



Review Article

Exploring the Science of Marma - An Ancient Healing Technique: Definition and Properties of Marma

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Abstract. In the vast sea of the knowledge of Ayurveda, Marma is one of the extremely important topics. Marma points have been unanimously accepted as the 'seats of life' (Prana - the vital life force). If these locations are injured, then it may lead to severe pain, disability, loss of function, loss of sensation, or death. Therefore, the ancient scriptures have strictly directed that these vital locations should not be injured, and due care should be taken in this regard even while doing surgeries. However, recent researches indicate that if there is inflammation or pain at any Marma point, then stimulating its nearby Marma points can help in alleviating this pain. This Marma Therapy has been used in treating various physical and mental disorders, with encouraging results.

In view of the importance of Marma Science mentioned in scriptures and with regards to surgeries, as well as the encouraging outcomes of Marma Therapy in recent times, the present study was undertaken for an in-depth study of the Science of Marma. Part-1 of this study gave an account of various ancient / classical Indian scriptures that mention different aspects of the Science of Marma. The present article, which is Part-2 of this study, gives a detailed description of the number of marmas, their location, structures involved, correlation with Panmahabhutas, classification, as well as a detailed explanation of marmaghata or viddha lakshanas (effect of trauma), as given in classical texts written during Samhita kala. The anatomical correlation with modern science is also presented.

Keywords. Ayurveda, Marma Science, Marma Therapy, Marma Classification, Marmaghata

Introduction

In the vast sea of the knowledge of Ayurveda, Marma is one of the extremely important topics. Marma point is defined as anatomical site where muscles, veins, ligaments, bones and joints meet together (Sushruta Samhita Sharira Sthana 6/16) (1). According to Acharya Sushruta there are 107

marmas in human body (Sushruta Samhita Sharira Sthana 6/3) (1). These are very important vital places, that are the 'seats of life' (Prana - the vital life force) (Ashtanga Hridaya Sharira Sthana 4/2) (2). Any injury to these parts may lead to severe pain, disability, loss of function, loss of sensation, or

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death (3). It plays an important role in surgery; therefore, it is called 'Shalya Vishayardha' (half of the entire science of surgery) (Sushruta Samhita Sharira Sthana 6/35) (1). Acharya Sushruta states that Marma sthan, a very vital point, should not be injured and should be kept intact even while doing surgeries (Sushruta Samhita Sharira Sthana 6/21) (1).

However, recent researches indicate that if any Marma point is inflamed or painful, then stimulating its nearby Marma points can help in alleviating this pain (4). Several studies and texts have reported the therapeutic benefits of Marma Therapy in treating various physical and mental disorders (3-23).

Looking at the importance of the Marma Science with regards to surgeries, as well as their recent use and future possibilities as an effective therapeutic procedure, the present study has been undertaken for an in-depth study of the Science of Marma.

An account of various ancient / classical Indian scriptures, including the Vedas, Upanishads, Puranas, Samhitas, etc. (3-10,22-35), that mention different aspects of the Science of Marma, was given in Part-1 of this study (36). The present article, which is Part-2 of this study, gives the definition and a detailed description of the properties of Marmas, as stated in the classical texts, mostly written during Samhita kala. The description includes information about the number of marmas, their location, structures involved, correlation with Panmahabhutas, classification, as well as a detailed explanation of marmaghata or viddha lakshanas, i.e. the effect of trauma on Marmas. The anatomical correlation with modern science is also presented.

Derivation of the Word 'Marma'

The origin of word 'Marma' can be traced in various texts as follows:

Amarakosha

मृ - मनिन्, मृ + प्राणत्यागे

(Amarakosha 3/5/30) (37)

Amarakosha (37) explains that the word marma is derived from the sanskrit term 'mri- manin' or 'mri-pranatyage'. It means that which causes death or death like miseries.

Shabdakalpadruma

मृ + 'सर्वधातुभ्यो मनिन्'

(Shabdakalpadruma 4/144, chapter 3, pg. 941) (38)

Shabdakalpadruma (38) mentions that the word marma is derived from 'mri' dhatu. Its meaning is explained as sandhistanam (i.e. joining point of various structures) or jeevasthanam (seats of life) (38).

Raj Nighantu

मृ - मनिन्, जीव स्थाने: संधि स्थाने तात्पर्ये च।

(Raj Nighantu, Manushya Varga / 64) (39)

Raj Nighantukara opines that the word marma is derived from 'mri - manin', which means seat of life (jeevasthanam) or conglomeration of many important structures (sandhi sthana) (39).

Thus, based on the above descriptions, Marma is derived from the root word 'mri' with suffix 'manin'. The word 'Marman' is the singular form, which means jeevasthanam (seat of life) or sandhistanam (meeting place).

Etymologically each letter of word marma has got specific meaning - 'Ma' means prana or vayu, Repha denotes house or seat. Therefore, 'Marma' means seat of Prana or Vayu, where Prana is the vital life

force that governs all the physical and subtle processes of a living being (40-43).

Definitions of 'Marma'

According to Acharya Sushruta

मर्माणि मांससिरास्नाय्वस्थिसन्धिसन्निपाताः,
तेषु स्वभावत एव विशेषेण प्राणास्तिष्ठन्ति।
(Sushruta Sharira 6/15) (1)

Marma (fatal spots) are confluence of muscles, veins, ligaments, bones and joints. These are the places where the Prana (vital life force) resides naturally (1).

According to Ashtanga Sangraha

तत्पुनः मांससिरास्नाय्वस्थिसन्धिसन्निपातः।
तेन तस्मिन् पीड्यमाने विशेषतः प्राणबाधः॥
(Ashtanga Sangraha Sharira 7/28) (44,45)

Marmas are the sites where muscles, veins, ligaments, bones and joints meet. If they get traumatized, Prana gets destroyed (44,45).

