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# A CRITICAL STUDY OF BASTI MARMA WITH ITS CLINICAL ASPECTS

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## ABSTRACT

Ayurveda, the science of life (Ayus), emphasizes the integration of Sarira (body), Indriyas (senso-motor organs), Mana (mind), and Atma (soul), with the body forming the foundational aspect for health and well-being. Among the 107 Marmas described in classical texts, Basti Marma, located in the pelvic region, holds critical clinical importance as a Pranahara Marma. Ancient Ayurvedic scholars, particularly Acharya Sushruta, highlighted its anatomical, physiological, and pathological significance, correlating trauma to this site with pain, dysfunction, hemorrhage, and even mortality. This study combines literary review of classical Ayurvedic texts (*Susruta Samhita*, *Charaka Samhita*, *Vagbhata*) with cadaveric dissection to elucidate the anatomical relations of Basti Marma and its connection to the urinary system. The findings demonstrate that Basti Marma corresponds to the urinary bladder and its surrounding neurovascular structures, integrating Ayurvedic concepts of Prana, Dosha, and Srotas with modern anatomical and clinical knowledge. Understanding Basti Marma provides valuable insights for surgical practice, trauma management, and integrative healthcare, reaffirming its relevance as a vital organ and functional center of life force.

**KEYWORDS:** Basti, Marma, Dissection, Ayurveda.

## INTRODUCTION

Ayurveda, the science[1] of life (Ayus), views life as a combination of Sarira (body), Indriyas (senso-motor organs), Mana (mind), and Atma[2] (soul), where the body forms the foundational aspect for health and well-being. Acharya Charak emphasized the importance of preserving the body, stating that all achievements in the world depend on it. A thorough understanding of anatomy and physiology is therefore essential for proper diagnosis, treatment, and surgical expertise in Ayurveda.[3]

Acharya Susruta, known as the father of surgery and the Dhanvantari school's leading anatomist, advocated direct observation and dissection of cadavers (Pratyaksa Jnana) to gain practical knowledge of body structures such as Sira, Dhamani, Snayu, Asthi, Sandhi, and Marma. His encyclopaedic work, *Susruta Samhita*, details surgical procedures, instruments, and classifications of wounds, fractures, and other conditions, laying the foundation for modern surgical practice.[4]

Among the vital structures, Marmas are critical points where multiple tissues converge with subtle life forces (Prana). Injury to Marmas can cause pain, dysfunction, or even death. Of the 107 Marmas described[5], the *Kosthagat*/*Udaragat* Marmas particularly Basti Marma hold significant clinical importance. Studying Basti Marma thus provides valuable insight into anatomy, physiology, and therapeutics, making it a pertinent topic for research in *Rachana Sharira*.

### Objective of the study

1. To study Basti Marma and their relations to surrounding structures.
2. To study related anatomical structures and clinical importance of urinary system.

## MATERIAL AND METHODS

### Source of the data

a) Literary data will be collected from Brihatrayis, Laghutrayis and other classical texts including journals, presented papers and text books of contemporary science.

b) Cadaveric dissection will be carried out in the Department of Rachana sharira, Sri Sai Ayurvedic Medical College & hospital, Aligarh, U.P.

**Method of collection of the data**

a) Literary works, thesis, journals, including articles published on the concept related to subject will be reviewed and relevant information will be collected.

b) Six properly prepared and preserved cadavers will be dissected to study the anatomical relations of Basti Marma with special reference to clinical anatomy data will be collected.

**Design of the study:** The collected literary data from classical and contemporary science will be analyzed with help of cadaveric dissection; minimum of 6 bodies will be selected.

a) Inclusion criteria: Well prepared and preserved cadaver.

b) Exclusion criteria: Cadaver which is not preserved properly.

**Assessment criteria:** The related structures in the body will be viewed and assessed with the help of Ayurvedic and Modern reference. Review of Ayurvedic Literature.

**Ayurvedic Literature Review**

Basti Marma is one of the most important Pranahara Marmas described by Acharya Sushruta among the 107 vital points, located in the pelvic region and considered fatal on injury. The word *Marma* itself denotes a life seat (*Jivasthana*) where Mamsa, Sira, Snayu, Asthi, and Sandhi meet, and where Prana resides, hence injury produces consequences ranging from pain and dysfunction to death. References of such vital spots are available in the Vedas, and later Ayurveda developed a systematic classification where Charaka also enumerated Basti as one of the Dasha Pranayatanas[6], while Kashyapa mentioned it as a Maha Marma, emphasizing its supreme vitality. Structurally, it represents the urinary bladder and its surrounding neurovascular components where Prana along with Tridosha, Rajas, Tamas, and Atma reside. Clinically, injury to the central part (*Madhya Viddha*) is usually fatal causing *Sadhyo Marana* or *Kalantar Marana*, while peripheral injury (*Antah Viddha*) may produce severe pain, retention of urine, altered pulsation (*Vishama Spandana*), and systemic collapse due to hemorrhage and secondary shock. The Ayurvedic description of Basti Marma closely correlates with modern understanding of pelvic and bladder trauma, vascular injury, and neurogenic or hypovolemic shock, thereby highlighting its timeless clinical relevance as a vital life-supporting structure.

