



## Research Article

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### A CADAVERIC STUDY OF SEEMANTA MARMA

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#### ABSTRACT

**Background:** The marma sharira is a prime territory of Rachana sharira. Sushruta had elaborated marma sharira at a certain depth. Marma (vital area) is described in the Hindu scripture Atharva Veda. During the Vedic era, the Marma Sharira had particular importance in the case of war field. The seemanta marma is shira marma, kalantara pranahara. The nature of this marma is sandhi marma. **Aims:** There are very few studies regarding the cadaveric study of seemanta marma. This study aims to identify the possible anatomical structure and analyze those structures. Perhaps it could be helpful for future scholars of Ayurveda. **Material and method:** The review was performed based on traditional Ayurvedic classics and contemporary medical sciences, journals, publications, articles, e-journals etc. The region of seemanta marma and surrounding area was dissected, and complete anatomical study was done. **Discussion:** The term seemanta indicates that the bony joint is present in the skull region. The joints present in the skull region are mainly sutural joints and fibrous, which provide malleable head quality. There are five major sutures in adult like coronal suture, sagittal suture, lambdoid suture and two squamous sutures, the frontal sutures present in infant and children. **Conclusion:** It has a significant role during delivery and brain development, which allows normal vaginal birth of the head. It also offers normal cranial growth by proper fusion if the premature fusion of sutures occurs (craniosynostosis), which results in cranial malformation.

**Keywords:** Marma, Seemanta marma, Kalantara pranahara marma, Skull, Cranial sutures

#### INTRODUCTION

Ayurveda is traced back to Vedic time, about 5000. B.C. and is widely practiced. The primary aim of Ayurveda is to maintain the health of a healthy person, and the secondary objective is the treatment of the disease. Marma sharira has particular importance on Sharira sthana and in Shalya tantra. There are 107 Marma present in the human body, which is categorized differently. Each marma is composed of panchamahabhuta.

The Seemanta Marma is situated overhead, which is kalantara pranahara marma, five in number. There is 33 Kalantara pranahara marma present; injuries to these marma leads to death within two weeks to one month.<sup>1</sup> The seemanta Marma also has surgical importance.

**Aims and objectives:** To assess the location and structural composition of seemanta marma.

#### MATERIAL AND METHODS

**Literary study:** Classical textbooks of Ayurveda and contemporary science, journals, publications, articles, e-journals etc.

**Observational study:** Dissection was performed in the Gangasheel Ayurvedic Medical College and Hospital, Bareilly, Uttar Pradesh, India. The region of seemanta marma and surrounding area was dissected, and complete anatomical study was done. The study was performed on preserved cadaver as per institution guidelines.

**Assessment Criteria:** Based on cadaveric dissection, the surface and regional anatomy of the seemanta marma (around the skull region) was determined. With the help of literary and observational studies, the location and anatomical structure of seemanta marma were approximated.

#### REVIEW OF LITERATURE

##### Classical review of Seemanta Marma

Seemanta is also known as asthi sanghata<sup>2</sup>, which is 14 in number; only five are present in shira.<sup>3</sup> The seemanta marma, which is present in shira, also five in number and also Sandhi marma (Table 1).

The skull contains a sizeable cranial cavity in which the brain is situated. The skull consists of many bones firmly joined together by sutures.<sup>7</sup> These bones form the cranium. It consists of two parts - the upper and posterior parts containing the cranial cavity and anterior and inferior parts forming the face's skeleton. The suture is a syndesmosis fibrous joint with minimal blood supply. The sutures are twisted spiral lines that help to interlock the juxtaposed bones, increasing protection for the enclosed brain. In newborns, the suture sites are widely separated by wide fibrous areas to allow the mobility and approximation of the bones.

#### OBSERVATION AND DISCUSSION

After removing the thick skin of the scalp, other layers of skin were also removed (Figure 1). In the skull, as seen from above, four bones were seen. The frontal bone formed the anterior part of the vault of the skull. The right and left parietal bones to create a significant part of the roof and side walls of the cranial cavity.

The occipital bone forms the posterior part of the vault of the skull.

There are three sutures joined to these four bones. The sagittal suture joined two parietal bones at the midline. A coronal suture joined the frontal bone with the parietal bone. An inverted 'Y' shaped lambdoid suture joined occipital bone with parietal bone. In the skull, as seen from the lateral side, the temporal bone was joined with the parietal bone by a squamous suture (Figure 2).

The skull consists of 28 bones; out of 28 bones, 22 are paired and 6 bones are unpaired. Paired bones are – parietal, temporal, maxilla, zygomatic, nasal, lacrimal, palatine, and inferior nasal concha, malleus, incus, and stapes. The unpaired bones are frontal, occipital, sphenoid, ethmoid, mandible, and vomer.

These bones are joined with each other's by multiple sutures, some are large, and some are small. The large sutures are frontal, coronal, sagittal, lambdoid, squamous.<sup>8</sup> The small sutures are frontozygomatic, frontomaxillary, frontonasal, internasal, nasomaxillary, intermaxillary, zygomaticomaxillary etc.