According to Ashtanga Hridaya

मांसास्थिसनायुधमनीसिरासन्धिसमागमः।
(Ashtanga Hridaya Sharira 4/38) (2)

Marmas are the sites where muscles, bones, ligaments, artery, veins and joints meet each other (2). Prana is especially located there, and if they get afflicted, it may lead to death.

According to Acharya Chakrapani

तच्च मांस सिरास्नाय्वस्थिसन्धिषु निविष्टम्।
(Charaka Siddhi 9/3, Chakrapani Tika) (46)

The meeting point of muscle, vein, ligament, bone and joint is called Marma, which are dependent on these components (46).

According to Acharya Aruna Dutta

मरणकारित्वान्मर्म, मरणसदृशदुःखादयित्वाद्वा।

(Ashtanga Hridaya Sharira, Aruna Dutta Tika 4/37) (47)

Those locations, which when injured lead to destruction of life, are called Marmas (24,47).

According to Acharya Bhava Prakash

सन्निपातः सिरास्नायु संधिमांसास्थि सम्भवः।

मर्माणि तेषु तिष्ठन्ति प्राणाः खलु विशेषतः ॥

(Bhava Prakash, Purva Khand, Garbha Prakaran 3/223) (48,49)
The meeting point of vein, ligament, joint, muscle and bone is called Marma point (48,49). Prana especially resides in these points (48,49).

Lakshanas (Nature / Signs) of Marma

According to Acharya Sushruta

मर्माणि मांससिरास्नाय्वस्थिसन्धिसन्निपाताः,
तेषु स्वभावत एव विशेषेण प्राणास्तिष्ठन्ति,
तस्मान्मर्मस्वभिहतास्तांस्तान् भावानापद्यन्ते ॥
(Sushruta Sharira 6/15) (1)

Marma (fatal spots) are confluence of muscles, veins, ligaments, bones and joints (1). Prana (vital life force) especially resides in these locations; hence if the Marmas are injured, they produce their respective effect (1).

According to Acharya Dalhana

मारयन्तीति मर्माणि ॥

(Sushruta Sharira, Dalhan Tika 6/3) (50)

Any injury to marma points may lead to death (21,24,28).

According to Acharya Vagabhatta

विषमं स्पन्दनं यत्र पीडिते रुक् च मर्म तत् ॥

(Ashtanga Hridaya Sharira 4/37) (2)

That part of the body is Marma, where, on giving extreme (extraordinary) spandan (vibration) or on pressing, there is extraordinary pain (2).

According to Acharya Charaka

तेषामन्यतमपीडायां समधिका पीडा भवति,
चेतनानिबन्धवैशेष्यात् ।

(Charaka Samhita Siddhi 9/3) (51)

In case of affliction in any marma point, there is more pain (excruciating type) than any other part of the body, because of the specific attachment of chetana (consciousness) to these spots (51).

According to Acharya Sharangadhara

मर्माणि जीवधाराणि प्रायेण मुनयो जगुः॥

(Sharangadhara Samhita, Purva Khand, 5/39) (52)

The Marma points in the body are mostly the foundational locations of life - this has been told by the ancient sages (52). Prana especially resides in the Marma locations.

According to Acharya Bhava Prakash

मर्माणि तेषु तिष्ठन्ति प्राणाः खलु विशेषतः।

(Bhava Prakash, Purva Khanda 3/223) (48,49)

Marma spots are specific location of prana (vital life force) (48,49).

According to Raj Nighantu

जीव स्थानेः संधि स्थाने तात्पर्ये च।

(Raj Nighantu, Manushya Varga / 64) (39)

Marmas are seats of life (jeevasthana) and meeting point of many important structures (sandhisthana) (39).

All the above lakshanas show the importance and vitality of Marma points. Any injury, trauma or disease affecting Marma will cause death or miseries equal to death.

Classification of Marmas

In the ancient scriptures, Marmas have been classified in different ways, such as their location in different regions of the body, anatomy, size, effect of trauma on these, etc. This section illustrates the different types of classifications of Marmas.

Classification of Marmas according to their Location in different Regions of the Body

Table 1 gives the classification of Marmas according to their location in different regions of the body, i.e. upper limbs (22), lower limbs (22), abdomen and chest (12), back (14), supraclavicular region (neck and head) (37).

Anatomical classification of Marmas according to Acharya Sushruta

Acharya Sushruta (1) has classified Marmas into five types according to the Dhatu from which they are made. These types include Mamsa (Muscle), Asthi (Bone), Snayu (Ligament), Sira (Vessel) and Sandhi (Joint) (1).

Anatomical Classification of Marmas according to Acharya Vagbhata

Acharya Vagbhata has classified Marmas into six types according to the Dhatu bheda (2). He has added one additional Marma named 'Dhamani Marma' (2). These types include Mamsa (Muscle), Asthi (Bone), Snayu (Ligament), Dhamani (Artery), Sira (Vein) and Sandhi (Joint) (2).

Names of Marmas included under different anatomical classes

Table 2 gives the Names of Marmas included under different anatomical classes, i.e. Mamsa Marma (11), Sira Marma (41), Snayu Marma (27), Asthi Marma (8), Sandhi Marma (20), and Dhamani Marma (9).

Urdhva Shakhagata (Upper limbs) (11X2)	Adho Shakhagata (Lower limbs) (11X2)	Udaragata (Abdomen) & Urogata (Thorax) (12)		Prishthagata (Back) (7X2)	Urdhwajatrugata Supraclavicular region) (37)	
		Abdomen (3)	Thorax (9)		Neck (14)	Head (23)
Talahridaya-2	Talahridaya-2	Guda-1	Hridaya-1	Amsa-2	Nila-2	Vidhura-2
Kshipra-2	Kshipra-2	Vasti-1	Stanamula-2	Amsaphalaka-2	Manya-2	Phana-2
Kurcha-2	Kurcha-2	Nabhi-1	Stanarohita-2	Vrihati-2	Matrika-8	Apanga-2
Kurchashira-2	Kurchashira-2		Apalapa-2	Parshvasandhi-2	Krikatika-2	Avarta-2
Manibandha-2	Gulpha-2		Apastambha-2	Nitamba-2		Utkshepa-2
Indravasti-2	Indravasti-2			Kukundara-2		Shankha-2
Kurpara-2	Janu-2			Katikataruna-2		Sthapani-1
Ani-2	Ani-2					Shringataka-4
Urvi-2	Urvi-2					Simanta-5
Lohitaksha-2	Lohitaksha-2					Adhipati-1
Kakshadhara-2	Vitapa-2					

