



Original Research Article

PHANA MARMA: INTEGRATING CLASSICAL AYURVEDIC KNOWLEDGE WITH MODERN CLINICAL ANATOMY

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Abstract: Marma are vital anatomical sites described in classical Ayurvedic literature, where trauma causes significant functional impairment¹. Phana Marma, a paired Sira Marma located in the nasal region, is classically associated with Gandha-agyana (loss of smell) when injured². Although classical texts provide limited structural description, the functional outcome strongly suggests involvement of the olfactory pathway³. Modern anatomical interpretation identifies a potential correlation with the olfactory region of the nasal cavity, particularly the cribriform plate of the ethmoid bone, through which olfactory nerve fibres pass to the olfactory bulb^{3, 4}. Trauma to this region may disrupt these delicate fibres, leading to anosmia⁵. Although all the scholars of Sharir considered the cribriform plate as the interpretation of Phana Marma¹⁸, it still raises the question of how a bony tissue is responsible for sensory loss. Based on the above narration, this article reviews the classical Ayurvedic description of Phana Marma and explores its modern anatomical correlation, emphasizing the interaction between asthi and sira in Marma pathology^{3, 11}.

Keywords: Marma, Sira, Asthi, Olfactory nerve fibres, Cribriform plate, Anosmia

INTRODUCTION

Marma sthana form an essential part of Ayurvedic anatomical knowledge. Classical texts describe 107

Marma, representing sites where *mamsa* (muscle), *sira* (vessels or nerves), *snayu* (ligaments), *asthi* (bone), and *sandhi* (joints) conglomerate¹. Trauma to these sites can cause severe pain, functional impairment, or even

fatality depending on the damaged structure and severity of injury¹.

Among *Shirogata Marmas*, *Phana Marma* is described as a paired *Sira Marma*. Injury to this Marma results in loss of smell (*Gandha-agyana*)². While classical texts focus on functional outcomes, modern anatomy offers insights into the likely structural correlates, facilitating an integrative understanding of Marma physiology³.

Aim and Objective

Aim

To anatomically and functionally interpret *Phana Marma* described in classical Ayurvedic texts and explore its modern anatomical correlation with the cribriform plate–olfactory nerve complex.

Objectives

1. To review the classical Ayurvedic description of *Phana Marma*, including its location, classification, and functional significance.
2. To identify potential modern anatomical correlates of *Phana Marma*, particularly focusing on the olfactory epithelium, olfactory nerve fibres, and cribriform plate.
3. To analyze the interaction between *asthi* (bone) and *sira* (neurovascular structure) in Marma pathology, emphasizing how trauma to a bony structure may cause sensory loss.
- 4.

Classical Description of Phana Marma

The primary classical description of *Phana Marma* appears in *Sushrut Samhita*, which states:

“घ्राणमार्गमुभयतः स्त्रोतोमार्गप्रतिबद्धे अभ्यांतरतः फणे नाम, तत्र गन्धाज्ञानम्।”²

Key points from this verse include:

- Paired nature: Two *Phana Marmas* are present, one on each side of the nasal passage, intertwined over one another.
- Location: Positioned internally adjacent to the nasal passage.
- Functional consequence: Trauma leads to *Gandha-agyana* (loss of smell)².

Phana Marma is also categorized as a *Vaikalyakar Marma*, indicating that injury causes functional disability rather than immediate death¹.

Functional Significance

The loss of smell described in classical texts corresponds to anosmia, the inability to perceive odours⁹. From the olfactory mucosa, olfaction originates from specialized sensory neurons located in the superior part of the nasal cavity³. Signals from these neurons are transmitted through the olfactory fibres to the olfactory bulb situated in the anterior cranial fossa, which then relays the information via the olfactory tract to the primary olfactory cortex for processing and conscious perception^{3, 6}.

In Ayurvedic terms, this pathway corresponds to the *Phana Marma*, where injury at this site can impair the flow of sensory impulse, manifesting clinically as anosmia, thus illustrating a functional correlation between classical Marma theory and modern neuroanatomy³.

Modern Anatomical Correlation

Cribriform Plate and Ethmoid Bone

The cribriform plate is a thin horizontal plate of the ethmoid bone that separates the nasal cavity from the anterior cranial fossa³. Due to its weak and perforated structure, this region is particularly vulnerable to fractures during facial trauma⁵. When fractured, the sharp bony edges may damage or cut the olfactory nerve fibres passing through its foramina, leading to disruption of the olfactory pathway⁵.

Olfactory Epithelium and Neural Pathway

The olfactory epithelium contains specialized receptor cells whose axons form small bundles of olfactory nerve fibres³. These fibres pass through numerous tiny foramina in the cribriform plate to reach and synapse in the olfactory bulb^{3, 6}. Due to their delicate structure, trauma in this region can easily damage these fibres, leading to anosmia or impaired olfactory perception^{5, 6}.

