SUSHRUTA SAMHIA - A UNIQUE ENCYCLOPEDIA OF AYURVEDIC SURGERY

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ABSTRACT

The Sushruta samhita is a representative work of the Dhanwantariya sampradaya (ancient surgical school) of Ayurveda. It is an ancient Ayurvedic text on surgical techniques written by legendary Acharya Sushruta. Acharya Sushruta has a great contribution towards Ayurveda by giving such great literature. His principles, diagnoses and treatment retain their potency and truth even after a couple of millennia. Its importance is all the more great, since it is the only text now available on Shalya Tantra (surgery) most important branch of Ayurveda. It is the most ancient and authoritative document on this branch of medical science not merely of India but also of the whole world. For this credit goes to Kashiraja Divodasa Dhanwantari, Sushruta, Nagaraguna and Chandrata who were the preceptor, composer, reductor and amender respectively. Acharya Sushruta very beautifully elaborates various surgical procedures like Nasa sandhana, Aushtha Sandhana, Karnasandhana, Siravedha and treatment of Asthibhagna (fractures) and Sandhibhagna (dislocation). Because of seminal and numerous contributions to the science and art of surgery Acharya Sushruta is also known by the title “Father of Surgery.” It is being studied since long by all Ayurvedists but very few conceptual works has been carried out on
selected part of this samhita. Therefore it becomes very essential to study and understand the various special features mentioned in Sushruta Samhita. This review article deals with the historical study of such great personality of Ayurveda and his unique contribution in the field of Ayurvedic surgery.

KEYWORDS: Ayurveda, Brihattrayee, Sushruta Samhita, Shalya tantra, Father of Surgery.

INTRODUCTION
Ayurveda is the most ancient indigenous medical system of India. Ayurveda is not merely a medical science but it is a science of life. Ancient and Classical text of Ayurveda namely Charak Samhita and Sushruta Samhita, two authentic text which were written centuries ago representing Kayachikitsa (medicine) and Shalya Tantra (surgery) respectively stands unchanged even today for their originality and quality. Charak samhita expounding the practice and philosophy of the ancient system of medicine, while the Sushruta Samhita is concerned with its surgical aspects. Acharya Charak and Acharya Sushruta have shown the path to achieve the long coveted goals of a long and healthy life. The Charak Samhita and the Sushruta Samhita enjoy a place of pride and honor among the Ayurvedic fraternity. Charak samhita, Sushruta samhita and Vagbhata samhita are considered as the most important samhita of Kritayuga, Dwaparyuga and Kaliyuga respectively. It is included in the list of three mostly authentic samhita of Ayurvedic science which are known as “Brihattrayee” and held in high esteem since many millennia.

Sushruta Samhita is the first and foremost authentic text of Ayurveda in the specialty of surgery written in the holy city of Kashi around 1000BC by Acharya Sushruta who was primarily a surgeon and recognized as The Father of Surgery in the world. Sushruta Samhita mainly deals with management, prevention and treatment of surgical aspect contains the description of both Shalya (surgery) and Shalakya (E.N.T.). The Sushruta samhita is divided into two parts, first one is known as the Purva-tantra (have total five sections) and the second one is known as the Uttara-tantra. Together, these two parts cover all the other specialties such as the medicine, geriatrics, pediatrics, aphrodisiacs, toxicology diseases of ENT and eye and psychiatry. Hence, The Sushruta samhita is an encyclopedia of the medical learning for doctors with special importance on the Shalya and Shalakya. Sushruta samhita has passed through the following four stages in its completion.
1. 1st stage :- Bhagwan Dhanwantari expounding the knowledge of Ayurveda and Vridha Sushruta compiled the Soushruta tantra
2. 2nd stage :- Acharya Sushruta redacting Soushruta tantra
3. 3rd stage :- Sushruta samhita is again redacted by a Acharya Nagarjuna
4. 4th stage :- Sushruta samhita is again redacted by a Acharya Chandrata

MATERIALS AND METHODS
This is conceptual type of research. All sorts of references has been collected and compiled from various available Ayurvedic classics texts like Sushruta samhita and available commentaries on it. This research article is also searched from various websites related to Sushruta samhita. All matter is analyzed for the discussion and attempt has been made to draw some conclusions.

