility. The round ligament of the uterus is the one of the main mechanical and primary support of the uterus.\textsuperscript{38,40} The normal position of the uterus is anteversion and anteflexion. Long axis of vagina and long axis of the cervix of uterus forms 90 degree called anteversion. Anteflexion orientation of uterus where the long axis of the body of uterus makes angle 125 degree with the axis of the cervical canal i.e. forward bending of the uterus on itself.\textsuperscript{39} The ligament pulls the fundus forwards and maintains the anteversion and anteflexion of the uterus.\textsuperscript{38,40} The impact of injury to the round ligament may lead to malposition of uterus, prolapse of the uterus, which ultimately affects the sperm propagation, conception, implantation leading to infertility.

**CONCLUSION**

On the basis of conceptual study, location of Vitapa Marma was found to lie on the midway between the mid inguinal point and the lower part of pubic symphysis. The Ardhagula Pramana of Vitapa Marma can be taken as the measurement of the superficial inguinal ring i.e. 2.5 cm, which is approximately equal to the Anguli Pramana of Vitapa Marma. Acharyas’s concept of Alpa Shukrata and Shandya is due to destruction of the structural entity of the superficial ring and the structure.
passing through it such as; ductus deferens, testicular artery, pampiniform venous plexus, artery to ductus deferens, ilioinguinal nerve, genital branch of genitofemoral nerve in case of male and round ligament of the uterus, genital branch of genitofemoral nerve & ilioinguinal nerve in female. Injury to these structures leads to obstructive sperm transmission in male and mal-position or prolapse of uterus in female which ultimately lead to infertility. Structural entity of Vitapa Marma should be protected during surgical practice and Marma therapy without altering the normal physiology.

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REFERENCES

12. Chaurasia BD. B D Chaurasia’s Human Anatomy Regional and Applied.
21. Vishwanath K. Concept of Pramana Shareera with special reference to Determine stature from Prabahu (Brachium), Dissertation, Bangalore; Rajiv Gandhi University of Health Science; 2006.
27. K.R. Srikantha Murthy, Illustrated Sushruta Samhita-Text, English translation,