The frontal suture is also known as a metopic suture (Figure 3), which is present during the fetal and infantile periods of life. The suture divides the frontal bone into right and left frontal halves.

Its persistence is variable, very rarely present in adulthood. It usually disappears within the first to the second year of life but can persist for up to 7 years.<sup>9</sup> The word "corona" means a crown, which is easily palpable throughout the scalp. The point of meeting the coronal suture with the sagittal suture is known as the bregma.<sup>10</sup> The coronal suture lies about 12 cm from the nasion, and the point of drainage is 3 cm lateral to the midline.<sup>11</sup>

The sagittal sutures are situated at the mid sagittal line, which extends from bregma to lambda. The suture is about 5.0 mm wide in newborns but diminishes progressively to close completely at the age of 21 to 30 years. The fusion of this suture started from lambda towards the anteriorly.<sup>12</sup> Lambdoid is derived from the Greek letter "lambda" (Λ). The lambdoid suture joins the occipital bone with two parietal bones. The area where lambdoid and sagittal suture are joined together is known as lambda.<sup>13</sup>

The squamous sutures (Figure 3) join the squamous part of the temporal bone to the parietal bone above and the greater wing of the sphenoid anteriorly on the lateral side of the skull. It has two parts: the temporosquamosal suture (horizontal) and sphenosquamosal suture (vertically). The squamous suture is used as a surgical landmark for approaches to the middle cranial fossa in craniotomy, especially for the mastoid antrum.<sup>14</sup>

Table 1: Features of Seemanta Marma

| Features              | Details  |
|-----------------------|--|
| Location              | Urdhwajatru gata marma   |
| Number                | 5  |
| Measurement           | One mustiparimita (fist) <sup>4</sup>  |
| Predominant structure | Sandhi marma   |
| Traumatic effect      | Death due to unmad (insane), bhita (fear), chittanasha (psychological disturbance). <sup>5</sup> |
| Prognosis             | Kalantara pranahara <sup>6</sup>   |



Figure 1: Layers of scalp

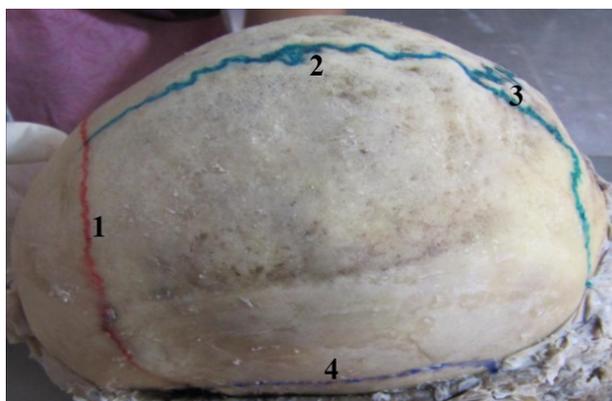


Figure 2: Sutures of Skull

1. Coronal Sutures, 2. Sagittal Suture, 3. Lambdoid Suture, 4. Squamous Suture

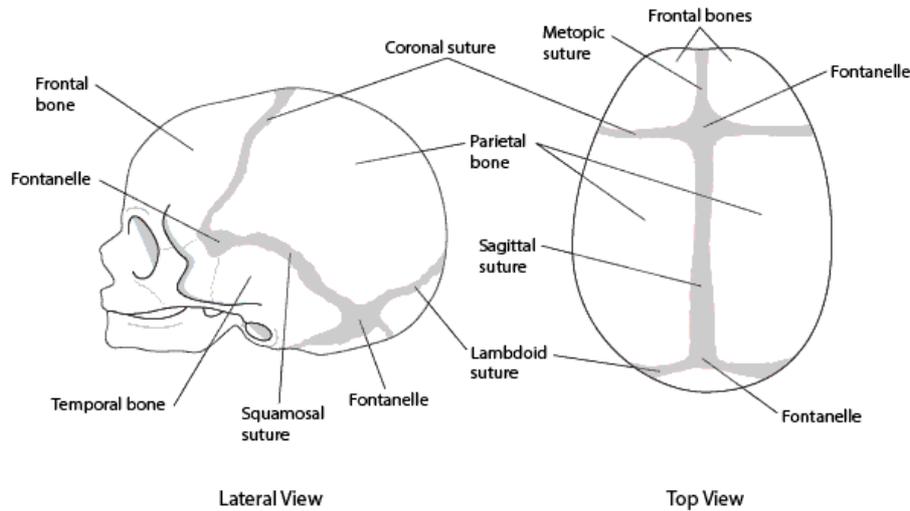


Figure 3: Superior and lateral view of skull (picture courtesy – radiologykey.com<sup>15</sup>)

## CONCLUSION

The seemanta marma, situated in shira (skull) region, measures about one mustiparimita (one fist). So, based on the literature review and cadaveric observation, the location of seemanta marma can be determined over skull bones. It is sandhi marma and five in number. The skull bones contain multiple sutures, but there are significant or primary sutures that can be correlated with seemanta marma, which are coronal suture, sagittal suture, lambdoid suture and two squamous sutures. The Cranial sutures provide a malleable quality to the head; allow vaginal birth and growth of the brain during the early developmental period.

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