Table 1. Marmas in different regions of the body. (The numeric digits next to the Marmas state their respective numbers in the body)

*Mamsa Marma (11)	*Sira Marma (41)	*Snayu Marma (27)	*Asthi Marma (8)	*Sandhi Marma (20)	*Dhamani Marma (9)	
Talahridaya(4)	Urvi (4)	Nabhi (1)	Kurcha (4)	Katikataruna(2)	Janu (2)	Guda (1)
Indravasti (4)	Lohitaksha (4)	Nila (2)	Kurchashira (4)	Nitamba (2)	Kurpara (2)	Apastambha(2)
Stanarohita(2)	Vrihati (2)	Manya (2)	Kshipra (4)	Ansaphalaka(2)	Gulpha (2)	Vidhura (2)
Guda (1)	Parshvasandhi(2)	Matrika (8)	Ani (4)	Shankha (2)	Manibandha(2)	Shringataka (4)
	Hridaya (1)	Shringataka(4)	Kakshadhara(2)		Kukundara (2)	
	Stanamula (2)	Apanga (2)	Vitapa (2)		Krikatika (2)	
	Apalapa (2)	Phana (2)	Ansa (2)		Simanta (5)	
	Apastambha(2)	Sthapani (1)	Basti (1)		Adhipati (1)	
			Utkshepa (2)		Avarta (2)	
			Vidhura (2)			

Table 2. Names of Marmas included under different anatomical classes. (The numeric digits next to the Marmas state their respective numbers in the body). * According to Acharya Sushruta (Sushruta Samhita, Sharira Sthana, Chapter 6) (1). #According to Acharya Vagbhata (Ashtanga Hridaya, Sharira Sthana, Chapter 4) (2).

Classification according to the Size of Marmas

The Size of Marma varies from ardha-anguli (half finger) to hatheli (palm) or mushti (fist). Out of 107 marmas, 56 are of half finger size, 12 are of one

finger size, 6 are of two finger size, 4 are of three finger size, and 29 are of one palm or one fist size (Sushruta Sharira 6/28-30) (1).

Eka anguli pramana (1 finger size) (12)	Dwi anguli pramana (2 finger size) (6)	Tri anguli pramana (3 finger size) (4)	Eka hatheli/ mushti pramana (1 palm / fist size) (29)	Ardha-anguli pramana (Half finger size) (56)	
Urvi (4)	Gulpha (2)	Janu (2)	Kurcha (4)	Kshipra (4)	Vrihati (2)
Kurchashira (4)	Manibandha (2)	Kurpara (2)	Guda (1)	Talahridaya (4)	Ansa (2)
Vitapa (2)	Stanamula (2)		Vasti (1)	Indrabasti (4)	Ansaphalaka(2)
Kakshadhara (2)			Nabhi (1)	Ani (4)	Krikatika (2)
			Hridaya (1)	Lohitaksha (4)	Vidhura (2)
			Nila (2)	Apalapa (2)	Phana (2)
			Manya (2)	Apasthambha(2)	Apanga (2)
			Matrika (8)	Stanarohita (2)	Avarta (2)
			Simanta (5)	Katikataruna (2)	Utkshepa (2)
			Shringataka (4)	Kukundara (2)	Shankha (2)
				Nitamba (2)	Sthapani (1)
				Parshvasandhi(2)	Adhipati (1)

Table 3. Classification according to the Size of Marmas (Sushruta Sharira, 6/28-30) (1). (The numeric digits next to the Marmas state their respective numbers in the body)

Classification according to the Result / Outcome (Symptoms if Injured)

Table 4 gives the prognostic classification of Marmas, i.e. the classification according to the symptoms observed upon injury to a Marma point, which include Sadyah Pranahara (Immediate death

causing) (19), Kalantara Pranahara (Death causing after some time) (33), Vishalyagha (Fatal after removal of foreign material) (3), Vaikalyakara (Disabling) (44), and Rujakara (Painful) (8) (Sushruta Sharira, Chapter 6) (1).

Sadyah Pranahara (Immediate death causing) (19)	Kalantara Pranahara (Death causing after some time) (33)	Vishalyagha (Fatal after removal of foreign material) (3)	Vaikalyakara (Disabling) (44)	Rujakara (Painful) (8)		
Guda (1)	Kshipra (4)	Stanamula (2)	Utkshepa (2)	Lohitaksha (4)	Ansa (2)	Gulpha (2)
Vasti (1)	Talahridaya (4)	Simanta (5)	Sthapani (1)	Ani (4)	Ansaphalaka(2)	Manibandha(2)
Nabhi (1)	Indrabasti (4)	Katikataruna (2)		Urvi (4)	Krikatika (2)	Kurchashira(4)
Hridaya (1)	Apalapa (2)	Parshvasandhi(2)		Kurcha (4)	Nila (2)	
Matrika (8)	Apasthambha(2)	Vrihati (2)		Janu (2)	Manya (2)	
Shankha (2)	Stanarohita (2)	Nitamba (2)		Kurpara (2)	Vidhura (2)	
Shringat(4)				Vitapa (2)	Phana (2)	
Adhipati (1)				Kakshadhara(2)	Apanga (2)	
				Kukundara (2)	Avarta (2)	

Table 4. Prognostic classification of Marmas (Sushruta Sharira, 6) (1). (The numeric digits next to the Marmas state their respective numbers in the body)

Classification of Marmas according to Panchabhautika guna (Sushruta Sharira, Chapter 6) (1)