About Acharya Sushruta
The word 'Sushruta' indicates, ‘Su - well, and Shruta - informed' - that is, 'a well informed or learned person'. Ayurvedic texts present Sushruta as a son of sage Vishvamitra and descendant of Divodasa Dhanwanatari, the king of Kashi a sacred Hindu place located in Northern India.

Acharya Sushruta has not mentioned his birth place and proper introduction anywhere in Sushruta samhita which create curiosity among various historical and Ayurvedists. But he quoted south region of India.

NATURE AND COMPOSITION OF SUSHRUTA SAMHITA
The Sushruta samhita is a huge treatise on ancient Indian medicine. It was written in Sanskrit language. It is a voluminous text composed in both prose and poetry form. Poetry was known to serve as a memory aid. In Sushruta samhita, the total number of prose passages and verses together is 8500 approximately. Sushruta samhita consists of 186 adhyayas (chapters). In Sushruta samhita, Adhyayas are divided into 6 sthana (sections). Each Sthana is further divided into numerous chapters. Arrangement of chapters is as follows –

Table No. 1 Arrangements of chapters in Sushruta samhita is as follows

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Sthana</th>
<th>Total chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sutra sthana</td>
<td>46</td>
</tr>
<tr>
<td>2</td>
<td>Nidana sthana</td>
<td>16</td>
</tr>
<tr>
<td>3</td>
<td>Sharira sthana</td>
<td>10</td>
</tr>
</tbody>
</table>
CONTENTS AND BRIEF INFORMATION ABOUT EACH STHANA

Sutra Sthana

Sushruta samhita starts with Sutra Sthana which deals with various important fundamentals and basic principles of Ayurveda. This Sthana deals with origin of Ayurveda, description of different branches of Ayurveda and its significance. Here there is a collection of various important shlokas related to various context are described. This sthana consists of total 46 chapters. There is detail description of various surgical appliances, instruments, their names, shapes, and methods of use are also described. He very beautifully mention importance of practical training by performing surgical acts on dummies according to the situation is been nicely explained. Sutra Sthana also deals with topics including – preliminary preparations for surgery, various types of instruments essential for surgery, use of kshara (alkalis), agni (fire cauterization), jalouka (leech application), daha karma (cauterization), collection and preservation of medicinal herbs, administration of emetics and purgatives, various types of food substances etc. Over all in section basic principles as such code of conduct of Vaidya, introduction to instruments, their uses, preparation of antiseptic medicines, methods of bandaging, dressings, prognosis and seasonal regimen is mentioned.

Nidanasthana

This is the second Sthana of Sushruta samhita. This Sthana consists of total 16 chapters dealing with Nidana (etiology), Samprapti (pathogenesis), Purvarupa (prodromal sign and symptoms), Rupa (Clinical features) and prognosis of the diseases which are major and exclusively important than surgical diseases. In this sthana only 16 diseases are described. They are – Vatavyadhi Nidana (Diagnosis of Diseases of nervous system), Arsha Nidana (Diagnosis of ano-rectal diseases), Ashmari Nidana (Diagnosis of renal calculi), Bhagandhara Nidana (Diagnosis of Fistula in ano), Kushtha Nidana (Diagnosis of Leprosy and other skin diseases.), Prameha Nidana (Diagnosis of Diabetes mellitus), Udara Nidana (Diagnosis of Enlargement of abdomen), Mudhagarbha Nidana (Diagnosis of Foetal obstruction), Vidradhi Nidana (Diagnosis of Abscess), Visarpa-Nadi-Stanaroga Nidana (Diagnosis of Erysipeals sinus, ulcer and diseases of breasts), Granthi- Apachi-Arbuda-Galagandha Nidana (Diagnosis of Benign Tumor, Cervical Metastasis, Malignant tumor and
cervical lymphadenitis), Vriddhi-Upadansha-Shlipada Nidana (Diagnosis of enlargement of scrotum, Veneral diseases and Filariasis), Kshudra Roga Nidana (Diagnosis of minor diseases), Shukdosha Nidana (Diagnosis of diseases of the penis) Bhagna Nidana (Diagnosis of Fractures and dislocations) and Mukha Roga Nidana (Diagnosis of diseases of Mouth) etc. are covered.

