



Review Article

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A CORRELATIVE STUDY BETWEEN *KUKUNDARA MARMA* AND THE SCIATIC NERVE: AN AYURVEDIC AND ANATOMICAL PERSPECTIVE

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Abstract

Knowledge about *Marma* is important in surgical procedures like *AGNI KARMA*, *KSHARAKARMA* & *SHASTRAKARMA*. Completing these surgeries without complications is beneficial. Understanding the potential anatomical structure impacted and any abnormalities that may result from trauma is helpful. Therefore, understanding *MARMA* is crucial. *KUKUNDARA MARMA* is a *VAIKALYAKARA MARMA* that falls under the structural category of *SANDHI MARMA*. According to legend, the area lies on either side of "*PRISTAVAMSHA*" on "*JAGANA BAHIRBAGHAGA*," where damage results in loss of sensation and movement. From the lower back down the hips, buttocks, and down each leg, the sciatic nerve is the longest and biggest nerve in the human body. It gives the lower limbs their motor and sensory abilities and comes from the lumbar and sacral spine (L4 to S3 nerve roots). It leaves the pelvis via the sciatic notch and passes beneath or through the piriformis muscle. It is made up of the tibial and common peroneal nerves. In order to build a foundational understanding that connects traditional Ayurvedic knowledge with modern neuroanatomy, the goal of this study is to investigate the anatomical and functional correlation between the sciatic nerve in modern anatomy and *KUKUNDARA MARMA* as described in Ayurvedic texts. Additionally, the study aims to highlight the potential clinical implications in managing sciatic nerve disorders using Ayurvedic principles.

Keywords- Ayurveda, Anatomy, Marma, Kukundar, Sciatic Nerve

Introduction

In the ancient Indian medical system known as Ayurveda, the idea of MARMA vital points the intersections of bones (ASTHI), joints (SANDHI), ligaments (SNAYU), blood vessels (SIRA), and muscles (MAMSA) is highly valued. The human body contains 107 MARMAS, each with distinct anatomical and functional significance, according to ACHARYA SUSHRUTA.¹ In addition to being anatomical landmarks, these MARMAS have significant clinical significance since damage or dysfunction at these locations can result in severe pathological outcomes, such as pain, incapacity, and in extreme circumstances, death. The word Marma was originally employed in the Rigveda as Drapi and Varman words, and it was suggested that these points be safeguarded in combat.²

The KUKUNDARA MARMA, which is situated bilaterally close to the sacroiliac joint, is one such significant MARMA. It falls under the category of SANDHI MARMA (joint-dominant) and is intimately linked to postural stability and lower limb movement functions. According to classical writings, damage to this MARMA can result in symptoms including walking difficulties, radiating pain, and muscular stiffness. These symptoms are quite similar to those of sciatic nerve problems, especially sciatica, as described in current literature. Originating in the lumbosacral plexus (L4–S3), the sciatic nerve is the longest and largest nerve in the human body. It passes via the gluteal region and into the lower leg.³ It is a key nerve responsible for motor and sensory innervation to the posterior thigh, leg, and foot. Disorders involving the sciatic nerve, such as compression or inflammation, can result in intense radiating pain, numbness, or motor weakness conditions commonly encountered in clinical practice today. Investigating the possible relationship between KUKUNDARA MARMA and the sciatic nerve is crucial because of the remarkable similarity in both anatomical location and symptom presentation. In addition to enhancing the interdisciplinary discussion between Ayurveda and contemporary anatomy, an understanding of this link makes integrative therapeutic approaches like MARMA therapy, AGNIKARMA, or physiotherapy possible.⁴

This study aims to analyze the anatomical, functional, and clinical correlation between *KUKUNDARA MARMA* and the sciatic nerve, thereby contributing to a deeper understanding of traditional and contemporary approaches to lower back and sciatic pain management.

Review of literature: The meaning of Kukundara word is derived from:

“कन्दरः गुहाकारे पर्वतनितम्बस्थ” (Amarakosha)

The word Kandara denotes a depression and bear a resemblance with the caves seen in mountains.⁵

According to Haranchandra's commentary, this Marma is situated on both sides of the vertebral column in the back. It is referred to as a "Naati Gambhire Kukundare Aavartakare" point, meaning it is either superficially located or resembles a shallow pit with a whorl.⁶

According to Sabda-Sagar and Vaman Shivram Apte, Kukundara are cavities of the loins, which are the bodily parts on either side of the spine between the hip bones and the lowest ribs. According to Acharya Susruta, Kukundara Damage to the marma, which are found on the sides of the vertebral column and on the outside of the buttocks, results in a loss of feeling and function in the lower body. According to Acharya Gayadas, this marma is located in the lateral region of jaghana, close to the nitamb, and is characterized by deep sitting or minor depression; it is vaikalyakara in nature and ardhaangula in praman.