The classification of Marmas according to Panchabhautika guna is similar to the prognostic classification given in Table 4, wherein the correspondence between the Panchabhautika guna and the prognostic classification is as follows -

- 1) Agneya (having fire quality) (19) - these are Sadyah Pranahara Marma
- 2) Saumyagneya (having fire & water qualities) (33) - these are Kalantara Pranahara Marma
- 3) Vayavya (having air quality) (3) - these are Vishalyaghna Marma
- 4) Saumya (having water quality) (44) - these are Vaikalyakara Marma
- 5) Vayavya (having air with little fire quality) (8) - these are Rujakara Marma

Nature of Fatal Spots (Qualities of Marma or correlation with Pancha Mahabhutas)

The nature of Sadyah Pranahara marma is Agneya, i.e. having qualities of fire; therefore, owing to this fire like (sharp) quality, injury to these marma kills the affected person quickly (Sushruta Sharira 6/16) (1). The fatal time period of Sadyah Pranahara marma is less than seven days (Sushruta Sharira 6/23) (1). These marma are nineteen in number (Sushruta Sharira 6/8) (1). If an injury occurs at the border or nearby area of the location of Sadyah Pranahara marma, the occurrence of death is slightly delayed, i.e. the effect is similar to that of Kalantar Pranahara marma (Sushruta Sharira 6/22) (1).

The nature of Kalantar Pranahara marma is Saumyagneya, i.e. having qualities of both fire and water; therefore, although due to their fire like nature, an injury to these marma kills the affected

person quickly, but because of the cold and stable nature of soma (water), the occurrence of death is delayed (Sushruta Sharira 6/16) (1). For Kalantar Pranahara marma, the fatal time period is from fifteen days to one month (Sushruta Sharira 6/23) (1). These are thirty three in number (Sushruta Sharira 6/8) (1). If an injury occurs at the border or nearby area of the location of Kalantar Pranahara marma, it causes deformity, i.e. the effect is similar to that of Vaikalyakara marma (Sushruta Sharira 6/22) (1).

Vishalyaghna marma are Vayavya, i.e. having qualities of air. If these marma are injured by a shalya (foreign body), then because of their Vayavya nature, as long as the air remains obstructed inside (i.e. prevented from coming out) by the mass of the shalya (foreign body), the person stays alive, but as soon as the foreign body is pulled out, the air residing in the fatal spot comes out and the person dies. However, after the injury, if the shalya is not pulled out before the completion of the auto healing process, then it provides protection to the Prana at that location until the wound is healed normally, and the shalya is pulled out along with pus (Sushruta Sharira 6/16) (1). Vishalyaghna marma may also sometimes lead to death if these are heavily injured (Sushruta Sharira 6/23) (1). These are three in number (Sushruta Sharira 6/8) (1). If an injury occurs at the border or nearby area of the location of Vishalyaghna marma, it causes deformity, i.e. the effect is similar to that of Vaikalyakara marma (Sushruta Sharira 6/22) (1).

Vaikalyakara marma are Saumya, i.e. having qualities of moon / water. Because of the stability and cold property of Soma guna, these help in the sustenance of life (Sushruta Sharira 6/16) (1). Vaikalyakara marma may also sometimes lead to

death if these are heavily injured (Sushruta Sharira 6/23) (1). These are forty four in number (Sushruta Sharira 6/8) (1). If an injury occurs at the border or nearby area of the location of Vaikalyakara marma, it harms the body after some time and also produces pain, i.e. the effect is similar to that of Rujakara marma (Sushruta Sharira 6/22) (1).

Rujakara marma predominantly have the properties of fire and air, both of which produce pain (Sushruta Sharira 6/16) (1). Although Agni is diminished because of trauma, yet Vayu causes constant pain at the affected part. These are eight in number (Sushruta Sharira 6/8) (1). If an injury occurs at the border or nearby area of the location of Rujakara marma, it causes severe pain (Sushruta Sharira 6/22) (1).

Location, Anatomical Correlation, Size and Number of Marmas

With reference to the above mentioned details about Marmas, in modern times, several studies have acknowledged the importance of Marmas (53-60), and several others have been conducted with regards to studying / ascertaining the location, anatomy, size, and other properties of the Marmas (17,19,20,27-33,35,61-68).

Table 5 to Table 10 give the location, anatomical correlation with modern science, size and number of Marmas of different parts of the body, i.e. Upper Extremities, Lower Extremities, Abdomen, Thorax, Back, and Supraclavicular region, respectively (3,7,10). Figure 1 gives the location and size of individual Marmas in the Shadanga Sharira (entire body) (35).

Marmas of Upper Extremities (22 in number)					
S.	Marma	Location (1,3,10)	Anatomical Correlation (3)	Size (1)	No.
1	Talahridaya	In the palm's center, in line of middle finger, just below 3 rd metacarpo-phalangeal joint	Palmer Aponeurosis	1/2finger	2
2	Kshipra	Between index finger and thumb	1 st Inter Metacarpal Ligament	1/2finger	2
3	Kurcha	From thumb's base, 1 finger above (proximal)	Carpometacarpal & Intercarpal Ligament 1 palm		2
4	Kurchashira	1 finger below Kurcha, below wrist joint	Lateral Ligament of Wrist Joint	1 finger	2
5	Manibandha	On top of the wrist	Wrist Joint	2 finger	2
6	Indravasti	In the mid-line of hand, 4 finger below elbow crease	Origin of Palmer Longus Muscle	1/2finger	2
7	Kurpara	On the either side of the elbow joint	Elbow Joint	3 finger	2
8	Ani	Just medial to mid-line of the hand, 3 fingers above elbow joint	Tendon of Bicep Muscle	1/2finger	2
9	Urvi	4 fingers above Ani, in mid of arm	Brachial Artery	1 finger	2
10	Lohitaksha	Medial to mid-line of hand, over anterior axillary fold	Brachial Plexus	1/2finger	2
11	Kakshadhara	Below lateral 1/3 rd of clavicle and medial to head of humerus, in delto-pectoral groove	Axillary Vessels	1 finger	2

Table 5. Location, anatomical correlation, size and number of Marmas of Upper Extremities.