**Sharirasthana**
This is the third **sthana** of Sushruta samhita. It comprises of total 10 chapters. In this **sthana**, there is a detail description of fundamental and basic concepts of human anatomy, physiology, embryology and genetics. In this sthana instruction for venesection (cutting of veins), the positioning of the patient for each vein in treating various disorders has been anatomically explained. In this section one of the important chapter is about *Marma sharir*. *Marma* is the vital part of human body which is important from surgical point of view. Protection of marmas (vital organs) is also mentioned in detail. It also describes nature of human being, nature of mind and causes of diseases.

Description of quality of *Shukra* (semen), fertilization, menstrual cycle, ovulation, have been explained from embryological view. Concept of sex determination, *Garbha vridhdi* (fetal development), factors responsible for fertility, infertility and factors responsible for quality pregnancy is been described here. Monthly development of the embryo, factors injurious to the growth of embryo and sign of bicardic stage of pregnant woman is also described. Description of organs and parts of the human body is also furnished here. *Kaal* and *akaal mritu* (timely and untimely death) and factors responsible for the maintenance of normal span of life is explained in detailed.

**Chikitsasthana**
This is the fourth **sthana** of Sushruta samhita. This Sthana consists of total 40 chapters. In this **sthana**, treatment of various diseases Such as *Vrana* (ulcer), *Sadyovrana* (Sores or wound), *Bhagnas* (Fractures and dislocations), *Arsha* (Piles or Haemorrhoids), *Ashmari* (Urinary calculus), *Bhagandhara* (Fistula in ano), *Kushtha* (Diagnosis of Leprosy and other skin diseases.), *Prameha* (Diagnosis of Diabetes mellitus), *Udara* (Diagnosis of Enlargement of abdomen) is described in detailed. *Kshinabaliya Vajikarana Chikitsa* (Aphrodisiac Therapy) and *Sarvopaghata Shammiya Rasayana Chikitsa* (Rejuvenation Therapy) are also described here. Descriptions and complications of enema therapy, Smoke inhalation, Nasal medications and gargling therapies are also well explained.
Kalpasthana

This is the fifth sthana of Sushruta samhita. This Sthana contains total 8 chapters. The Kalpa Sthana is generally known as the Visha tantra which describes the nature of poisons as well as the management. In this Sthana there is a detail description of various types of poisonous foods, drinks, vegetables, minerals and various poisons of animals. Along with this symptoms and poisonous effect along with its treatment is beautifully mentioned in this Sthana. With this there is a wide description of snake bite poisoning, bites of animals like dog, rat or mice, wolf and fox has been described along with its treatment.

Uttaratantra

Uttara Tantra is 6th and the last division of Sushruta Samhita which has not been composed by Acharya Sushruta. It is believed that Uttara Tantra is addition to main treatise contributed by its redactor, Nagarjuna. It deals with various other subjects which were not discussed in the earlier divisions covered in 66 chapters. The Uttara tantra contains the remaining four specialties namely Shalakya (ENT), Kaumarbhritya (Pediatrics), Kaya Chikitsa (General medicine) and Bhutavidhya. The Uttara tantra is entirely known as the Aupadravika since many complications of surgical procedure as well as Jwara (fever), krimi- roga (worm infestation), pandu (anaemia), Atisara (dysentery), Kasa (cough), kamala (jaundice) etc. are briefly described here. Major description of Shalakya Tantra is available in Uttar Tantra of Sushruta Samhita and some description in Nidana Sthana and Chikitsa Sthana.