In Ayurveda, *Nabhi, Basti, and Guda* are described as Udargata Marmas[7], each having supreme clinical importance due to their role as seats of *Prana*. *Nabhi Marma* is highlighted by Caraka, Sushruta, and Vagbhata[8] as a Pranayatanam and *Koshtanga*, situated between

*Amashaya* and *Pakvashaya*, serving as the origin of *Siras* and *Dhamanis*, and playing a vital role in *Garbha Poshana* through the *Nabhi Nadi* connecting fetus and mother. It is also regarded as the site of *Pitta* and *Agni* (*Jyothisthana*), with Sushruta describing Nabhi as surrounded by numerous vessels like spokes of a wheel. *Basti Marma*, located in the pelvic region, is a Pranahara Marma, injury to which results in hemorrhage, urinary leakage into the peritoneum, secondary shock, or fatal sepsis. *Guda Marma*, belonging to the anorectal region, is equally dangerous due to its predisposition to uncontrollable hemorrhage and anaerobic infection, highlighting both anatomical and physiological risks. Ancient observations by Sushruta and Vagbhata emphasized the dual dangers of hemorrhagic shock and septic complications, which modern trauma surgery corroborates in cases of pelvic vascular injury, bladder rupture, and anorectal wounds. Thus, Ayurvedic understanding of *Udargata Marmas* integrates structural, functional, and clinical perspectives, establishing their status as vital seats of Prana where injury can lead to catastrophic outcomes.

**The review of Basti Marma:** Highlights its significance from Vedic to Samhita periods, where references to urinary structures like *Gavini*, *Basti*, and *Basti-bila* are found in the Atharva Veda, while the Puranas (especially Garuda Purana) elaborate on *Mutravaha Srotas*[9] and related disorders. Classical Samhitas such as *Sushruta*, *Charaka*, *Kashyapa*, and *Vagbhata* provide detailed descriptions of Basti's anatomy, physiology, pathology, and clinical relevance, identifying it as a vital organ (*Marma*) and reservoir of urine with shapes compared to *Alabu* (gourd) or *Dhanurvakra* (bow). Structurally, it is a hollow, thin-walled organ with ligamental support, related closely to surrounding structures like rectum, testes, and uterus in females, while *Vrikkas* (kidneys) and *Gavinis* (ureters) are also mentioned in connection. Embryologically, Basti is derived from *Matrija Bhava* and counted among *Kosthangas.*[10] Its clinical importance as a *Snayu Marma*[11] of four-finger dimension lies in its categorization as a *Sadyah Pranahara Marma*, where injury leads to fatal consequences due to disturbance of *Vata*, blood loss, and deranged physiology, reflecting the ancient yet scientific understanding of trauma and emergency care in Ayurveda.

The modern literature describes the abdomen as the largest cavity of the body, oval in shape, bounded by the diaphragm above, the pelvic diaphragm below, abdominal muscles and fascia in front and sides, and the vertebral column with associated muscles behind, containing major digestive organs, liver, pancreas, spleen, kidneys, suprarenal glands, and peritoneum, with apertures for transmission of vessels, ducts, and nerves, and divided into nine regions for

clinical description. In relation to Marma, ancient knowledge emphasized vital points where trauma caused severe consequences, anticipating modern concepts of anatomy, trauma, and shock. Sushruta's descriptions of *Sadyah Pranahara* and *Kalantar Pranahara* Marmas parallel modern understanding of vascular and muscular injuries, hemorrhage, infection, and post-traumatic complications. Despite advancements in surgical techniques, antibiotics, and trauma management, injuries to abdominal vessels such as the aorta, celiac, and mesenteric arteries still carry high fatality, validating Sushruta's emphasis on the umbilical and abdominal regions. The pathophysiology of *Marmabhighata* described as *Vataprakopa* leading to systemic collapse corresponds with modern shock, a sudden derangement of physiological function due to hemorrhage and reflex vasodilatation. Marma are seen as reservoirs of *Prana*, where injury disrupts vital life forces, reflecting both traditional and modern recognition of their critical role in sustaining life.