KUKUNDARA MARMA ^{7,8,9}

LOCATION	On both sides of 'PRISTAVAMSHA' on 'JAGANA BAHIRBAGHAGA' i.e. On both posterior superior iliac spine notches, just above buttocks (inside or spinal area of the hip bone).
ANATOMICAL STRUCTURES	MAMSA (muscles): Obturator internus, Piriformis, Gluteus Maximus, Gluteus medius, and Gluteus minimus; Vascular and nerve SIRA: superior gluteal vessels and nerve Nerve and inferior gluteal vessels internal nerves and pudendal vessels, Sciatic nerve, piriformis nerve, quadratus femoris nerve, and obturator internus nerve SNAYU: sacrospinous, sacroiliac, and sacrotuberous ligaments; SANDHI (joints): sacroiliac joint; ASTHI (bones): sacrum, ilium.
VIDDHA LAKSHANA	"SPARSHAAGYANAM ADHAKAYE CHESTHAOPAGHATHA" ¹ i.e. loss of movement and loss of sensation of lower limb (sciatic nerve injury can be predicted)

MARMA CLASSIFICATION BASED ON

Structure or body organs involved	<i>SANDHI MARMA</i>
Consequences of trauma over <i>MARMA</i> area	<i>VAIKALYAKAR</i>
Area or size of <i>MARMA</i>	<i>ARDHANGULA</i>
Sites and locations of <i>MARMA</i>	<i>PRISTHA</i> (Back)
<i>SANKHYA</i> of <i>MARMA</i>	2

Sciatic Nerve^{10,11,12}

The longest and biggest nerve in the human body, the sciatic runs from the lower back down each leg and into the hips and buttocks. It supplies motor and sensory functions to the lower limbs and comes from the lumbar and sacral vertebrae (L4 to S3 nerve roots). Along with facilitating sensations like pain, touch, and temperature in those regions, it regulates the muscles in the back of the thigh, leg, and foot.

Anatomy: The sciatic nerve is a mixed nerve (containing both sensory and motor fibers) formed from the lumbosacral plexus, specifically the ventral rami of spinal nerves L4 to S3.

Its composition includes:

Tibial nerve component: Derived from the anterior divisions of L4–S3.

Common peroneal (fibular) nerve component: Derived from L4–S2 posterior divisions. The nerve's origin is about 2 cm wide, making it the body's largest peripheral nerve. After leaving the pelvis through the greater sciatic foramen, usually beneath the piriformis muscle, it travels through the gluteal region and into the thigh, where it splits into its two main branches: the tibial nerve and the common fibular nerve (also known as the common peroneal nerve). The tibial part contains the ventral divisions of L4, L5, S1, S2, and S3, while the common fibular part contains the dorsal divisions of L4, L5, S1, S2, and S2. It innervates muscles in the posterior compartment of the thigh and muscles in the leg and foot and carries sensory fibers from the skin of the foot and lateral leg.

Function: Supplies motor function to hamstrings, calf, and foot muscles; sensory innervation to the skin of the leg and foot.

Common Issues:

Sciatica: Pain, numbness, or tingling caused by compression or irritation, often due to a herniated disc, spinal stenosis, or piriformis syndrome. Symptoms typically radiate along the nerve's path.

Causes: Disc herniation (most common), pregnancy, trauma, or prolonged sitting. Symptoms: Sharp or burning pain, weakness, or numbness from the lower back to the leg or foot, often unilateral.

Diagnosis: Clinical evaluation, imaging (MRI/CT), or electromyography (EMG) to assess nerve function.

Treatment:

Conservative: Physical therapy, stretching, anti-inflammatory medications, or corticosteroid injections.

Surgical: For severe cases (e.g., microdiscectomy for herniated discs).

Lifestyle: Ergonomic adjustments, weight management, and core strengthening.

Comparative Analysis and Integration of both concepts

KUKUNDARA MARMA, which is situated bilaterally in the gluteal region, particularly around the KATIPRSTHA or posterior pelvic area, is categorized under SANDHI MARMA (joint linked important points) in Ayurvedic RACHANA SHARIR. It is said to be located between the sakthi (thigh) and SHRONI (hip bone), designating a location of neuromuscular and energetic importance. According to traditional sources, damage to this MARMA results in lower limb RUJA (pain), SPARSHAAGYANAM (numbness or loss of sensation), or CHESTAOPAGHATA (loss of movement).¹³

The sciatic nerve is the biggest nerve in the human body, according to modern anatomical studies. It originates in the lumbosacral plexus (L4-S3), travels through the greater sciatic foramen, passes beneath the piriformis muscle into the gluteal region, and then descends along the posterior thigh. The location reported is exactly correlated with this anatomical tract.

KUKUNDARA MARMA-^{14,15}

Clinical sciatica, which is characterized by radiating pain, numbness, trouble walking, or tingling, is caused by irritation or compression of the sciatic nerve. These symptoms frequently resemble the Ayurvedic signs of KUKUNDARA MARMA trauma. This overlap confirms the therapeutic significance of MARMA locations in contemporary neurology and musculoskeletal medicine in addition to supporting the conventional understanding of these regions.