SPECIAL FEATURES OF SUSHRUTA SAMHITA

- Sushruta samhita stands strongly as a representative of one branch of Ayurveda known as Shalya Chikitsa (Surgery). It is composed in poetic format which becomes easy to memorize the quotations.
- Plastic surgery is the unique contribution of Acharya Sushruta for which the whole world is indebted to him.
- Acharya Sushruta has mentioned five types of Asthi (bones). They are – Kapala (flat bones), Ruchaka (teeth), Taruna (young ), Valaya (curved or irregular bones) and Nalaka (tubular bones).[1]
- According to Acharya Sushruta, Vaidya (physician), Rogi (patient or sick person) Bheshaja (proper drug) and Paricharak (compounder or nurse) these are the four limbs of treatment and responsible for its success. These four factors equipped with good qualities, will able to cure even a great diseases, within a short time.[2]
• Acharya Sushruta was very well aware of the Ashmari (urinary stones) and the anatomy of Basti (urinary bladder) along with its relations is well described in the chapter “Ashmarichikitsitopakramah”. Along with this variety of stones, their signs and symptoms, the method of extraction and operative complication are given in detail.[3]

• Acharya Sushruta emphasizes in his text that he who studies any one science only, will not be able to arrive at a correct decision, hence the physician should be in know of relevant sister branches of sciences.[4]

• According to Sushruta, Shastra karma (surgical activity) is of eight types. They are Chedya (incision), Bhedya (separating), Lekhya (scraping), Vedhya (puncturing, piercing), Eshya (probing), Aaharya (extracting, pulling out), Visravya (draining of fluid), Sivya (suturing, sewing).[5]

• Sushruta mentioned five characteristics of ideal Vrana as Aayata (adequate length), Vishal (adequate width), Suvibhakto (edges seperated), Nirashraya (absence of hollow space inside) and Praptakalakruta (at the proper time).[6]

• Acharya Sushruta mentioned that intelligent physician should remove the bandage after three days in Hemant (dewy), Shishira (winter season) and Vasanta ritu (spring), and after 2 days in Sharad (autumn), Grishma ritu (summer) and Varsha Ritu (rainy season).[7]

• Acharya Sushruta has elaborately described six types of Sadyo vrrana (Traumatic Wounds or sores) caused by weapons of variously shaped edges in the different parts of human body. They are (1) Chinna (cut) (2) Bhinna (punctured), (3) Vidhha (pierced), (4) Ksata (crushed), (5) Picchita (contused) and (6) Ghrista (lacerated).[8]

• Acharya Sushruta has elaborately explained about Dagdha vranas (kinds of burns) and classified them into four types like Plushta Dagdha (scorched burn), Durdagdha (blistered burn), Samyak Dagdha (superficial burn) and Atidagdha (severe or deep burn).

This knowledge of the features of these four kinds of burns will be helpful for physician for performing his activities (treatments).[9]

• Acharya Sushruta has also explained the treatment of Dagdha vranas in detail.[10]

• Acharya Susruta has described the features of a healthy person. According to him, Health is in balance when all three doshas (Vata, Pitta and Kapha) are all in equilibrium, Agni (digestive fire) are in a balanced state and the dhatus (tissues) and proper elimination of malas (wastes) are in proper order. When atma (soul), senses and Mana (mind) are also in a Prasanna avastha (pleasant state) Such a person is called a Swastha purusha (healthy
person). This definition of ‘Swastha (healthy)’ given by Acharya Sushruta is ideal one even today.[11]

- The descriptions of Marmas (vital spots) given elaborately in a separate chapter is unique which has applied importance in surgery. Acharya Sushruta had described 107 Marmas (Vital spots) in the body which causes fatal result when injured.[12] Sometime either sudden death or subsequent permanent deformity of body organ. These Marmas are divided into Mamsa Marma (muscular vital spots), Sira Marma (venous vital spots), Snayu Marma (ligamental vital spots), Asthi Marma (bony vital spots) and Sandhi Marma (joints vital spots).[13]

- Acharya Sushruta emphasizes that unless physician possess enough knowledge of relevant sister branches of learning, he cannot arrive at a correct decision. Hence the physician should be in known of many sciences.[14]

