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

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https://doi.org/10.36018/dsiij.v18i.155

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 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 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
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 Panchamahabhutas, 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-pranatyaage'. It means that which causes death or death like miseries.

**Shabdakalpadruma**

मृ + 'सत्वाधातुमयो 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 sandhisthanam (i.e. joining point of various structures) or jeevasthanam (seats of life) (38).

**Raj Nighantu**

मृ - मनिन्, जीव स्थाने: संधि स्थाने तात्पर्येऽऽ

(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 sandhisthanam (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

ममाणि मांससिरासन्यविद्याधिक्षणसन्निपतात:।
तेषु स्वभावत एवं विशेषज्ञ प्राणासिद्धत्ति।।
(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

तत्तु: मांससिरासन्यविद्याधिक्षणसन्निपतात:।
तेन तस्मिनु पीडुःपने विशेषत: प्राणबाध।।
(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

मांससिरासन्यविद्याधिक्षणसंसमाग:।
(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 Aruna Dutta

मरमाणि मांससिरासन्यविद्याधिक्षणसन्निपतात:।
तेषु स्वभावत एवं विशेषज्ञ प्राणासिद्धत्ति।।
(Ashtanga Hridaya Sharira, Aruna Dutta Tika 4/37) (47)

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

Lakshanas (Nature / Signs) of Marma

According to Acharya Sushruta

ममाणि मांससिरासन्यविद्याधिक्षणसन्निपतात:।
तेषु स्वभावत एवं विशेषज्ञ प्राणासिद्धत्ति।।
(Sushruta Sharira 6/15) (1)

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

धयष्‌मथण्डीिां समधिजक पीड़ा भवति, चेतनानिक्षिप्तेिोपात्।
(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

ममाणि जीवधाराणि प्रायेण मुण्यो 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

ममाणि तपुितहाणि प्राणां: खलु विशेषत्॥
(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 स्थाने: संधि स्थाने तात्त्यं 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 Vagbhatta

Acharya Vagbhatta 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).
Definition and Properties of Marma

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

| Urdhva Shakhagata (Upper limbs) (11X2) | Adho Shakhagata (Lower limbs) (11X2) | Udaragata (Abdomen) & Urogata (Thorax) (12) | Prishthagata (Back) (7X2) | Urdhwa-jatrughata (Supraclavicular region) (37) |
|--------------------------------------|-------------------------------------|---------------------------------------------|-----------------------------|-----------------------------------------------|
| Abdomen (3)                         | Thorax (9)                          | Neck (14)                                   | Head (23)                   |                                               |
| Talahridaya-2                       | Talahridaya-2                       | Guda-1                                      | Hridaya-1                   | Amsa-2                                        |
| Kshipra-2                           | Kshipra-2                           | Vastl-1                                     | Stanamula-2                 | Amsphalaka-2                                 |
| Kurcha-2                             | Kurcha-2                            | Nabi-1                                      | Stanarohita-2               | Vrihati-2                                     |
| Kurchashira-2                       | Kurchashira-2                       | Apalapa-2                                   | Parshvasandhi-2             | Krikatika-2                                   |
| Manibandha-2                        | Gulpha-2                            | Apastambha-2                                | Nitamba-2                   | Utkshepa-2                                    |
| Indravasti-2                        | Indravasti-2                        | Kukundara-2                                 |                             |                                               |
| Kurpara-2                           | Janu-2                              | Katikataruna-2                              |                             |                                               |
| Ani-2                                | Ani-2                               |                                             |                             |                                               |
| Urvi-2                               | Urvi-2                              |                                             |                             |                                               |
| Lohitaksha-2                         | Lohitaksha-2                        |                                             |                             |                                               |
| Kakshadhara-2                       | Vitapa-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 Vagbhatta (Ashtanga Hridaya, Sharira Sthana, Chapter 4) (2).

| *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)       | Krika (2)       |                   |                   |                  |
| Apalapa (2)       | Phana (2)       | Ansa (2)         | Simanta (5)     |                   |                   |                  |
| Apastambha(2)     | Sthapni (1)     | Basti (1)        | Adhipati (1)    |                   |                   |                  |
|                   | Utkshepa (2)    |                 |                 |                   |                   | Vidhura (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).
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)

| Eka anguli pramana (1 finger size) | Dwi anguli pramana (2 finger size) | Tri anguli pramana (3 finger size) | Eka hatheli/mushti pramana (1 palm/fist size) | Ardha-anguli pramana (Half finger size) |
|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------------------|---------------------------------------|
| Urvi (4)                          | Gulpha (2)                        | Janu (2)                          | Kurcha (4)                                    | Kshipra (4)                           |
| Kurchashira (4)                   | Manibandha (2)                    | Kurpara (2)                       | Guda (1)                                       | Talahridaya (4)                       |
| Vitapa (2)                        | Stanamula (2)                     |                                   | Vasti (1)                                     | Ansna (2)                             |
| Kakshadhara (2)                   |                                   |                                   |                                               |                                       |

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), Vishalyaghya (Fatal after removal of foreign material) (3), Vaikalyakara (Disabling) (44), and Rujakara (Painful) (8) (Sushruta Sharira, Chapter 6) (1).