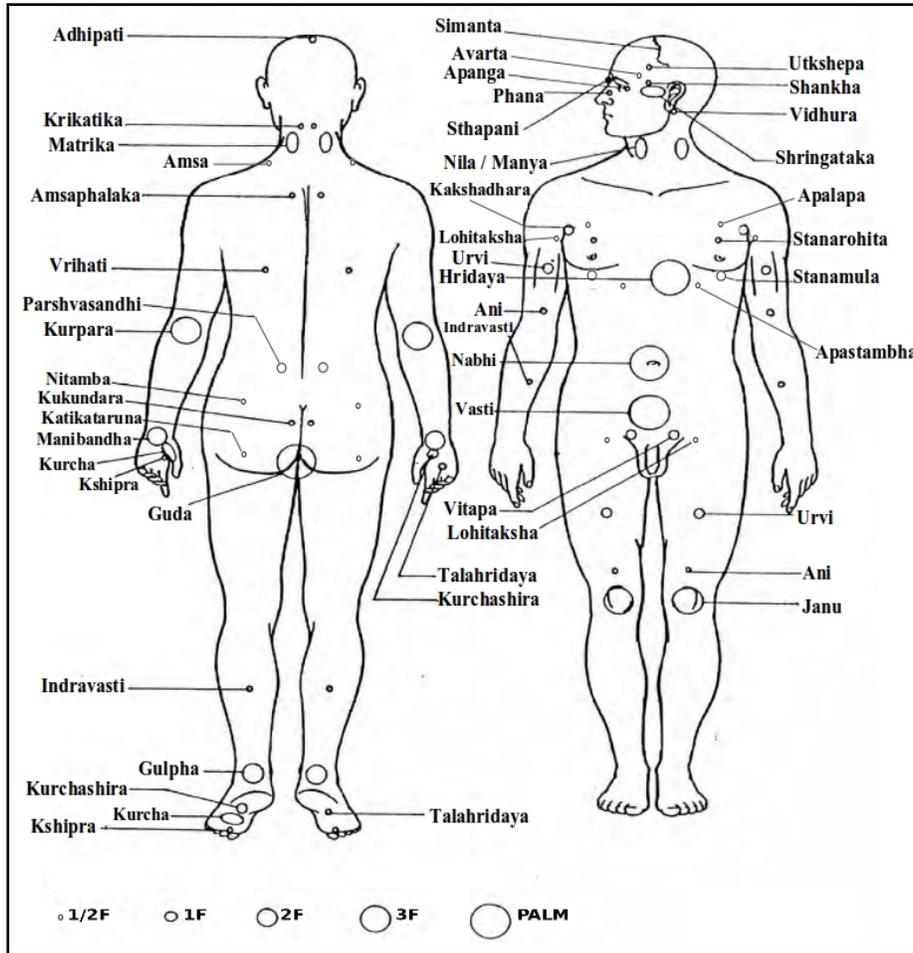


Figure 1. Location and size of individual Marmas in the Shadanga Sharira (entire body) (Courtesy Fedorova, 1990 (35)). 1/2F means half finger size, 1F means one finger size, 2F means two finger size, 3F means three finger size, and PALM means one palm or one fist size.

Marmas of Lower Extremities (22 in number)					
S.	Marma	Location (1,3,10)	Anatomical Correlation (3)	Size (1)	No.
1	Talahridaya	6 fingers proximal to 3 rd toe, center of sole	1 st Inter Metatarsal Ligament	1/2finger	2
2	Kshipra	Between 2 nd toe and big toe (in the web)	Long Planter Ligament	1/2finger	2
3	Kurcha	About 1 finger proximal to metatarso-phalayngeal joint of big toe, over the sole	Tarsometatarsal & Intertarsal Ligament	1 palm	2
4	Kurchashira	On either side (medial and lateral) over the heel, below ankle joint	Lateral Ligament of the Ankle Joint	1 finger	2
5	Gulpha	Ankle joint	Ankle joint	2 finger	2
6	Indravasti	In the mid-line, between 2 bellies of gastrocnemius muscle - lower leg's center	Calf Muscles	1/2finger	2
7	Janu	Knee joint	Knee joint	3 finger	2
8	Ani	3 fingers above knee joint - upper leg's lower part	Tendon of Quadriceps Femoris	1/2finger	2
9	Urvi	Upper thigh's mid region	Femoral Vessels	1 finger	2
10	Lohitaksha	Leg's upper part - below inguinal canal	Iliac Vessels	1/2finger	2
11	Vitapa	Between testicles and inguinal canal	Inguinal Ligament	1 finger	2

Table 6. Location, anatomical correlation, size and number of Marmas of Lower Extremities.

Marmas of Abdomen (3 in number)					
S.	Marma	Location (1,3,10)	Anatomical Correlation(3)	Size(1)	No.
1	Guda	Anus and the area surrounding it	Anal Canal and Anus	1 palm	1
2	Vasti	In lower abdomen area - behind and above pubic symphysis	Urinary Bladder	1 palm	1
3	Nabhi	In and around navel	Umblicus	1 palm	1

Table 7. Location, anatomical correlation, size and number of Marmas of Abdomen.

Marmas of Thorax (9 in number)					
S.	Marma	Location (1,3,10)	Anatomical Correlation (3)	Size(1)	No.
1	Hridaya	In thoracic cage's middle area, slightly to the left	Heart	1 fist	1
2	Stanamula	2 finger below nipples' level (at about 6 th intercostal space)	Internal Mammary Vessels	1 finger	2
3	Stanarohita	Breast's upper region (at about 2 nd - 3 rd intercostal space)	Lower Part of Pectoralis Major Muscle	1/2finger	2
4	Apalapa	On top of flanks and below shoulder joint	Lateral Thoracic and Subscapular Vessel	1/2finger	2
5	Apastambha	On either side of sternum, at 2 nd intercostal space	Two Bronchi	1/2finger	2

Table 8. Location, anatomical correlation, size and number of Marmas of Thorax.