- **Surgical instruments**

  Acharya Sushruta has described 101 types of Yantras[15] (blunt instruments) and 20 types of Shastras[16] (sharp instruments). The unique classification of surgical instruments as Yantras and Shastras holds good even today. He had also considered the importance of hand as the Pradhana yantra (most important) because without the hand, instruments cannot be used at all. All the functions of the instruments are dependent on hand.[17]

- Yantra (blunt surgical instruments) are divided in major six categories.[18] They are –

  **Table No. 1 Showing classification of Yantras**

<table>
<thead>
<tr>
<th>Sr. No</th>
<th>Ayurvedic Name</th>
<th>Modern name</th>
<th>Total no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Swastik yantra</td>
<td>cruciform instruments</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Samdamsha yantra</td>
<td>pincers, forceps etc</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Tala yantra</td>
<td>instruments with flat discs</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Nadi yantra</td>
<td>tubular instruments</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Shalaka yantra</td>
<td>Rods, rod like instruments</td>
<td>28</td>
</tr>
<tr>
<td>6</td>
<td>Upayantras</td>
<td>accessory instruments</td>
<td>25</td>
</tr>
</tbody>
</table>

- Names of Yantras these are given as per their shapes resembling to the animals, birds etc. e.g., Simhamukha (Lion Forceps), Shararimukha (like Sharari bird -Scissor) etc.

- 20 Shastra (Sharp Instruments) have been mentioned by Sushruta which are employed in Shastra karma (main operative procedure). These are – Mandalagra shastra (round knife, sharp curette), Karpata (surgical saw), Vridhipatra (bistuar), Nakha (nail), Mudrika (finger knife), Utpalapatra (lancet), Ardhadhara (curved lancet), Suchi (surgical needles) Kushpatra
(long double edged scalpel), Aatinukha (short scissors), Shararimukha (long scissors), Antarmukha (curved lancet), Trikurchaka (brush like sharp spike in three sides), Kutharika (surgical axe), Vrihimukha (trophar), Ara (awl), Vetaspatra (scalpel), Badisha (sharp hooks), Dantashanku (teeth scraper), Eshani (sharp probe). [19]

- **Bhagna And Sandhimukta (Fractures And Dislocations)**
  
  In Sushruta Samhita, Acharya Sushruta has given detailed description about bones, its fracture and dislocation and treatment of fractures and dislocations have been covered in detail. He mentioned six types of sandhimukta [20] (dislocations of joints) and twelve varieties of kanda-bhagna [21] (fractures). Along with this, treatment of Avrana bhagna (closed fracture), Savrana bhagna (open fracture) and Sira kapala bhagna (fracture of skull) are well explained. He gives the principles of fracture treatment viz. Anchana (traction), Pidana (compression or manipulation), Samksepa (immobilization) and bandana (bandaging or immobilization by splints and bandaging) are mentioned. This classification and description by Acharya Sushruta is being followed even at present.

- **Yogya (Practical Training)**[22]
  
  According to Acharya Sushruta, only theoretical knowledge of surgery is not enough for surgeon. In spite of having a good hold on surgical theory, one has to undergo extensive training and get practical exposure until he can confidently handle surgeries. Acharya Sushruta described various surgical demonstration techniques in “Yogyasoothreeya adhyaya”. According to him, before conducting the surgery on the human being, it should be practised on props and artificial objects like – Different kind of Chedana (Excisions) should be demonstrated on fruits and vegetables like alabu (cucumber, gourd etc). Bhedana (Incisions) should be practiced on the urinary bladders of dead animals, leather bags, leather sac etc. Lekhana (Scraping) by using the animal skin covered with hairs. Sira vedhana (Venesection) should be practised on veins of dead animals and stalks of water lily (kamala, kumuda) plant etc. Aaharana (Extraction) should be practiced on the fruit pulp of Bilwa majja (Aegle marmelos), panasa, bimbi. Shivana (Suturing or sewing) should be practiced on thick piece of cloth or soft skin (leather). Bandhana (Bandaging) should be demonstrated on full sized human models of clay or cloths. Practical training on application of cautery and caustic alkali should be given on soft pieces of meat or on soft muscles. These various techniques helps surgeon to obtain proficiency, acquiring skill and speed in different surgical procedures.
• **Consent before Surgical Treatment**

