



A GLIMPSE OF CONTRIBUTIONS OF ACHARYA SUSHRUTA IN SURGERY

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ABSTRACT

Sushruta Samhita describes the ancient tradition of surgery in India and is considered as one of the brilliant gems in ancient Indian medical literature. This treatise contains detailed descriptions of way of teaching and practice of surgery by our great ancient surgeon, *Acharya Sushruta*, who had wide knowledge of surgery which has got relevance even in today's modern practice of surgery and other related surgical and medical branches. *Sushruta* was the famous surgeon of Kashi, known as Banaras. He used to teach and practice around 600 BC. and has made significant contributions to various branches of medicine. *Sushruta Samhita* written by him is the foundation of Indian traditional system of medicine and it contains 186 chapters in which he has given

description of 1120 diseases, 700 medicinal plants, 64 preparations from mineral sources and 57 from animal sources. He has given precise description of method of dissection, preservation of Cadaver, types of suturing and suture material used, *Yantra-Shastra* (instruments), minor and major operative procedures, *Bhagna* (fracture and dislocation), *Kaumarbhritya* (paediatrics), *Twaka Vikara* (skin diseases), *Panchkarma*, and many more in addition to his well known work of plastic surgery. *Sushruta Samhita* is considered as the landmark in the field of surgery and *Acharya Sushruta* is glorified as "Father of Indian Surgery". He performed surgeries in the era when no diagnostic facilities were available. Probably, it was his wide knowledge of basic science which made him such a versatile surgeon. The list of his contributions is never ending. In this review an attempt has been

made to highlight the ancient surgical concepts of *Sushruta Samhita* which are being practiced even today with same basic principles but after modifications and amendments.

KEYWORDS: *Sushruta, Shalya, Shastra karma, Surgery.*

INTRODUCTION

When we list out the first to contribute in surgery, *Acharya Sushruta's* name comes first. *Sushruta Samhita*, the ancient tradition of surgery in Indian medicine, is a gem in Indian medical literature. *Sushruta* took surgery in medieval India to admirable heights and that era was later regarded as “The Golden Age of Surgery” in ancient India. Because of his numerous seminal contributions to the science and art of surgery in India, he is regarded as the 'Father of Indian Surgery' and the 'Father of Indian Plastic Surgery'.

Acharya Sushruta mentioned that even after the science has been studied, if it is not properly interpreted in its meaning then it will only cause exertion just like the ‘donkey carrying load of sandalwood ignorant of its value’.^[1] He believed that knowledge of both surgery and medicine are essential to constitute a good doctor. He also emphasized that unless one possesses enough knowledge of relevant branches, one cannot attain efficacy in own subject and will not be able to arrive at a correct decision.^[1] According to him, the one who practices medicine after learning science from a preceptor and engages constantly in recapitulating it, can be called a physician whereas all others are imposter.^[1] A complete review of *Sushruta Samhita* reveals the concepts and contributions of *Acharya Sushruta* in the field of surgery. Here are some of the contributions of this great surgeon towards the fascinating field of surgery.

1. Technique of training in Surgery

At that time medical education was being inculcated by method of *Gurukul* system. This science has been handed over in traditional way of teaching through faithful hands that have enlightened the lamp of knowledge one after the other and kept its sacred flame bright from one generation to the next.

(a) Selection of Student

The student was selected entirely on personal merit, irrespective of caste. He should be in *Taruna* stage(15-30 yrs) having sound physical and mental habits, pleasant manners, retention capacity, humility, forbearance, fortitude, belonging to good family etc.^[2]

Upanayana vidhi (initiation ceremony) and taking oath

The admission is marked by *Bali*, *Mangala* and *Homa* (prayer, worship and sacrificial offering). *Upanayan sanskara* is performed for this training. In front of oblation fire, *guru* administers oath in presence of all scholars, enjoining him to absolve from heinous acts of improper affection, miserliness, anger, arrogance, jealousy, discourtesy, to observe clean habits and celibacy, to speak truth, to respect and obey the teacher etc. The teacher himself also makes promise to discharge his duty consciously.^[3]

