



Review Article

AN ANATOMICAL AND RADIOLOGICAL CORRELATION OF *SIROGATA MARMA* WITH CRANIAL NEUROVASCULAR STRUCTURES

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Article info

Article History:

Received: 08-06-2026

Accepted: 11-07-2026

Published: 10-09-2026

KEYWORDS:

Shirogata Marma,
Neurovascular
structures, Cranial
anatomy,
Radiological
correlation,
Ayurveda.

ABSTRACT

Marma are described in Ayurveda as anatomically significant and clinically sensitive regions where injury may produce severe functional disturbances. Among them, *Shirogata Marma* are situated in the cranial region and are closely related to important neurovascular structures. **Objective:** To explore the anatomical and radiological correlation between *Shirogata Marma* and major cranial neurovascular structures using classical Ayurvedic concepts and contemporary anatomy. **Materials and Methods:** A descriptive analytical review was carried out using classical Ayurvedic literature, standard anatomical textbooks, and radiological references. The location of selected *Shirogata Marma* was identified according to Ayurvedic descriptions and correlated with modern surface anatomy, computed tomography, and magnetic resonance imaging landmarks. **Results:** *Shankha Marma* showed close association with the pterion and the course of the middle meningeal artery. *Shrngataka Marma* demonstrated correlation with the cavernous sinus and adjoining cranial nerves. *Adhipati Marma* corresponded to the vertex region related to the superior sagittal sinus. Most cranial *Marma* were observed in areas containing dense neurovascular networks. **Conclusion:** The findings indicate a significant relationship between *Shirogata Marma* and critical cranial neurovascular structures. Understanding these correlations may contribute to anatomical interpretation, surgical awareness, and integrative clinical research.

INTRODUCTION

Ayurveda describes *Marma* as vital anatomical sites where muscles, vessels, ligaments, bones, and joints intersect. Trauma to these areas is believed to produce pain, deformity, disability, or even fatal consequences depending upon the severity of injury. *Shirogata Marma* are the *Marma* located in the cranial region and hold special clinical importance due to the concentration of essential neurological and vascular structures.

Modern anatomical science recognizes several cranial regions as surgically sensitive because of the presence of major arteries, venous sinuses, and cranial nerves.

Correlating classical *Marma* descriptions with contemporary anatomy can provide a scientific understanding of these traditional concepts. Radiological imaging further assists in identifying the precise anatomical relations of these structures.

The present work attempts to establish a structured anatomical and radiological interpretation of *Shirogata Marma* with reference to clinically relevant cranial neurovascular structures.

AIM

To study the anatomical and radiological correlation of *Shirogata Marma* with cranial neurovascular structures.

OBJECTIVES

- To identify the anatomical location of selected *Shirogata Marma*.
- To correlate classical *Marma* descriptions with modern cranial anatomy.
- To analyze associated neurovascular structures using radiological references.

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<https://doi.org/10.47070/ayushdhara.v13i4.2685>

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- To evaluate the possible clinical significance of these correlations.

MATERIALS AND METHODS

Study Design: Descriptive analytical study.

Data Sources: Classical Ayurvedic texts including Sushruta Samhita, standard anatomy textbooks, peer-reviewed articles, and radiological references were reviewed.

Methodology: Selected *Shirogata Marma* were identified according to their classical descriptions.

OBSERVATIONS

<i>Shirogata Marma</i>	Modern anatomical correlation	Associated Neurovascular Structures
<i>Shankha Marma</i>	Pterion region	Middle meningeal artery
<i>Shrngataka Marma</i>	Cavernous sinus region	ICA, CN III, IV, V1, V2, VI
<i>Adhipati Marma</i>	Vertex region	Superior sagittal sinus
<i>Utkshepa Marma</i>	Temporal region	Superficial temporal vessels

DISCUSSION

The present study demonstrates that the majority of *Shirogata Marma* correspond to regions containing critical neurovascular structures. The correlation of *Shankha Marma* with the pterion is clinically important because fractures in this area may damage the middle meningeal artery and lead to extradural hemorrhage. Similarly, the relation of *Shrngataka Marma* with the cavernous sinus region explains the severe consequences associated with injury to this site due to the presence of multiple cranial nerves and vascular channels.

Adhipati Marma was found to correspond to the cranial vertex overlying the superior sagittal sinus. This region is surgically significant because trauma may result in venous bleeding and intracranial complications. The study supports the view that classical Ayurvedic descriptions of Marma were based on careful anatomical observations and clinical experiences.

Radiological evaluation provides additional support by enabling visualization of deep neurovascular structures that cannot be assessed through surface anatomy alone.

Their anatomical location was compared with modern cranial landmarks. Correlation with neurovascular structures was carried out using anatomical descriptions and available CT and MRI references.

Parameters of Correlation

- Surface anatomical location
- Relation with arteries, veins, venous sinuses, and cranial nerves.
- Surgical and clinical significance

CONCLUSION

Shirogata Marma show close anatomical and radiological correlation with important cranial neurovascular structures. These findings support the clinical relevance of *Marma* described in Ayurveda and provide a bridge between classical concepts and contemporary anatomical science. Further cadaveric and radiological studies may strengthen the understanding of *Marma*-based clinical applications.

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Cite this article as:

Apoorva Jangir. An Anatomical and Radiological Correlation of Śirogata Marma with Cranial Neurovascular Structures. AYUSHDHARA, 2026;13(4):444-445.
<https://doi.org/10.47070/ayushdhara.v13i4.2685>

Source of support: Nil, Conflict of interest: None Declared

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