Marmas of Back (14 in number)					
S.	Marma	Location (1,3,10)	Anatomical Correlation (3)	Size (1)	No.
1	Amsa	On top of back, between arm and neck - vertically parallel to either sacro-iliac(SI) joint	Coraco-humoral, Gleno-humoral Ligament, Trapezius Muscle	1/2 finger	2
2	Amsaphalaka	Shoulder blade - just medial to scapular spine's root	Scapular Spine	1/2 finger	2
3	Vrihati	In line with either sacro-iliac(SI) joint - just above the level of scapula's inferior angle	Subscapular and Transverse Cervical Arteries	1/2 finger	2
4	Parshvasandhi	Below the 12 th rib's inferior border, between flanks and buttock, at Renal angle	Common Iliac Vessels / Renal Angles	1 finger	2
5	Nitamba	Buttock's upper region	Ischial Tuberosity	1/2 finger	2
6	Kukundara	On lower iliac spine's either side	Sacroiliac Joint	1/2 finger	2
7	Katikataruna	Over the line joining ischial tuberosity and femur's greater trochanter	Sciatic Notch	1/2 finger	2

Table 9. Location, anatomical correlation, size and number of Marmas of Back.

Marmaghata (Injury to the Marma Points)

As described earlier, injury to the Marma points, i.e. Marmaghata, can lead to severe pain, loss of sensation, loss of function, disability, and death. A significant portion of Shalya Tantra (science of surgery) deals with the knowledge of the fatal spots

(marmas), because any injury to these fatal spots leads to sudden death, and if anyone survives due to the efficiency of the physician, the occurrence of deformities is almost a certainty (Sushruta Sharira 6/33) (1).

Marmas of Supraclavicular region (37 in number)					
S.	Marma	Location (1,3,10)	Anatomical Correlation (3)	Size (1)	No.
1	Nila	Just lateral to trachea - at throat's base	Right and Left Common Carotid Artery	1 palm	2
2	Manya	About 1/2 finger downwards and posterior to angle of mandible - side of upper neck	Right Sub-clavian Artery and Internal Jugular Veins	1 palm	2
3	Matrika	neck's both sides	Blood Vessels of the Neck	1 palm	8
4	Krikatika	Joint of neck and head - just on occipital protuberance's inferior part	Atlanto Occipital Articulation	1/2finger	2
5	Vidhura	Below and at the back of ears	Posterior Auricular Ligament	1/2finger	2
6	Phana	Ala nasi's either side	Kiesselbach's Plexus in Little's Area of Nose	1/2finger	2
7.	Apanga	Eyes' outer corner	Zygomatico-temporal Vessels	1/2finger	2
8.	Avarta	At eyebrows' center - in orbital cavity's upper border	Junction of Frontal, Molar & Sphenoid Bone	1/2finger	2
9.	Utkshepa	At hairline's border - above the temples	Temporal Muscles and Fascia	1/2finger	2
10.	Shankha	On top of temples	Temples	1/2finger	2
11.	Sthapani	On front of forehead - between the eyebrows	Nasal Arch of the Frontal Vein	1/2finger	1
12.	Shringataka	At the Center of confluence of veins that supply nourishment to eyes, ears, nose and tongue	Cavernous and Inter-cavernous sinuses	1 palm	4
13.	Simanta	Fissure on skull	Cranial Sutures	1 palm	5
14.	Adhipati	Top of head	Torcular Harophili	1/2finger	1

Table 10. Location, anatomical correlation, size & number of Marmas of Supraclavicular region.

Common symptoms of Marmaghata

According to Acharya Sushruta (Sushruta Sutra 25/34-35) (1), the common symptoms of Marmaghata are as follows:

भ्रमः प्रलापः पतनं प्रमोहो विचेष्टनं संलयनोष्णते च।
 स्रस्तान्गता मूर्च्छनमूर्ध्वास्तीव्रा रुजो वातकृताश्च तास्ताः॥
 मांसोदकाभं रुधिरन्व गच्छेत् सर्वेन्द्रियार्थो परमस्तथैव।
 दशार्धसंख्येष्वपि हि क्षतेषु सामान्यतो मर्मसु लिंगमुक्तम्॥

(Sushruta Sutra 25/34-35) (1)

- Bhrama (Giddiness)
- Pralapa (Delirium)
- Patana (Fainting)
- Pramoha (Delusion)
- Vicheshtana (Loss of activity of the body parts)
- Sanlayana (Semi- consciousness)
- Ushnataa (Increase of body temperature)
- Srastaangataa (weakness of body parts)

- Murchha (Fainting)
- Urdhwavata (Increased expiration)
- Vatastivra ruja (Severe pain caused by Vata)
- Mansadokabham rudhiram cha gachchheta (Flowing out blood resembling meat washed fluid)
- Sarvendriyaarthoparamastathaiva (Cessation of activity of all sense organs) are the common symptoms when all the five vital spots (mansa, sira, snayu, asthi, sandhi) are injured.

Symptoms of Marma Kshata/ Marma Viddha

Table 11 lists the symptoms of Marma Kshata / Marma Viddha (injury or piercing of Marma point) according to Acharya Sushruta (Sushruta Sutra 25/36-40) (1) and Acharya Vagbhatta (Ashtanga Hridaya Sharira 4/47-51) (2). Table 12 lists the symptoms of Marmaghata according to the vulnerability of Marmas.

