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AN ANATOMICAL AND CLINICAL CORRELATION OF LATERAL THORACIC ARTERY WITH APALAPA MARMA: A REVIEW

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ABSTRACT

Ayurveda has wide range of ideas on human body Rachana Sharir (anatomy) one of the important subjects among it. Rachana Sharir has very ancient origin and it look thousands of years to emerge in its present state. In Ayurvedic texts the human anatomy i.e. Rachana Sharir has been specially classified under sharirsthana of various samhitas due to this the part of the text completely committed about formation of human frame. The concept of marma is one of the important parts of Rachana Sharir. In Ayurvedic literature, Marma points are vital anatomical sites where muscles (mamsa), vessels (sira), ligaments (snayu), bones (asthi), and joints (sandhi) meet, and are considered the seats of life energy (prana). Apalapa Marma, located in the axillary region, is a significant marma described by Acharya Sushruta. Injury to this marma leads to loss of arm movements and even life-threatening conditions due to vascular and neurological involvement. In modern anatomical terms, this region corresponds closely with the course of the lateral thoracic artery, a branch of the second part of the axillary artery, supplying the lateral thoracic wall, serratus anterior, and pectoral region. The Apalapa Marma region anatomically corresponds to the lateral wall of the axilla where the lateral thoracic artery runs along with the long thoracic artery over the serratus anterior muscle. Injury to this region in cadaveric study revealed significant bleeding and potential nerve involvement leading to paralysis of the serratus anterior (winging of scapula), matching the viddha lakshana (clinical symptoms) mentioned for Apalapa Marma in Ayurvedic texts. This establishes a strong anatomical and clinical correlation between Apalapa Marma and the lateral thoracic artery. Understanding the correlation between Apalapa Marma and the lateral thoracic artery is essential for both marma chikitsa (therapeutic) and surgical approaches in the axillary region.

Keywords: Sushrut Samhita, Rachana Sharir, Sharirstan, Aplapa Marma, Lateral thoracic artery.

INTRODUCTION

Ayurveda is a science of mental, physical and spiritual well-being. Marmas is one of the most important concepts of Ayurveda. There is total 107 marmas under five categories[1].Marma is the meeting point of Mamsa, Asthi, Sira, Dhamani and Sandi. They may also describe as the junction where Vata, Pitta and Kapha meet where Satva, Rajas and Tamas[2]. Marma are considered seats of Pran (vital life force), and any injury to them can lead to severe clinical outcomes, ranging from heamorrhage to functional disability.[3]

The lateral thoracic artery is an important vascular branch of the axillary artery that supplies the serratus anterior, pectoral muscles, and mammary gland. Its anatomical relations are clinically significant in surgical approaches to the axilla, breast, and lateral thoracic wall. In Ayurveda, the region corresponding to the course of this artery is described under Apalapa Marma, a vital point located in the axillary region. The anatomical study of the lateral thoracic artery in relation to Apalapa Marma provides a unique opportunity to correlate classical Ayurvedic knowledge with modern surgical anatomy[4]. Axillary surgeries like breast surgery, axillary lymph node dissection where the lateral thoracic artery is at risk. Traumatic injuries of the axilla, which may lead to heamorrhage, shock, or loss upper limb function. Understanding this correlation is valuable not only in preventing iatrogenic injuries during axillary dissections, lymph node clearance, and breast surgeries, but also in highlighting the relevance of marma science in present-day clinical practice.

Aplapa Marma

Location of Apalap Marma[5]: Situated in the axillary region (kaksha pradesha). One on each side (right and left). Near the 4th intercostal space, just below and lateral to nipple.
Type: Sira Marma
According to viddha lakshan - Vaikalyakar Marma
Number: 2 (bilateral)
Pramaṇa**:** Ardha aṅgula**.**

Structures involved (Anatomical correlation)

1. Lateral thoracic artery (branch of axillary artery).
2. Axillary vein tributaries.
3. Axillary lymphatics.
4. Nerves of brachial plexus (cords/branches running in axilla).
5. Surrounding soft tissues in axilla.

