

## AN ANATOMICAL STUDY OF INDRABASTI MARMA; ON BASIS OF CADAVERIC DISSECTION

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### ABSTRACT

*Ayurveda* is been practiced in India for at least 5000 years, but in present time it becoming more popular in whole world due to its holistic approach. Its acceptability has opened a new horizon which in turn has made it compulsion to explore the *Ayurvedic* theories on the basis of the concurrent knowledge in scientific terminology to further enhance its utility and acceptability. In the ancient time the knowledge of *Marma Vigyana* was used in various fields like martial art, surgery, for prognosis of diseases and also for the treatment. But in present scenario this knowledge is not practiced widely and it is conserved only in small ethnic group. So, it is necessary to explore this knowledge on the basis of modern medical science to contribute highest in this field.

### INTRODUCTION

*Ayurveda* is the treasure of knowledge which was developed and discovered by our great ancestors. To understand and to properly execute this knowledge we must have the knowledge of *Sharira*. *Marma* is the very important and interesting subject in *Sharira* which has great utility in the field of surgery and medicine. In ancient India this knowledge was used to treat different diseases, even soldiers were taught about *Marmas* science as martial art, *Kalari payatu* is one of them. Surgery is fastest growing medical science in present time. But it is also a fact that there are very much risk of failure and other complications, so we are looking for non-invasive technique like endoscopy and robotic surgery and in this situation the knowledge of *Marma* can be very handful because *Marma* is the seat of *prana*, so if any disease or trauma has involvement of any *Marma* then it will have more complications. *Acharya Susurta* also described in *Sharira Sthana* that if a person

has skull fracture and severe trauma on limbs and abdomen but has safe vital points (*Marma*), then his prognosis will be good<sup>1</sup>. Here in this study we will discuss about the *Indrabasti Marma*. According to text *Indrabasti Marma* is situated between elbow and wrist<sup>2</sup> (*PrakoshtaMadhya*). In Compositional point of view it is *Mamasa Marma*<sup>3</sup>, and according to time of mortality it is *kalantarapranhar Marma*<sup>4</sup>. An injury on the *Indrabasti Marma* can lead to death due to the excess bleeding<sup>5</sup>.

**Aims and objectives:** Aim of the study is to identify and determine the location, composition and traumatic effect of *Indrabasti Marma* of upper limb.

**Material and method:** Various books, journals, articles, Confirmed World Wide Web sources and literary works related to the subject were reviewed. One male and one female cadaver were dissected at the dissection hall of *Sharir Rachana* Department, NIA Jaipur. Dissection was done at the flexor region of forearm (anterior compartment of forearm) as per

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guideline given in the Cunningham's manual of practical anatomy<sup>6</sup> and Human anatomy by B.D. Chaurasia<sup>7</sup>. Photographs of this region were taken. Collected information from literature is compared and correlated with the finding from dissection and conclusions were made.

**Cadaveric study:** *Acharya Susruta* has mentioned process of dissection in detail and has also described the importance of dissection. Before treating a disease or performing a surgical procedure, physician must have complete theoretical and practical knowledge<sup>8</sup>. Location, type, magnitude and symptoms of injury of *marma* are described in classics, but with the help of cadaveric study we can determine the exact location of a *marma* and observe various anatomical structures related to *marma*.

1. **Muscles-** *Indrabasti Marma* belongs to *Mamsa marma* group and heap of muscles (Flexor carpi radialis muscle, Flexor digitorum superficialis muscle, Flexor digitorum profundus muscle, Pronator teres muscle, Brachioradialis muscle.) are present here.
2. **Ulnar artery-** The ulnar artery is larger terminal branch of the brachial artery. It begins in the cubital fossa at the level of the neck of radius it descends through the anterior compartment of the forearm and enters in the palm in front of the flexor retinaculum in company with the ulnar nerve. In the upper part of its course the ulnar artery lies deep to most of the flexor muscles. Below, it is superficial and lies between the tendon of the flexor carpi ulnaris (medial) and tendon of the flexor digitorum superficialis (lateral).

#### **Branches-**

**Muscular branches-**to neighbouring muscles.

**Recurrent branches-**These take part in arterial anastomosis around the elbow joint.

**Common interosseous artery-** It arises from the upper part of ulnar artery after a brief course divides into anterior and posterior interosseous artery.

**Anterior interosseous artery-** It is a small artery and arises from Common interosseous artery and passes downwards, with the anterior interosseous nerve on the front of the interosseous membrane. At the upper border of pronator quadratus, it pierces the interosseous membrane and descends behind it to take part in the arterial anastomosis around wrist joint.

**Posterior interosseous artery-** It also arises from common interosseous artery. It passes backwards above and upper margin of the interosseous membrane. It then passes downwards between the supinator and abductor pollicis longus and reaches the interval between the superficial and deep group of muscles. It ends by anastomosing with the anterior interosseous artery and taking part in arterial anastomosis around the wrist joint.