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) 

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 Marmas
2) Saumyagneya (having fire & water qualities) (33) - these are Kalantar Pranahara Marmas
3) Vayavya (having air quality) (3) - these are Vishalyaghna Marmas
4) Saumaya (having water quality) (44) - these are Vaikalyakara Marmas
5) Vayavya (having air with little fire quality) (8) - these are Rujakara Marmas

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

1. The nature of Sadyah Pranahara marmas is Agneya, i.e. having qualities of fire; therefore, owing to this fire like (sharp) quality, injury to these marmas kills the affected person quickly (Sushruta Sharira 6/16) (1). The fatal time period of Sadyah Pranahara marmas is less than seven days (Sushruta Sharira 6/23) (1). These marmas 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 marmas, the occurrence of death is slightly delayed, i.e. the effect is similar to that of Kalantar Pranahara marmas (Sushruta Sharira 6/22) (1).

2. Vishalyaghna marmas are Vayavya, i.e. having qualities of air. If these marmas 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 marmas 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 marmas, the occurrence of death is slightly delayed, i.e. the effect is similar to that of Vishalyaghna marmas (Sushruta Sharira 6/22) (1).

3. Vaikalyakara marmas 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 marmas 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).

| S. No. | 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 3rd metacarpo-phalangeal joint | Palmer Aponeurosis                  | 1/2 finger | 2   |
| 2     | Kshipra     | Between index finger and thumb              | 1st Inter Metacarpal Ligament       | 1/2 finger | 2   |
| 3     | Kurcha      | From thumb's base, 1 finger above (proximal) | Carpmetacarpal & 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     | 1/2 finger | 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             | 1/2 finger | 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                   | 1/2 finger | 2   |
| 11    | Kakshadhara | Below lateral 1/3rd 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.
Definition and Properties of Marma

**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  | Talahirdaya | 6 fingers proximal to 3rd toe, center of sole                                     | 1st Inter Metatarsal Ligament               | 1/2finger      | 2   |
| 2  | Kshipra     | Between 2nd 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)

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

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

### Marmas of Thorax (9 in number)

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

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

### Marmas of Back (14 in number)

| No. | S. | Marma | Location (1,3,10) | Anatomical Correlation (3) | Size (1) | No. |
|-----|----|-------|-------------------|---------------------------|---------|-----|
| 1   | 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   | 2  | Amsaphalaka | Shoulder blade - just medial to scapular spine's root | Scapular Spine | 1/2 finger | 2   |
| 3   | 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   | 4  | Parshvasandhi | Below the 12” rib's inferior border, between flanks and buttock, at Renal angle | Common Iliac Vessels / Renal Angles | 1 finger | 2   |
| 5   | 5  | Nitamba | Buttock's upper region | Ischial Tuberosity | 1/2 finger | 2   |
| 6   | 6  | Kukundara | On lower iliac spine's either side | Sacroiliac Joint | 1/2 finger | 2   |
| 7   | 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).
### Definition and Properties of Marma

**Marmas of Supraclavicular region (37 in number)**

| No. | 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 | 1/2 finger  | 2   |
| 5   | Vidhura | Below and at the back of ears               | Posterior Auricular Ligament | 1/2 finger  | 2   |
| 6   | Phana   | Ala nasi’s either side                      | Kiesselbach’s Plexus in Little’s Area of Nose | 1/2 finger  | 2   |
| 7   | Apanga  | Eyes’ outer corner                          | Zygomatico-temporal Vessels  | 1/2 finger  | 2   |
| 8   | Avarta  | At eyebrows’ center - in orbital cavity’s upper border | Junction of Frontal, Molar & Sphenoid Bone | 1/2 finger  | 2   |
| 9   | Utkshepa| At hairline’s border - above the temples   | Temporal Muscles and Fascia  | 1/2 finger  | 2   |
| 10  | Shankha | On top of temples                           | Temples                     | 1/2 finger  | 2   |
| 11  | Shapami | On front of forehead - between the eyebrows| Nasal Arch of the Frontal Vein  | 1/2 finger  | 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          | 1/2 finger  | 1   |

**Common symptoms of Marmaghata**

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

आहारार्थक Blades: तन्मया सामान्ते सर्वं हिंसुः 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)
- Vatativra 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, Kakshadhrara, Nabhi, Hridaya, Stanamula, Apalapa, Parshvasandhi, Vihati, Niila, 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, Apana, 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, Avara, 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, Nithamba, Anshaphalaka, 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).
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 | Pain 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        | Haemorrhagic and atrophy of limb                      | Disabling       |
|12 | Lohitaksha  | Excessive bleeding, paralysis and death               | Disabling       |
|13 | Kakshadhara | Paralysis                                            | Disabling       |
|14 | Vihatia     | 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     | Pyaemia, 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 | Vrhati      | 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), chakshuribhrama (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), gandaspandana (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, vatasthila, upastambha (stiffness), nabhiukshigudashronigraha (spasm in navel, lower abdomen, anus and hip region), etc. |

Table 14. Symptoms caused by Marmaghata of Trimarmas

Samprapti of Marmabhughata

The Samprapti of Marmabhughata can be understood from the following flowchart (Figure 2) (Sushruta 6/18-20) (1) and (Ashtanga Hridaya Sharira 4/64,65) (2).

When marmas get injured ↓
all the four kind of siras (vatavaha, pittavaha, kaphavaha, raktavaha)- residing in the marmas and give nutrition to all body, get injured ↓
that is why large quantity of blood flows out ↓
Dhatu kshya (depletion of dhatus) occurs ↓
Vata get aggravated along with pitta dosha (aggravated Vata covers all four kinds of siras) ↓
Causes severe pain, thirst, dizziness, delerium, sweating, weakness, loss of consciousness ↓
Severe injury causes either deformity or death

Figure 2. Samprapti of Marmabhughata.
**Chikitsa of Marmabhigahata**

The chikitsa (treatment) of Marmabhigahata 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 Marmabhigahata 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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