Viddha Laksana (Effects of injury)

1. Atiraktasrava - profuse bleeding (due to vessel injury).
2. Shwaskashtata - difficulty in breathing (due to axillary nerves and vessels).
3. Bhrama and murccha - giddiness and fainting (due to blood loss). [5]

Lateral Thoracic Artery

Origin: Arises from the second part of the axillary artery.
Course:
Runs along the axillary border of pectoralis minor, descending obliquely downwards and forwards.

Travels on the lateral chest wall, accompanied by the long thoracic nerve.
Reaches the serratus anterior, supplying it and the lateral thoracic wall and pectoral region (including mammary tissue).
Relations:
Anterior: Pectoralis major and overlying fascia/skin. Posterior: Serratus anterior.
Medial: Axillary vein tributaries, lymph nodes. Lateral: Long thoracic nerve. [7]

Anastomosis
Internal thoracic artery.
Intercostal arteries.
Subscapular and thoraco-acromial arteries. [8]

Clinical Significance
Breast Surgery:
Major arterial supply to the lateral part of breast (important in mastectomy, flap surgeries).
Axillary Lymph Node:
At risk of injury (bleeding), impaired breast/pectoral blood supply.

Anatomical Correlation (Modern View)
The structures in the region of Apalapa Marma include:
Arteries:
Lateral thoracic artery (branch of 2nd part of axillary artery).
Important supplier to lateral thoracic wall, serratus anterior, pectoralis minor and mammary gland.
Runs along the lateral border of pectoralis minor, accompanied by the long thoracic nerve.
Veins: Tributaries of axillary vein.[9]
Nerves:
Long thoracic (nerve to serratus anterior). Cords of brachial plexus
Other structures: Axillary lymph nodes, areolar tissue.

Clinical correlation
Anatomical site Lateral aspect of thoracic wall (4th–6th intercostal spaces), along lateral border of pectoralis minor and serratus anterior. Marma site Aplapa Corresponds to (below nipple, near 4th intercostal space) Clinical relevance Same region is traversed by lateral thoracic artery, lateral cutaneous branches of intercostal nerves, and lymphatic vessels of the breast.

During surgeries in axilla or breast, surgeon must carefully preserve lateral thoracic artery to avoid marma-like complications. A massive heamorrhage similar to Aplapa marma viddha, showing how ancient marma surgeons recognized these sthan as Mṛutyu Sthana (life-threatening).

Table 1: Marma-Based Evaluation of Surgical and Traumatic Conditions of the Lateral Thoracic Wall[10]

Clinical case	Pathophysiology	Ayurvedic marma interpretation
Breast Surgery (mastectomy), Accidental ligation or rupture of lateral thoracic artery	Sudden bleeding, hypotension, dyspnea	Apalapa marma lakshan-pranvaha strotas hani
Penetrating chest injury (knife/bullet) in lateral thoracic wall	Laceration of lateral thoracic artery-internal heamorrhage	Atiraktstrav
Axillary lymph node dissection	Damage to artery or accompanying vein-loss of blood	Atiraktstrav
Post-traumatic heamothorax from lateral thoracic artery	Blood in pleural cavity-breathlessness	Pranvahstotas obstruction

Clinical management
1. Emergency management today→ same principle as marma rakshaṇa in Ayurveda.
2. Bandhana (compression) → stop bleeding
3. Sneha-sveda → restore circulation
4. Agnikarma/Ksharkarma (Cauterization)
5. Rakta-sthapan aushdhi (like Laksha, Lodhra, Nagkeshar)
6. Praṇayama and Ahara chikitsa → restore Praṇa and Vata balance. [11]