S.	Type of Marma	No.	Name of Marmas	Marma Viddha lakshanas (Acharya Sushruta) (Sushruta Sutra 25/36-40) (1)	Marma Viddha lakshanas (Acharya Vagbhatta) (Ashtanga Hridaya Sharira 4/47-51) (2)
1	Mamsa Marma	10	Talahridaya, Indravasti, Stanarohita	Loss of touch sensation, Vipaandutaa (profound yellowish white color of body)	Continuous bleeding, blood resembles meat washed water, consistency of blood is thin, pandu, loss of function of sense organs, causes immediate death
2	Sira Marma	37	Urvi, Lohitaksha, Vitapa, Kakshadhara, Nabhi, Hridaya, Stanamula, Apalapa, Parshvasandhi, Vrihati, Nila, Manya, Matrika, Phana, Sthapani	Intense bleeding from the wound, color of blood resembles indragopa (bright red colored conchial insect), Vata gets aggravated and causes many diseases	Thick blood flows out continuously and in large quantity, thirst, dizziness, breathlessness, delirium, hiccough and ultimately leads to death
3	Snayu Marma	23	Kurcha, Kurchsira, Kshipra, Ani, Vasti, Ansa, Apanga, Utkshepa	Shortening, debility of body parts, that become unable to perform their actions, excruciating pain, wound healing takes longer time	Ayama (distension), Akshepaka (convulsions), Jadata (stiffness), severe pain, inability to sit, stand, ride etc., causes distortions or even death
4	Sandhi Marma	20	Gulpha, Janu, Manibandha, Kurpara, Krikatika, Kukundara, Avarta, Simanta, Adhipati	profuse swelling, severe pain, loss of strength of joints, splitting pain, oedema, and loss of function of joints	The site of injury feels like full of thorns, even after healing of the wound there is shortening of limb, lameness, diminution of strength and movement, atrophy, swelling of joints
5	Asthi Marma	08	Katikataruna, Nitamba, Ansaphalaka, Shankha	Severe and constant pain during day and night, finds no comfort in any posture, thirst, body weakness, oedema, pain	Intermittent discharge of clear fluid mixed with majja, associated with pain
6	Dhamani Marma	09	Guda, Apastambha, Vidhura, Shringataka	-----	Frothy and warm blood flows out with sound, person become unconscious

Table 11. Symptoms of Marma Kshata / Marma Viddha according to Acharya Sushruta (1) and Acharya Vagbhatta (2).

S	Type of Marma	No.	Trigunas	Bhutas	Prognosis/ Symptom of Marmaghata (Sushruta Sharira 6/36-40) (1) and (Ashtanga Hridaya Sharira 4/52-58) (2)
1	Sadyah Pranahara	19	Rajas & Sattva	Agni (fire)	Loss of sensory perception, abnormalities of mind and intellect, different kinds of severe pain. Immediate death within seven days. When injured, there is sudden depletion of Agni Guna.
2	Kalantara Pranahara	33	Rajas & Tamas	Agni (fire) & Soma (water)	Dhatukshya (loss or decrease of Dhatus), loss of consciousness. Death within fifteen or thirty days of injury. When injured, there is sudden depletion of Agni Guna, followed by gradual depletion of Soma Guna.
3	Vishalyaghna	03	Rajas	Vayu (air)	Vayu escapes when Shalya (foreign material) is removed and results in death. Vayu, mansa, vasa, majja and mastulunga are dried; shwasa, kasa develops and destroys the life of the person.
4	Vaikalyakara	44	Tamas	Soma (water)	Sthirattvam (stable) and Shaityam (cold) property of Soma leads to Pranavalambana (holds Prana - that is why it helps in sustenance of life), but results in deformity
5	Rujakara	08	Rajo bahulya	Vayu (air) + Agni (fire)	Any injury results in pain (Agni is Ashukari - quick acting, and Vayu produces pain)

Table 12. Symptoms of Marmaghata according to vulnerability of Marmas.

Specific Symptoms of Marmaghata for Individual Marmas

Table 13 gives the specific symptoms of Marmaghata for individual Marma points.

S	Marma	Effect of trauma	Resultant
1	Kshipra	Death due to convulsions	Delayed fatal
2	Talahridaya	Death due to severe pain	Delayed fatal
3	Kurcha	Wrist drop / Foot drop and tremors	Disabling
4	Kurchashira	Prain and swelling	Painful
5	Manibandha	Pain, wrist drop and deformity	Painful
6	Gulpha	Pain, restricted ankle movement and deformity	Painful
7	Indravasti	Excessive haemorrhage and death	Delayed fatal
8	Kurpara	Non- functioning and deformity of forearm	Disabling
9	Janu	Non- functioning and deformity of leg	Disabling
10	Ani	Excessive swelling and dysfunction of limb	Disabling
11	Urvi	Haemorrhage and atrophy of limb	Disabling
12	Lohitaksha	Excessive bleeding, paralysis and death	Disabling
13	Kakshadhara	Paralysis	Disabling
14	Vitapa	Impotency or decreased semen discharge	Disabling
15	Guda	Immediate death	Immediate fatal
16	Vasti	Immediate death	Immediate fatal
17	Nabhi	Immediate death	Immediate fatal
18	Hridaya	Immediate death	Immediate fatal
19	Stanarohita	Haemothorax, cough, breathlessness and death	Delayed fatal
20	Stanamula	Pleural effusion, cough, breathlessness and death	Delayed fatal
21	Apalapa	Pyemia, septicemia and death	Delayed fatal
22	Apastambha	Pneumothorax, cough, breathlessness and death	Delayed fatal
23	Katikataruna	Excessive haemorrhage, severe anaemia and death	Delayed fatal
24	Kukundara	Loss of sensation and locomotive activity	Disabling
25	Nitamba	Atrophy of lower limbs and death	Delayed fatal
26	Parshvasandhi	Renal injury, retroperitoneal haemorrhage & death	Delayed fatal
27	Vrihati	Haemorrhagic complications and death	Delayed fatal
28	Ansaphalaka	Numbness and paresis of upper limbs	Disabling
29	Ansa	Stiff shoulder	Disabling
30	Krikatika	Instability of head, continuous movement of head	Disabling
31	Nila	Aphonia, dysphonia and loss of taste	Disabling
32	Manya	Aphonia, dysphonia and loss of taste	Disabling
33	Matrika	Sudden death	Immediate fatal
34	Vidhura	Deafness	Disabling
35	Phana	Anosmia (loss of smell sensation)	Disabling
36	Apanga	Blindness or Diminution of vision	Disabling
37	Avarta	Blindness or Diminution of vision	Disabling
38	Utkshepa	Death, if foreign body removed	Fatal after removal of foreign body
39	Sankha	Sudden death	Immediate fatal
40	Sthapani	Death, if foreign body removed	Fatal after removal of foreign body
41	Simanta	Madness, phobia, chittanasha, death	Delayed fatal
42	Sringataka	Sudden death	Immediate fatal
43	Adhipati	Sudden death	Immediate fatal

Table 13. Specific symptoms of Marmaghata for Individual Marmas (Sushruta Sharira 6/25-28) (1) and (Ashtanga Hridaya Sharira 4/2-36) (2).