**Dissection**

**Dissection in the Ayurveda Era**

Dissection has always been regarded as a fundamental method for acquiring a thorough understanding of human anatomy, and Acharya Sushruta stands out as the pioneer who introduced and emphasized this practice in ancient India. At a time when touching or handling a dead body was considered a grave social taboo and often attracted punitive action, Sushruta displayed remarkable courage and vision by advocating cadaveric dissection as an essential component of medical education. His approach was not only revolutionary for the ancient world but also unique in its technique and purpose, making the *Sushruta Samhita* the earliest documented treatise to systematically describe human dissection.

The method of dissection described by Sushruta involved softening the body by immersing it in running water to minimize putrefactive odor and to make tissues easier to separate. The softened body was then carefully scraped layer by layer using bamboo slivers, sharp thin sticks, and brushes with soft or hard bristles. This process allowed the gradual removal of tissues, beginning from the external skin and extending toward the deeper structures, ensuring that every part could be observed in sequence. The duration of approximately seven days was considered sufficient for completing this detailed examination, allowing the student to identify and record the structural details of the body meticulously.

Through this process, Sushruta was able to describe many anatomical features with surprising precision. His accounts of the layers of the skin, membranes, bones, joints, and other organs

demonstrate an extraordinary observational ability, and in many aspects they correspond with the descriptions of modern anatomy. While certain ambiguities and inaccuracies are present, it would be unfair to dismiss his findings as merely speculative or fanciful. On the contrary, they reflect the limitations of the era and yet reveal a profound attempt to systematically document the internal structures of the human body.

The significance of Sushruta's contribution to dissection lies not only in the accuracy of his observations but also in the boldness of his methodology. His insistence on direct study of the human body provided the essential anatomical knowledge required for surgical practice. In this way, he laid the foundation for the development of surgery in India, centuries before similar practices gained acceptance in other parts of the world. Thus, Sushruta's work in cadaveric dissection is a milestone in medical history, bridging the ancient with the modern and highlighting the timeless value of hands-on anatomical study.

## Dissection in the Modern Era[12, 13, 14]

### Cadaveric Changes

After death, the body undergoes characteristic changes that confirm death and help distinguish a living from a dead body:

1. **Cadaveric Lividity (Postmortem Stain):** Body fluids collect in dependent parts. For a supine body, bluish discoloration occurs in the back and waist regions.
2. **Rigor Mortis:** Muscles stiffen due to halted contraction. This begins a few hours after death and lasts up to three days.
3. **Cooling of the Body:** Body temperature gradually falls; reaching ~80°F is a confirmatory sign of death.
4. **Putrefaction:** Tissue decomposition occurs due to bacterial activity and autolysis, representing a key sign of death.

### Dissecting Instruments

Essential instruments include:

- **Scalpel:** Metal handle with detachable curved blade (~4 cm). Blades must be sharp and frequently replaced.
- **Forceps:** One pair blunt with serrated surfaces; one pair fine with pointed tips for delicate work.
- **Scissors:** Large blunt (~15 cm) and fine pointed pair for precision dissection.
- **Probe/Seeker:** Metal with blunt tip.

Additional instruments like bone forceps, saws, and long knives are used as needed.

**Cadaver Preservation**

Cadavers for dissection are embalmed using a solution of carbolic acid (½ L), formalin (4 L), glycerine (1 L), rectified spirit (½ L), and water (8 L). Embalming involves:

- Supine positioning, incision near the inguinal ligament, and reflection of skin and superficial fascia.
- Insertion of a cannula into the femoral artery; embalming fluid is introduced by gravity.
- Limb-specific perfusion and storage in a mortuary chamber at 3–10°C.

**Approach to Abdominal Viscera**

- **Incisions:** Vertical from xiphoid to umbilicus, circular around umbilicus, and curved along the iliac crest to pubic symphysis and lateral abdominal walls.
- **Skin and Superficial Fascia:** Skin reflected; superficial fascia consists of fatty and membranous layers. Membranous layer separates easily from aponeurosis of external oblique.
- **Muscular Layer:** Three layers of abdominal muscles—external oblique, internal oblique, transversus abdominis—enclose rectus abdominis forming the rectus sheath. Muscles were carefully stripped and reflected.

**Peritoneum**

- **Parietal and Visceral Layers:** Parietal lines abdominal wall; visceral covers organs. Mesothelium keeps surfaces smooth with serous fluid.
- **Folds and Omenta**
  - **Greater omentum:** Four-layered fold from the stomach and duodenum over intestines.
  - **Lesser omentum:** Connects lesser curvature of the stomach and duodenum to liver.
- **Compartments:** Supracolic (liver, stomach, spleen) and infracolic (caecum, colon, jejunum, ileum).