*Acharya Sushruta* has mentioned the importance of taking consent in the chapter of “*Ashmari Chikitsa”*. According to him, if surgical treatment is not performed patient death is sure and if done, the result is uncertain and there is doubt between life and death of patient, then surgery should be done only after obtaining consent of the well wishers of the patient.\(^{[23]}\)

• **Diet Restriction**

Generally operation should be done after the patient has taken light food. But in diseases such as *Moodha garbha* (obstructed foetus), *Udara roga* (abdominal enlargement), *Arshas* (piles), *Ashmari* (renal calculus), *Bhagandara* (Fistula in ano), *Mukha roga* (Diseases of the mouth), surgical operations should be done when the patient has not taken any type of food by mouth. Even now we can see that surgeries are usually performed by nil orally.\(^{[24]}\)

• **Consent for Performing Surgery**

*Acharya Sushruta* mentioned that, after compilation of the study of the texts and before going to start practice of medicine or surgery, the medical graduate should obtain the permission from the king (government). Obtaining the permission from the king is suggestive of the existence of rules regarding control and regulation of medical practitioners even during ancient times similar to the registration of medical practitioners of the present day.\(^{[25]}\)

• **Qualities of a Surgeon**\(^{[26]}\)- According to *Acharya Sushruta*, ideal surgeon should possess the following qualities.

1. *Shourya* (courage or boldness)
2. *Aashukriya* (quickness in action)
3. *Shastrataishnyam* (having sharp knife and other useful instruments)
4. *Aswedavepthu* (he should be non-shaking, non-sweating.)

These qualities are alike as Lion’s Heart, Eagle’s eyes & Ladies finger, etc. as mentioned in modern era. For acquiring above mentioned qualities practical training is very much important and for this purpose a number of models were created to learn the procedures before applying directly them on humans.

• **Shava Chedana (Dissection of The Human Cadavers)**\(^{[27]}\)

*Acharya Sushruta* was the first medical person in the ancient world who had described the preservation of deceased and dissection of dead bodies in the scientific manner to learn
minute human body structure and human anatomy. He also described different body parts like skin and membranes, muscles, tissues, bones and joints, blood vessels and vital spots elaborately as well as minutely. These descriptions of different body parts reflect the sound knowledge of the surgeons of those days. A description of the method of dissecting dead bodies is considered as a most important contribution of Acharya Sushruta to the modern surgery.

- **Shava Chedana Vidhi (Procedure of Dissection of Human Cadavers)**[28]
  According to Acharya Sushruta, for dissecting purposes, a cadaver should be selected having whole parts of the body, person who not died by either poisoning or long standing (chronic) diseases, had not attained hundred years of age and from which fecal contents from intestine have been removed. Such cadaver whose all parts are wrapped carefully either with munja grass, Valkala (inner part of trees), Kusha grass or any such material tied well and placed inside a cage. The cage should be kept in a slowly flowing river and allowed to undergo putrification in unlighted area. After proper putrification foe seven nights , the cadaver should be taken out from the cage and then dissected slowly by rubbing it with the help of brushes made from Ushira grass, Venu (bamboo), Balvaja (a kind of grass) or any other similar material. By this way major and minor parts of human body could be visually examined.

- **Ashaya (Place of residence)**[29]
  In Sharir Sthana, Acharya Sushruta has described seven Ashayas in male body – Vatashaya (seat of Vata), Pittashaya (seat of pitta), Shleshmashaya (seat of Kapha), Raktashaya (seat of blood), Amashaya (seat of undigested food), Pakwashaya (seat of digested food), Mutrashaya (seat of urine) and extra one i.e. eight Ashayas in female body - Garbhashaya (seat of foetus).