(b) Curriculum for Study

After *Upanayana Samskar* (initiation ceremony), student is introduced to the syllabus he has to carry out. Except 1st, 8th, 14th and 15th lunar days, rare occasions of religious and political importance, rest of the days are considered as working days for the study.^[4] The text is taught slowly according to the capacity of each student. The teacher should instruct them every word, part of a verse or a full verse, according to their ability and make them repeat many times.⁵ All the verses should be explained by the teacher and understood by the student completely.^[6] Theoretical knowledge alone can do nothing without practical knowledge and vice-versa was the thought of *Sushruta*. Students were therefore provided both theoretical and practical knowledge. Without lethargy the student should devote his entire attention on studies, strictly following the preceptor in order to complete his curriculum. To understand the subject better, one has to study under the specialists, for knowledge of one science alone is not sufficient to have command over it unless it is supported by an insight into as many allied disciplines as necessary. So *Sushruta* advised to be ever seeking new frontiers of knowledge by studious habits, discussion and perusal of other works on allied subjects.^[7]

(c) Quality of a Surgeon

For a successful surgical manoeuvre, the surgeon should have courage, quickness in action, should be non-shaking, non-sweating, (self confidence and self command), should have sharp instruments.^[8] The qualities are alike as Lion's Heart, Eagle's eyes, Ladies finger, etc. as mentioned in modern era. For acquiring these qualities practical training is very essential and for this purpose a number of models were created to learn the procedures before applying them on humans.

(d) *Yogya* (Practical training)

Sushruta mentions the importance of practical knowledge for a student: 'A pupil, otherwise well-read, but uninitiated, in the practice (of medicine or surgery) is not competent to take in

hand the medical and surgical treatment of disease.^[9] So he introduces the student to the primary techniques in surgical practice. All operative manoeuvre involve one or more of the eight varieties of *Ashtavidha shastra karma* (intervention) – *Chedana* (excision), *Bhedana* (incision), *Lekhana* (scraping), *Vyadhana* (puncturing), *Eshana* (probing), *Aharana* (extraction), *Visravana* (draining) and *Seevan* (suturing).^[10] To obtain proficiency, skill and speed in various surgical procedures, *Sushruta* devised various experimental modules. For example, *Bhedana* (incision) and *Chedana* (excision) are to be practised on vegetables and leather bags filled with mud of different densities; *Lekhana* (scraping) on hairy skin of animals; *Vedhana* (puncturing) on the vein of dead animals and lotus stalks; *Eshana* (probing) on moth-eaten wood or bamboo; scarification on wooden planks smeared with beeswax, etc.^[11]

(e) Methods of Examination and Approach to Diagnosis and Management

After obtaining practical training students are taken to bedside for examination of the patient. This is called *Vishikha* or *Karma marga*, the procedure for the clinical study. *Sushruta* has given six means for diagnosing a disease – *Shrota* (auscultation), *Sparsha* (palpation), *Chakshu* (inspection), *Jihwa* (by tasting), *Ghrana* (by smelling) and *Prashna* (interrogation).^[12]

With the help of above means combined with observation and inference, student will be able to decide the *Dosha* (causative factor) and *Dushya* (cellular structure) involved in a disease, whether the disease is *nija* (intrinsic) or *Aagantuja* (extrinsic) in origin and in what *Kriyakala* (stage of disease) the disease is, according to this the management will be decided, whether *Shodhana* or *Shaman* or *Karshana* or *Brimhana chikitsa* is to be applied, whether it needs *Shalya karma* (surgery), *Kshara karma* (chemical cauterization) or *Agni karma* (thermal cauterization).

(f) Consent for Performing Surgery: It has been mentioned that, before undertaking practice of medicine or surgery, the medical graduate had to obtain the permission of the king, as the head of the state, after satisfying him that the intending practitioner of medicine and surgery had been fully trained and qualified to do so.^[13]

(g) Augmenting Knowledge: *Sushruta* clearly stresses a Physician should augment his knowledge and ingenuity by never abandoning the habit of further study, discussion,

learning of allied sciences, expositions in group meetings and seminars.^[14] Thus, a surgeon of *Sushruta's* period was complete in himself, stood independent and confident.