**Abdominal Autonomic Plexuses**

- **Sympathetic:** Greater, lesser, and least splanchnic nerves connect to celiac, aortic, renal, superior and inferior mesenteric, and superior hypogastric plexuses. Lumbar sympathetic trunks with four ganglia each were traced.
- **Parasympathetic:** Vagus nerve (anterior from left, posterior from right) supplies stomach, liver, biliary tree; pelvic nerves arise from S2–S4.

**Major Plexuses**

- **Celiac Plexus:** Largest; surrounds celiac artery and roots of superior mesenteric artery. Connected to phrenic, splenic, hepatic, suprarenal, renal, and gonadal plexuses.
- **Aortic Plexus:** Posterior to pancreas and inferior vena cava; continues as superior hypogastric plexus.
- **Renal Plexus:** Along renal arteries, continues into ureters and contributes to gonadal plexus.
- **Hepatic Plexus:** Branches from celiac and vagus nerves; supplies liver, bile ducts, gallbladder, and pylorus.
- **Splenic Plexus:** Sympathetic fibers from celiac plexus around splenic artery.
- **Suprarenal Plexus:** Pre-ganglionic sympathetic fibers from lower thoracic segments via celiac ganglion and greater splanchnic nerve.
- **Mesenteric Plexuses:** Superior and inferior mesenteric plexuses accompany respective arteries, derived from aortic and splanchnic nerves.

Modern dissection provides detailed anatomical and neurovascular mapping, allowing safe identification of organs, vessels, and autonomic innervation essential for surgical training and research.

## DISCUSSION

The urinary system, comprising the kidneys, ureters, bladder, and urethra, plays a crucial role in eliminating metabolic wastes, regulating fluid balance, blood pressure, electrolytes, and maintaining pH homeostasis. Modern medicine explains this system with precise anatomical and physiological details, while Ayurveda, though not always anatomically explicit, provides a profound conceptual framework for understanding its functions and disorders through *Mutravaha Srotas* and related principles. In Ayurveda, the body is considered a functional integration of *Dosha, Dhatu,* and *Mala*. During the process of digestion and tissue metabolism, waste products (*Mala*) are produced, which are essential to excrete for maintaining health. Among these, *Mutra* and *Sweda* represent fluid waste products, with *Mutra* performing a pivotal role in transporting fluids and regulating systemic balance. Acharya Vagbhata attributed body maintenance to *Purisha* as the primary solid waste, while *Sweda* and *Mutra* are linked to fluid regulation, highlighting their essential physiological actions. Acharya Sushruta further mentions filling of the *Vasti* (urinary bladder) as the

physiological action of urine, equating it with an ocean-like reservoir where channels carrying fluid from the body converge.

The concept of *Mutravaha Srotas*[15] is central in Ayurvedic anatomy and physiology. It is described as a channel made of *Mamsa* extending from *Vankshana* to *Sepha*, responsible for carrying urine. According to Charaka, there are thirteen *Mahasrotas*, while Sushruta mentions eleven pairs, both identifying *Mutravaha Srotas* as vital for excretion of urine. Its *Mula* (roots) are described as *Basti, Vankshana*, and *Medhra*. Trauma to these structures, as emphasized by Sushruta, results in acute urinary retention, bladder distension, painful micturition, and even death. This indicates that the ancients had a sophisticated awareness of the importance of the urinary system and its potential pathologies, long before the advent of modern urology. The *Mutravaha Nadis* or *Gavinis* can be compared to ureters, channeling urine from *Vrikka* (kidneys) into the *Vasti* (bladder), establishing a clear correlation between Ayurvedic[16] and modern descriptions.[17]

Ayurvedic texts also detail the process of *Mutra Nirmana* (urine formation). According to Sushruta, digested food undergoes separation into *Sara* (nutritive portion) and *Kitta* (excretory portion) under the influence of *Samana Vayu*. The liquid part of *Kitta* gradually transforms into urine through stages of *Udaka, Kleda*, and finally *Mutra*. The analogy of a mud pot absorbing water through its pores, used by Dalhana[18], clearly reflects the concept of filtration, which aligns with the modern understanding of renal physiology. Thus, while the structural description in Ayurveda is metaphorical, it contains rational interpretations that resonate with present-day nephrological science.