3. **Radial artery-** Radial artery is smaller terminal branch of brachial artery. It begins at cubital fossa at the level of the neck of the radius. It passes downwards and laterally, beneath the brachioradialis muscle and resting on the deep of the deep muscles of the forearm. In the middle third of its course, the superficial branch of the radial nerve lies on its lateral side. In the distal part of the forearm radial artery is subcutaneous and lies between tendon of brachioradialis and tendon of flexor carpi radialis. The radial artery leaves the forearm by winding around the lateral aspect of the wrist to reach the posterior surface of the hand.
4. **Median nerve-** Median nerve lies medial to the brachial artery, behind the bicipital aponeurosis in the cubital fossa. It enters the forearm by passing between the two heads of pronator teres. Here it is separated from ulnar artery by deep head of pronator teres. Median nerve then passes between the Flexor digitorum superficialis and Flexor digitorum profundus muscle. About 5 cm. above the flexor retinaculum, it becomes superficial and lies between

the tendons of the flexor carpi radialis(laterally) and Flexor digitorum superficialis(medially).median nerve enters the palm by passing deep to the flexor retinaculum through the carpal tunnel.

The cadaveric study has been done in dissection hall of Sharir Rachana Department, NIA Jaipur, regarding the cadaveric study of *Indrabasti marma* of upper limb in the male and female cadavers.

**Cadaver- Male, Approx age-55 to 60, Approx height-5.9 to 6feet**

**Cadaver- Female, Approx age-50 to 55, Approx height-5 to 5.2 feet**

**Observation-** as per classical description about *Indrabasti Marma* following inferences can be drawn-

1. Number- 4(both limbs)
9. .



**Figure no. 1: Structures found at Indrabasti marma**

### DISCUSSION

*Marmas* are the vital points of our body and made from composition of *Mamsa*, *sira*, *snayu*, *asthi*, and *sandhi*<sup>9</sup>. *Indrabasti marma* is the variety of *Mamsa marma* and according to *Acharya Susruta* location of *Indrabasti marma* is situated between elbow and wrist (*Prakoshta Madhya*), slightly towards the hand. Part of forearm which is situated between elbow and wrist is called *Prakoshta*. Normally the length of adult *Prakoshta* is approx 16 *angula*<sup>10</sup> (40 cm.). Location of *Indrabasti marma* is “*Prakoshta madhya prati*” so it will be present 8 *angula* (20 cm.) cm. from elbow to wrist. If we are looking at the surface anatomy of the

2. Type- *Mamsa Marma*, *kalantara pranhar Marma*, *shakhagata*,
3. Location- between elbow and wrist (*PrakoshtaMadhya*)
4. Dimension- 1\2 *angula*
5. *Viddha lakshana-* *Shonita Kshyena Marnam*

6. *Mahabhoot pradhanya-* *Jal* and *Agni*  
**On cadaveric dissection following structures are observed in this region-**

1. Interossious branches of ulnar artery.
2. Radial artery.
3. Median nerve and its branches.
4. Flexor carpi radialis muscle.
5. Flexor digitorum superficialis muscle.
6. Flexor digitorum profundus muscle.
7. Pronator teres muscle
8. Brachioradialis muscle



**Figure no. 2:location of Indrabasti marma**

*Indrabasti marma* then we found it is right to be classified into *mamsa marma* because middle of forearm pronator teres, brachioradialis, flexor carpi radialis and flexor digitorum superficialis muscles are present at this region. Beneath these muscular layers, ulnar artery and its branches, radial artery and median nerve are also present. As *Acharya Susruta* mentioned, that injury to the *Indrabasti marama* causes death due to excessive blood loss. These arteries can be injured more often due to the laceration and less commonly, fracture of the shaft of radius and ulna. These fractures results blood loss into the surrounding tissues. This excessive blood loss and pain

may lead to the shock and death. This loss of the blood supply in injuries which involve high amount of damage of soft tissue, bone, vessels and nerves can be indication for amputation. Amputation is more common with the arterial injury at the forearm level in the upper extremity<sup>11</sup>. Acharya Susruta considers *Indrabasti marma* as *kalantar pranhar marma*. It has *saumya* and *agneya* property. So, injury on *Indrabasti marma* doesn't cause sudden death but if these injuries not given proper treatment then due to blood loss, shock may occur which may ultimately lead to death.

### CONCLUSION

The conclusion has been made on basis of conceptual and cadaveric study-

1. *Indrabasti Marma* that it is "*Prakoshta Madhya Prati*" so, it will be present 20 cm. from elbow to wrist
2. According to structural classification, it is the type of *Mamsa marma* namely muscles like- Flexor carpi radialis muscle, Flexor digitorum superficialis muscle, Flexor digitorum profundus muscle, Pronator teres muscle, Brachioradialis muscle are found.
3. Interossious branches of ulnar artery, Radial artery and its branches are found in the proximity of Marma, so source of bleeding as a *Viddha lakshan* of this *marma* can be from these vessels, especially on any lacerating injury, which can causing profuse bleeding and can cause death due to hypovolumic shock.

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