- **Kalabheda (kind of membranes)**[30]
  Acharya Sushruta has described 7 types of Kala (cell membrane) which gives rise to further differentiation of various tissues and organs. These are – (1) Mamsadhara kala (2) Raktadhara kala (3) Medodhara kala (4) Shleshmadhara kala (5) Purishdhara kala (6) Pittadhara kala and (7) Shukradhara kala.

- **Asthi (Bones)**[31]
  Acharya Sushruta classified bones based on dissections as Kapala (flat bones), Ruchaka asthi (teeth), Taruna asthi (cartilages), Valaya asthi (round bones) and Nalaka asthi (long bones). He gave 300 as the total number of Asthi (bones) in the body – 120 Asthi in Shakha, 117 in
the *Shroni* (pelvis), *Parshava* (flanks), *Prishtha* (back) and *Uras* (chest), 63 in *Greeva* (head-neck). He has even elaborated the number and place of these bones.

- **Dhatu (Body tissue)**\(^{32}\)

According to *Acharya Sushruta*, there are 7 basic types of dhatus in a human body. They are – *Rasa* (nutrient material), *Rakta* (blood), *Mams* (muscle), *Meda* (fatty tissue), *Asthi* (bones), *Majja* (bone marrow), *Shukra* (semen).

- **Srotas (External openings)**\(^{33}\)

*Sushruta* has given 9 srotas in males. They are – *Shravana* (ear) two, *Nayana* (eyes) two, *Vadana* (mouth) one, *Ghrana* (nasal openings) two, *Guda* one (anus), *Medhra* (penis/urethra) one. These and 3 more- two in the *Stana* (breast) and one in *Artavaha srotas* (vaginal). Are extra in females.

- **Twacha (layers of Skin)**\(^{34}\)

*Acharya Sushruta* described 7 layers in *Twak* (skin) which includes skin and subcutaneous fat etc. They are – *Avbhasini* (*Stratum corneum*), *Lohita* (*Str. lucidum*), *Shweta* (*Str. granulosa*), *Tamra* (*Str. spinosum*), *Vedini* (papillary layer), *Rohini* (reticular layer), *Mamsdhara* (Adipose layer). The First four will cover the skin layers described in modern anatomy. Other three layers come under subcutaneous fat and tissues.

- **Management of Pain**\(^{35}\)

Patient is advised to consume food before undergoing any surgical procedure in order to tolerate the pain during operation. In the presence of food he does not faint and does not understand the pain. Hence the patient should be given food necessarily before doing surgical activities. *Acharya Sushruta* was the first person who advice strong wine to alleviate the pain during the surgery.

- **Vranitagar (ward for wounded)**\(^{36}\)

*Acharya Sushruta* directs that there should be a separate room for patients who have undergone surgical procedure. This room should be a clean, situated in a wholesome locality, free from dirt and direct sunlight and heavy breeze so that the person will not suffer from physical, mental and traumatic disorders. The bed of the wounded person should be soft and wide, convenient for easy movements of body parts and well-arranged with head placed to the east direction (since the gods reside in the east) and weapons inside (for protection from
enemies, animals etc.). In that room, the wounded person should reside, served by affectionate friends and attendants who talk pleasingly with him. The surrounding of friends will drive away the discomfort (pain) of the wound.

- **Raktastrava nirodha karma (Methods of preventing bleeding)**[37]

Acharya Sushruta has given four methods to prevent excessive bleeding occurring after *Siravedhan* (puncturing of vein). They are – *Sandhana* (joining the edges of the wound by use of astringent drugs), *Skandhan* (promoting clotting by use of cold), *Pachana* (stytptics by use of ash, alkali etc.) and *Dahana* (burning or cauterisation). Kashaya drugs (Astringents) joins or unites the edges of the wound, *hima* (cold) makes the blood to clot, *bhasma* (ash) cooks the wound and *daah* (thermal cauterization) constricts the veins.