Result :

In terms of location, symptomatology, and clinical relevance, there is a remarkable match between the anatomical course of the sciatic nerve and the Ayurvedic descriptions of KUKUNDARA MARMA.

- From an anatomical perspective, both are situated in the gluteal area (the posterior pelvic region) between the hip and thigh, which corresponds to the path taken by the sciatic nerve as it leaves the pelvis and passes through the gluteal region.
- The clinical presentation of sciatica, which includes radiating pain, muscle tightness, and functional limitation, is closely mirrored by the traditional Ayurvedic signs of KUKUNDARA MARMA injury, such as RUJA (pain), SPARSHAAGYANAM (loss of sensation or numbness), CHESTAOPAGHATA (loss of movement), SANKOCHA (contraction), and STAMBHA (stiffness).
- Functionally, the MARMA's designation as SANDHI MARMA (joint-associated) and its neuromuscular significance reinforce its association with the sciatic nerve, a neuroanatomical structure of paramount importance.
- This association demonstrates how Ayurvedic and contemporary medical frameworks significantly overlap, supporting the therapeutic applicability of MARMA science in the diagnosis and treatment of neuromuscular conditions like sciatica. The study indicates that complementary methods to sciatic nerve pathologies can be provided by Ayurvedic treatments such as MARMA therapy, ABHYANGA, BASTI, and AGNI KARMA, which are usually utilized for MARMA-related ailments.

Thus, the findings support the hypothesis that *KUKUNDARA MARMA* and the sciatic nerve share anatomical and functional parallels, making an integrative therapeutic model both rational and beneficial.

Discussion:

This study aims to establish a connection between the old Ayurvedic interpretation of KUKUNDARA MARMA and the current anatomical understanding of the sciatic nerve, revealing significant parallels that support the ancient texts' long-standing findings with new scientific expertise. The KUKUNDARA MARMA in RACHANA SHARIR is a SANDHI MARMA that is situated bilaterally close to the point where the SHAKTI (thigh) and SHRONI (hip bone) converge. RUJA (pain), SANKOCHA (contracture), and STAMBHA (stiffness) are the signs of injury, indicating the neuromuscular and energetic significance of this region. These clinical signs resonate strongly with the modern neurological condition of sciatica, caused by irritation or compression of the sciatic nerve, which runs through a comparable anatomical region.

The sciatic nerve starts in the lumbosacral plexus (L4–S3), leaves through the larger sciatic foramen, passes beneath the piriformis muscle, and then passes through the gluteal region

to the posterior thigh, exactly where KUKUNDARA MARMA is described. The claim that ancient Ayurvedic scholars experimentally determined MARMA locations through careful anatomical observation and clinical experiences is supported by this structural and symptomatic association.

A special therapeutic approach is also provided by the Ayurvedic treatment of MARMA ABHIGHATA, or trauma to key areas. For ailments involving pain, stiffness, and neuromuscular dysfunction, traditional therapies like MARMA therapy, ABHYANGA, BASTI (medicated enemas), and Agni Karma (therapeutic cautery) have long been advised. There are encouraging similarities between these modalities and modern management techniques like physical therapy, nerve decompression, or neuro-modulatory approaches. BASTI, in particular, targets VATA DOSHA, which is prevalent in sciatic diseases.

The two paradigms' convergence suggests that Ayurvedic MARMA science has practically applicable insights into today's neurological and musculoskeletal conditions. A foundation for integrative treatment procedures that respect both traditional knowledge and contemporary anatomy is provided by the recognition of KUKUNDARA MARMA as an analog of the sciatic nerve trunk.

Additionally, this study encourages more extensive scholarly research into the neuroanatomical underpinnings of other ideas, which could improve their legitimacy and usefulness in integrative healthcare systems. Evidence-based revival of Ayurvedic therapies, especially in chronic pain management and rehabilitation, can result from such interdisciplinary understanding.

Conclusion-

The term Kundara, which is preceded by the word Ku, is the source of the name Kukundara. Ku stands for "earth." Kundara means little hole or depression. Kundara marma is under the Sandhi category. On the dorsolateral part of the pelvic bone, there are marma on either side of the spinal column. The lower boundary of the dorsal sacroiliac joint and the superior border of the sciatic foramen are continuous. In order to support safe, efficient integrative practice and to investigate causes, modern physicians are looking more and more for anatomical correlates for conventional ideas. The primary neuroanatomical substrate of sciatica is the sciatic nerve, the biggest peripheral nerve, which runs from the pelvis via the gluteal region and down the posterior thigh. In order to assess the geographic and functional relationship between Kukundara marma and the sciatic nerve, this paper combines textual and anatomical data and provides a repeatable experimental strategy.

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