2. Dissection of Dead body

For a surgeon, anatomical knowledge is the core of his study without which he is like a slaughter. *Sushruta* was the first person who had established the preservation of deceased and cadaver dissection in scientific manner to learn medical science. He explained the method of preserving the dead body and preparation before dissection. Method of dissection is precisely stated in the text, the same method is being used in a modified way today. *Sushruta* says anyone desirous of acquiring a thorough knowledge of anatomy should prepare a dead body and carefully observe (by dissecting it) and examine different parts. 'For dissecting purposes, a cadaver should be selected which has all parts of the body present, of a person who had not died due to poisoning, not suffered from a chronic disease (before death), had not attained a 100 years of age and from which the faecal contents of the intestines have been removed. Such a cadaver, whose all parts are wrapped by any one of *Munja* (kind of grass – *Saccharum munja Roxb.*), *Valkala* (bark – *Valeriana hardwicki wall / Coelus Vettiveroides ke Jacob*), *Kush* (kind of grass – *Desmostachya bipinnata (L.) Stapf.*) etc. and kept inside a cage, should be put in a slowly flowing river and allowed to decompose in an unlighted area. After proper decomposition for seven nights, the cadaver should be removed (from the cage) and then dissected slowly by rubbing it with the brushes made out of any of *Usira* (kind of grass – *Vetivera zizanoides (linn.) Nash*), *Vala* (hairs of tail of animals), *Venu* (*Bambusa arundinacae wild.*) etc'.^[15]

3. Anatomical Knowledge

The famous Sir Astley Cooper, President of the Royal College of Surgeons, said that 'without dissection there can be no anatomy, and that anatomy is our Polar Star, for without anatomy a surgeon can do nothing, certainly nothing well.'^[16] Acharya *Sushruta* has dealt with Human anatomy in the *Sharira sthana* and has paid great attention towards the structural organisation of the human body.

(a) Embryology

Sushruta has described not only the anatomical situations of various structures but he has also given the detailed description right from the cellular structure to the development of various tissues and organs, beginning from intrauterine during description of method of conception. *Sushruta* mentioned that at the time of intercourse there is liberation of *Tej* (energy) which

alongwith *Vayu* stimulates *Shukra* (spermatozoa) to enter the vagina, where it joins *Artava* (ovum). According to him *Shukra* (sperm) is *Somya* (cool) and *Artava* (ovum) is *Agneya* (warm). When this *Agni* combines with *Soma* in *Garbhashaya* (uterus), it gives rise to the origin and formation of foetus.^[17]

From time of conception, foetal development has been described according to gradual increase in size and shape. It is like a *Budbuda* (bubble) at the end of one month, becomes round like *Pinda* (small ball shape) and solidify at the end of second month. The differentiation of embryo takes place during third month, when it gives rise to the formation of 5 buds - two upper limbs, two lower extremities, head and neck. All these become well differentiated and heartbeat can be heard by fourth month. *Manas* (brain) is developed in the fifth month, *Budhi* (intellect) in sixth month, during seventh month all parts of body become well developed and *Ojas* becomes active during eight month. The delivery of the child occurs at the end of ninth or tenth month.^[18] He was also aware of diseases by genetic inheritance. He mentions many congenital defects acquired from parents and those resulting from indulgences of the mother during pregnancy. Therefore he advises her to avoid exertion for the perfect development of the foetus. Developmental and heredity concepts were known to *Sushruta*.^[19]

(b) Gross Anatomy

Garbha (embryo) is divided by *Vayu Bhuta* (air), cooked by *Tejas Bhuta* (fire), *Aap Bhuta* (water) moistens it, *Prithvi Bhuta* (earth) hardens it and *Akasha Bhuta* (space) enlarges it. Developed in this manner, when it becomes endowed with hands, feet, tongue, nose, ears, buttocks etc then it derives the name *Sharira* (body) consisting of the following^[20]

(i) *Kala* (Epithelial cell layers)^[21]

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* – This is connective tissue layer inside muscles e.g. aponeurosis, intermuscular septa.
- (2) *Raktadhara kala* – This is thin mucous membrane inside the arteries, vein, liver and spleen.
- (3) *Medodhara kala* – These are the membranes composed of adipose tissue such as omentum etc.
- (4) *Shleshmadhara kala* – These are seen in synovial membranes of joints.

(5) *Purishdhara kala* – These give rise to mucous membrane of small and large intestine

(6) *Pittadhara kala* – It forms mucous membrane of gall bladder, stomach and duodenum.

(7) *Shukradhara kala* – It gives rise to mucous membrane of testis, seminal vesicles, vas deferens prostate and epididymis in males, uterus, vagina ovaries and fallopian tubes in females.