Clinical Significance

Phana Marma, classified as a *Vaikalyakar Marma* in classical Ayurvedic texts, is situated bilaterally at the lateral aspects of the nasal cavity¹. Injury to this Marma is traditionally associated with *Gandha-agyana* (loss of the sense of smell)². As *Vaikalyakar Marma* injuries are known to produce permanent disability, this description corresponds with the nature of the olfactory nerve fibres, where severe damage can result in irreversible loss of olfactory function^{5, 11}.

Chronic sinonasal conditions such as rhinosinusitis may also affect the sense of smell; however, these conditions generally cause temporary dysfunction that is reversible with appropriate treatment¹⁰. In contrast, trauma involving the cribriform plate, particularly fractures, can create sharp bony edges that may damage or cut the delicate olfactory nerve fibres passing through it⁵. This results in discontinuation of the olfactory pathway and may lead to permanent anosmia, thereby supporting the classical Ayurvedic concept of disability associated with injury to *Phana Marma*^{5, 11}.

Asthi–Sira Interaction in Marma Pathology

Although *Phana Marma* is classified as a *Sira Marma*, the potential anatomical correlate involves a significant *asthi* (bone) component, i.e., the cribriform plate³. This raises an important principle in Marma pathology: bones often serve as protective frameworks for neurovascular structures. Trauma affecting a bony

structure may ultimately damage the neurovascular components passing through it³.

For Phana Marma, fracture or displacement of the cribriform plate can tear the olfactory nerve fibres, leading to anosmia^{5, 11}. This illustrates a broader principle: although Marma classification depends on the dominant structural component, injury may simultaneously affect multiple types of tissue, particularly *sira*.

Additionally, in Sushrut Samhita Sharir Sthana chapter 7, detailed description about *Sira* and its four types is given, among which *Vatavahi Sira* can be interpreted as nerves¹⁷.

Discussion

Phana Marma is described in classical Ayurvedic literature as a paired *Sira Marma* situated in the nasal region, where injury results in *Gandha-agyana* (loss of smell)². This functional description closely corresponds with the modern understanding of the olfactory pathway, in which sensory neurons located in the olfactory epithelium transmit sensory impulses through olfactory nerve fibres which pass through the foramina of the cribriform plate to reach the olfactory bulb³.

From an integrative anatomical perspective, Marma theory recognizes that multiple structural elements—*mamsa*, *sira*, *snayu*, *asthi*, and *sandhi*—intersect at a single site¹. Although *Phana Marma* is classified as a *Sira Marma*, its likely anatomical correlation involves the cribriform plate of the ethmoid bone, highlighting the interaction between *Asthi* and *Sira* in Marma pathology³.

The cribriform plate and its structural framework provide a delicate pathway for the passage of olfactory nerve fibres through its foramina³. In cases of trauma, especially fractures, the broken edges of the plate may injure or tear these delicate fibres, causing discontinuation of the olfactory fibres and ultimately anosmia⁵.

Phana Marma is categorized as a *Vaikalyakara Marma*, meaning that its injury produces permanent functional disability¹. Damage at this site can cause irreversible anosmia due to discontinuation of olfactory nerve fibres⁵. Since these fibres are extremely delicate and their disruption may lead to failure of neural pathway regeneration, the resulting anosmia reflects the classical concept of permanent disability described in *Vaikalyakar Marma* injuries.

Recent clinical and imaging studies further support this interpretation. Trauma to the anterior cranial base, such as fractures involving the ethmoid bone or cribriform plate, and surgical interventions within the

nasal cavity have all been shown to cause olfactory dysfunction^{5, 11}. These findings reinforce the relevance of classical Ayurvedic observations, demonstrating that injury to this anatomically constrained area causes predictable functional outcomes.

Thus, the classical description of *Phana Marma* aligns with modern anatomical and clinical understanding, demonstrating that trauma to the cribriform plate–olfactory nerve complex can lead to permanent olfactory dysfunction, supporting the Ayurvedic concept of marma-induced disability.

Conclusion

Phana Marma is a paired *Sira Marma* located alongside the nasal passage, where injury leads to loss of smell (*Gandha-agyana*)². Several scholars have considered cribriform plate as the modern anatomical interpretation of *Phana Marma*, but after evaluating the concepts of trauma in this study, we can say that the actual structure responsible for *Phana Marma abhigat* is Olfactory nerve fibres present between foramina of cribriform plate which gets damaged by their bony edges as it acts as a weapon. Because trauma over this bony plate (*asthi*) ultimately damages the olfactory nerve fibres (*sira*), which are responsible for olfaction. Furthermore, the classification of *Phana Marma* as a *Vaikalyakara Marma* is supported by the possibility of permanent anosmia resulting from discontinuation of these delicate olfactory nerve fibres^{5, 11}.

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