Pathologies associated with *Basti* and *Mutravaha Srotas* are described in detail in classical texts. They are grouped into three categories: diseases with predominant urinary manifestations (e.g., *Mutrakruchha, Mutraghata, Ashmari, Prameha*), organ-specific disorders (*Vrikka Vidradhi, Asthila, Granthi, Basti-Shotha*), and systemic conditions with urinary involvement (e.g., *Jwara, Atisara, Pandu, Kamala*). Among these, *Ashmari* (urinary calculi) receives special attention, as both medical and surgical approaches are recommended for its management. The clinical features described in Ayurveda such as suprapubic pain, dysuria, hematuria, turbid urine, strangury, and pain radiating to the penis, groin, or thighs remarkably parallel modern clinical descriptions of renal, ureteric, and vesical calculi. Likewise, the etiological factors described in Ayurveda, such as improper diet, suppression of natural urges, and neglect of purificatory procedures, can be correlated with risk factors

recognized in modern medicine, including high-protein or oxalate diets, metabolic disorders, urinary infections, anatomical anomalies, and low fluid intake. Ayurvedic classification of calculi into *Sleshmaashmari*, *Pittaashmari*, *Vataashmari*, and *Sukraashmari* shows close correlation with modern categories like phosphatic, urate, oxalate, and seminal calculi.

Pathogenesis is also explained in doshic terms: vitiated *Kapha* combines with *Vata* and *Pitta* to form concretions, a view that parallels the biochemical imbalance and crystallization processes of modern pathology. Thus, Ayurveda presents a unique yet complementary model for understanding urinary stone disease, with therapeutic emphasis on herbal preparations, lifestyle corrections, and purificatory measures, which might exert their effect by altering urine chemistry and preventing crystal aggregation.

The importance of *Basti* as a *Trimarma* has been highlighted in all classical texts. Acharya Sushruta regarded the bladder as an organ hosting *Prana*, while Charaka described its location amidst vital structures such as the rectum, scrotum, ureters, and seminal ducts, identifying it as a reservoir of urine. The analogy of rivers flowing into the ocean symbolizes the convergence of *Ambuvaha Srotas* into the bladder. Vagbhata emphasized surgical caution in procedures involving *Mutravaha Srotas*, warning that careless surgical intervention could be fatal, a principle still valid in modern urology. The clinical importance of bladder pathologies like rupture, retention, cystitis, and malignancies further underscores the relevance of Basti as a vital organ and marma.

From the perspective of marma therapy, *Basti Marma* is not only an anatomical site but also a functional center of *Prana*.[19] Marmas are regarded as reservoirs of life force and centers of physiological and psychological regulation. Trauma to *Basti Marma* has life-threatening consequences, reaffirming its classification as a vital marma. Modern traumatic injuries such as pelvic fractures, bladder ruptures, or ureteric tears carry prognostic outcomes similar to what Sushruta described centuries ago. Hence, the classical knowledge of *Marma Vigyana* retains its clinical significance in contemporary surgical practice, especially in trauma and urology.

In conclusion, the discussion on *Basti Marma* reveals that ancient Ayurvedic scholars had profound insights into the anatomy, physiology, and pathology of the urinary system.[20] While their descriptions were rooted in the language and concepts of dosha, dhatu, and srotas, they correlate well with modern understandings of renal physiology, stone formation, and

urinary pathologies. The recognition of Basti as a *Trimarma* highlights its anatomical vulnerability and functional indispensability. Today, with advanced diagnostic tools and surgical interventions, the management of urological diseases has evolved, yet the fundamental principles laid down by Ayurveda remain relevant. Further research into the anatomical, physiological, and biochemical aspects of *Mutravaha Srotas* with modern technology could enrich both traditional and contemporary medical sciences, offering integrative approaches for urinary health and trauma care.

## CONCLUSION

Basti is described in Ayurveda as a vital, hollow organ acting as a reservoir of urine, formed from the essence of Rakta, Kapha, and Pitta under the influence of Vayu, and derived from *Matrija Bhava*. Recognized as one of the *Kosthangas* and classified as a *Snayu Marma*, it is thin-walled, Alabu- or Dhanurvakra-shaped, and supported by siras and snayus. Acharyas consistently emphasized its anatomical and functional significance, comparing its filling process with that of an earthen pot. While Sushruta highlights its structural position and delicacy, Vagbhata underlines its vital role as a marma. The Trimarmiya Adhyayas differentiate functional disorders like *Mutrakrichha* and *Ashmari* from anatomical anomalies such as *Mutraghata*, reflecting the comprehensive understanding of urinary physiology and pathology in Ayurveda. Thus, Basti is both structurally and functionally central, holding immense significance in health, disease, and survival.

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