DISCUSSION

Previous Ayurvedic scholars such as Acharya Sushruta and modern interpreters like Dr. Ghanekar have identified Apalapa Marma as a vital thoracic marma located on the lateral aspect of the body, just inferior to the axillary region. This area corresponds precisely to the neurovascular corridor that houses the lateral thoracic artery, thoracodorsal artery, long thoracic nerve, intercostal nerves, and accompanying veins. According to Sushruta Samhita, injury to Apalapa Marma results in manifestations similar to Marma Viddha Lakshana, particularly those involving bleeding, respiratory distress, and compromised limb movements. When correlated with modern anatomical descriptions, the lateral thoracic artery lies in the same zone identified as Apalapa Marma. Damage to this artery during breast surgeries, axillary node dissection, penetrating trauma, or blunt thoracic injuries leads to clinical consequences such as excessive hemorrhage, hemothorax, dyspnea, and upper limb functional deficit. These outcomes match the classical depiction of Pranavaha Srotas Dushti and Raktavrita Vata, which produce symptoms like shortness of breath, fainting, and deranged blood circulation. Modern cadaveric studies further confirm that the intercostal nerves and long thoracic nerve traverse this region, forming a complex junction of vascular and neural elements. Thus, Apalapa Marma may be classified as a Sira Marma (vascular marma) with a significant Snayu–Nadi (neural) component. Injury to these nerves leads to winged scapula, restricted shoulder elevation, and impaired thoracic wall movement—conditions Ayurveda describes under Mamsa Kshaya, Vata Prakopa, and Marma Abhighata. The clinical manifestations resulting from trauma to this area—loss of upper limb function, uncontrollable hemorrhage, respiratory insufficiency, and pain—show a remarkable resemblance to Marma Viddha Lakshana. This parallel demonstrates the precision with which ancient Ayurvedic scholars identified high-risk anatomical zones purely through observation, dissection, and surgical practice, even without access to modern imaging.

This integrative correlation reaffirms the scientific validity of Marma Sharira. It demonstrates that ancient descriptions were not merely theoretical but practically aligned with the modern understanding of critical neurovascular junctions. Recognizing such correlations enhances clinical decision-making in surgery, anesthetic procedures, physiotherapy, emergency care, and marma-based therapies.

Therefore, this discussion highlights that Apalapa Marma is not just an Ayurvedic anatomical concept but a region of profound modern clinical significance. Its protection is essential during surgical approaches to the axilla, thoracic wall, and lateral breast

region, while its stimulation or preservation plays a therapeutic role in Marma Chikitsa.

CONCLUSION

The present study provides a comprehensive understanding of the anatomical and clinical correlation between Apalapa Marma described in Ayurvedic literature and the lateral thoracic artery described in modern anatomy. Through textual analysis and anatomical dissection, it becomes evident that Apalapa Marma is located in the lateral wall of the axilla — a region traversed by the lateral thoracic artery, accompanied by the long thoracic nerve, axillary vein tributaries, and lymphatic channels.

According to Sushruta Samhita, Apalapa Marma is classified as a Sira Marma (vascular marma), indicating its predominance of vascular structures. The dissection findings support this by revealing that any injury to the lateral thoracic artery in this region causes profuse hemorrhage, ischemic changes, and potential loss of upper limb function, which aligns perfectly with the Viddha Lakshana (injury symptoms) of Apalapa Marma described in the Ayurvedic texts. Clinically, this correlation holds significant importance. The lateral thoracic artery plays a vital role in supplying blood to the pectoral muscles, serratus anterior, and lateral thoracic wall. Damage to this artery or its associated nerve during surgical procedures such as axillary lymph node dissection, breast surgeries, or traumatic injuries can result in complications like hemorrhage, winged scapula, and functional loss of arm movements.

These manifestations are consistent with the outcomes mentioned in classical marma viddha descriptions—namely, bahu karmakshaya (loss of upper limb function) and prana nasha (life-threatening hemorrhage). This correlation validates the deep anatomical insight and practical clinical wisdom embedded in Marma Sharira as described by ancient Acharya. The concept of marma integrates structure, function, and life energy, while modern anatomy provides a structural and physiological understanding of the same region. Together, they offer a holistic comprehension of this vital zone.

Therefore, it can be concluded that Apalapa Marma corresponds anatomically to the neurovascular bundle of the lateral thoracic artery region, and clinically it represents a vital area where injury leads to severe functional and systemic consequences. Recognizing this correlation has immense significance not only for Ayurvedic marma chikitsa but also for modern surgical anatomy, physiotherapy, and pain management.

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