**Commentaries on Sushruta Samhita**

*Sushruta samhita* is studied and referred by many students, teachers, research workers and physician who are practicing Ayurveda all over the country and abroad. Considering the importance of *Shalya - Chikitsa*, many scholars have composed their commentaries in Sanskrit and other languages. Out of them many commentaries are lost and very few are available in incomplete condition. From various sources and citation it came to notice that more than 19 Sanskrit commentaries were written on *Sushruta samhita*. The following are the commentators with their work. It is our bad luck that we have lost many valuable commentaries on this most important treatise. Since the greatness of *Sushruta samhita* has spread too many countries therefore it is translated in almost all regional languages of India and also of some other countries.

So far about 19 commentators are known, having been mentioned by *Dalhana* and so earlier 12th cent AD. *Nibandha Samgraha* the only ancient commentary available now in full and in print is that of *Acharya Dalhana*. Two other commentaries available now in incomplete form are:

1. Nyavachandrika or Brihat Phanjika of Gayadasa (10th cent AD) for *Nidana Sthana* only.
2. Bhanumati of Chakrapanidutta (11th cent AD) for Sutra Sthana only.

Another recent commentary in Sanskrit is that of Haranachandra Chakravarti son of Anandachandra Chakravarti and disciple of Kaviraj Gangadhara Roy. His commentary is known as “*Sushrutatha Sandipana*” which is very important to understand *Sushruta samhita*. 
English Translations of *Sushruta samhita*

Some sections of the text have been translated to English language by U.C. Dutta in 1883, A.C. Chattopadhyaya in year 1891 and A.F.R. Hornele in year 1897. English translation of the full text has been done by Kaviraja Kunjalal Bhishagrata (1907) in 3 volumes, which is available now. Prof. P.V. Sharma along with commentary of Dalhana 1999. and K.R. Srikanthamurthy (2000) is being published.

Hindi Translations of *Sushruta samhita*

Due to its importance and practical applicability, *Sushruta Samhita* has been translated into Hindi language by many authors. Some such important ones are -

1. Kashinatha pandey and Gorakhanath Chaturvedi (Vidhotini Tika)
2. Dr. Brahmanand Tripathi (Charak Chadrika)
3. Ravidutta Tripathi (Vaidyamanorama)

Translations *Sushruta samhita* in other language

*Sushruta samhita* has attracted the attention of scholars of other countries also from early days. Owing to its popularity, importance & practical applicability the Sushruta Samhita has been translated into many other languages such as Arabic, Latin and German. Some such important ones are –

1. Ibn_Abila_sibal (9th cent AD) translated *Sushruta samhita* into Arabic language under the name “Kitab sashool-e-Hind” or “Kitab-e-Susrud”. This has been referred to by Al- Rhazi (Rhazes) the famous physician, as an authority of surgery.
2. F. Hesslar has translated *Sushruta samhita* into Latin language in year 1844 and into German language in year 1846 by J.A. Vullars.

CONCLUSION

The *Sushruta samhita* is famous as one of the remarkable accomplishments of ancient Indian science and *Acharya Sushruta* is the most celebrated physician and surgeon in India. *Sushruta samhita* provides us simple, precise logical and practical keen knowledge on various Surgery related topic. Through his genius and intuition, *Acharya Sushruta* made landmark contributions to Ayurveda. *Sushruta samhita* covers all aspects of medical science with special importance to *Shalya Chikitsa* and remains par excellent on that subject. The contribution of *Acharya Sushruta* to surgery has laid the strong foundation for Modern Surgery. *Acharya Sushruta* has covered every topic related to surgery right from the dissection, anatomical consideration to the description of diseases and management which are
being used with same basic principles in today’s surgical era with modification and amendments.

His contribution towards the Indian traditional medicine and the ancient cultural heritage of India will always be a precious. *Sushruta Samhita* is the key reference book for all the Ayurvedic surgeons. Due to his renowned and wonderful achievements in the field of surgery, *Acharya Sushruta* is rightly called as the “Father of surgery” & “Father of Plastic surgery”. Therefore considering the above all facts it is concluded that *Sushruta Samhita* is A unique encyclopedia of Ayurvedic Surgery.

**REFERENCES**