Symptoms caused by Marmaghata of Trimarmas

Table 14 lists the symptoms caused by Marmaghata of Trimarmas.

S	Marma	Symptom of Marmaghata (Charak Siddhi 9/6) (51)
1	Hridaya	Kasa (cough), shwasa (breathlessness), balakshya (debility), kanthashosh (dryness of throat), traction of kloma, mukhatalushosha (dryness of mucous membrane of oral cavity), jihwa nirgaman (protraction of tongue), different types of psychotic disorders like apasmara (epilepsy), unmada (insanity), pralapa (delirium), chittanasha (emptiness of mind), etc.
2	Shira	Manyastambha (neck stiffness), ardita (facial paralysis), chakshurvibhrama (rolling of eye balls), moha (mental confusion), uddveshtana (cramps), cheshtanasha (loss of movement), cough, shwasa (breathlessness), hanugraha (locked jaw), mooka (muteness), gadgadatva (stammering), akshinimilan (drooping of eyelids - ptosis), gandaspadana (quivering of cheeks), jrambha (yawning), lalashrava (salivation), swarahani (loss of voice), deformation of face, etc.
3	Vasti	Apanavayu-mutra-varchanigraha (retention of flatus, urine and faeces), vankshana - mehana-vasti shoola (pain in groin, penis and urinary bladder), kundala, udavarta, gulma, vatashthila, upastambha (stiffness), nabhikukshigudashronigraha (spasm in navel, lower abdomen, anus and hip region), etc.

Table 14. Symptoms caused by Marmaghata of Trimarmas

Samprapti of Marmabhighata

The Samprapti of Marmabhighata can be understood from the following flowchart (Figure 2) (Sushruta

Sharira 6/18-20) (1) and (Ashtanga Hridaya Sharira 4/64,65) (2).

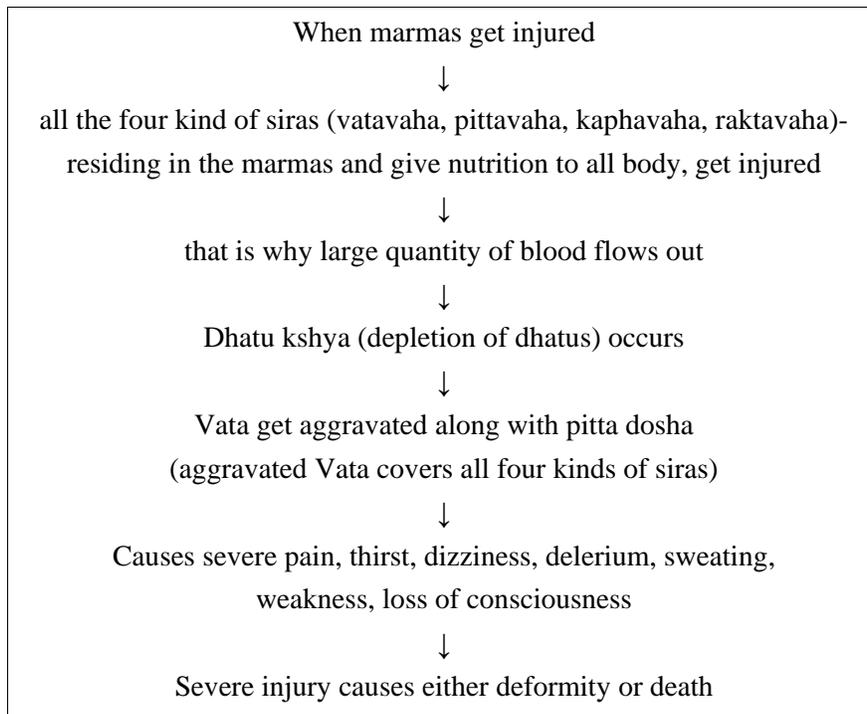


Figure 2. Samprapti of Marmabhighata.

Chikitsa of Marmabhighata

The chikitsa (treatment) of Marmabhighata is done in the following ways (Charaka Chikitsa 26) (51), (Sushruta Chikitsa 1, 2) (1):

- Lakshanika chikitsa (symptomatic treatment) according to marma viddha lakshanas
- Vata vyadhi chikitsa
- Judicial selection of Shashti upakrama, for vranopachara

Conclusion

The present article explored the foundational elements of the Science of Marma with regards to the number of marmas, their location, structures involved, correlation with Panchamahabhutas, classification, as well as a detailed explanation of marmaghata or viddha lakshanas (effect of trauma), as given in classical texts written during Samhita kala. The anatomical correlation with modern science has also been presented.

It is observed that the Marmas are of different sizes varying from ardha-anguli (half finger) to hatheli (palm). If injured, different Marmas lead to different kind of symptoms varying from pain to immediate death.

In such a case, several methodologies for the treatment of Marmabhighata have also been suggested in the scriptures. Thus, an in-depth knowledge about the properties of Marmas is available in the scriptures.

The Part-3 of the exploration of the Science of Marma will deal with the foundational elements and current status of Marma Therapy, which is a relatively recent application of this ancient science.

Compliance with ethical standards

The authors have maintained necessary ethical standards while conducting the study.

Conflict of interest

The authors declare that they have no conflict of interest.

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