(ii) Twacha (Skin)^[22]

Sushruta gave 7 layers of skin – *Avbhasini* (Stratum corneum), *Lohita* (Str. lucidum), *Sweta* (Str. granulosa), *Tamra* (Str. spinosum), *Vedini* (papillary layer), *Rohini* (reticular layer), *Mamsdhara* (Adipose layer). First 4 form epidermis and last 3 form dermis.

(iii) Anga & Pratyanga (Body division -Major & Minor parts)^[20]

Sharira (body) has 6 major parts, called *Shadanga* – 4 *Shakha* (extremities), *Madhya* (trunk) and *Shira* (head). Further *Pratyanga* (minor parts) are described as follows – *Mastaka* (head), *Udara* (abdomen), *Prishtha* (back), *Nabhi* (umbilicus), *Lalata* (forehead), *Nasa* (nose), *Chibuka* (chin), *Basti* (urinary bladder), *Griva* (neck) – these are 1 each; *Karna* (ear), *Netra* (eye), *Bhru* (eyebrow), *Shankha* (temples), *Ansa* (shoulder), *Ganda* (cheeks), *Kaksha* (axilla), *Stana* (breast), *Vankshana* (groin), *Vrishana* (testis), *Parshava* (flanks), *Sphika* (buttock), *Janu* (knee), *Karpura* (elbow), *Bahu* (arm), *Uru* (thigh) – are 2 each; *Anguli* (fingers and toes) are 20.

(iv) Ashaya (Internal organs)^[20]

7 internal organs has been mentioned in males – *Amashaya* (stomach), *Pakwashaya* (intestine), *Pittashaya* (gall bladder), *Vatashaya* (large intestine), *Shleshmashaya* (lungs), *Raktashaya* (spleen and liver), *Mutrashaya* (urinary bladder) and extra one in females (8) - *Garbhashaya* (uterus).

(v) Dhatu (Body tissue)^[20]

7 types of tissue are mentioned – *Rasa* (nutrient material), *Rakta* (blood), *Mams* (muscle), *Meda* (fatty tissue), *Asthi* (bones), *Majja* (bone marrow), *Shukra* (semen).

(vi) Srotas (External openings)^[23]

Sushruta has given 9 *srotas* in males – *Shravana* 2 (ear), *Nayana* 2(eyes), *Vadana* 1(mouth), *Ghrana* 2 (nasal openings), *Guda* 1(anus), *Medra* 1(penis/urethra) and 3 extra for females - *Stana* 2 (breast) and *Artavaha srotas* 1(vaginal).

(vii) Vascular system

The knowledge of circulation of vital fluids through the body was known to *Sushruta* in 6th century BC itself. He has differentiated the vascular system into vein, artery and lymphatic channels.

• Dhamani (Artery)

They are meant for carrying the nutrient material and are 24 in number. All of these arise from *Nabhi* (umbilicus) - 10 go in upward direction to supply head and neck, 10 go downwards to supply the trunk and lower extremities and the remaining 4 travel transversely to nourish upper extremities.^[24]

• Sira (Vein)

These are 700 in number and originate from 40 *Mula sira* (main branches) - 10 for *Vata*, 10 for *Pitta*, 10 for *Kapha* and 10 for *Rakta* and all 4 further divide into 175 each.^[25] *Vatawaha sira* are pinkish in colour and contain nutrient material, *Pittawaha* are bluish in colour and contain bile, *Kaphawaha* are white in colour and contain lymph.^[25]

(viii) Marma (Vital spots)

He described 101 number of *Marmas* (vital spots) in the body which causes fatal result on injury, either sudden death, haemorrhage or subsequent deformity. The detailed anatomical landmark of each and every *Marma* was described by *Sushruta*.^[26]

(ix) Netra (Eye)

Sushruta have mentioned 5 *Mandalas* [*Paksham* (eye lashes), *Vartam* (area of eyelids), *Sveta* (sclera), *Krishna* (cornea) and *Drishti* (pupil)], 6 *Sandhi* (joint, fornices), 6 *Patal* (layers) of the eye. *Netra budbud* (eyeball) is 2 *Angula* (finger breadth) depth, one's own thumb in width, 2 and 1/2 *Angula* (finger breadth) in circumference.^[27]

(c) Musculo Skeletal System^[28]

(i) Pesi (Muscles) – According to *Sushruta* there are 500 muscles in the body – 400 in extremities, 34 in head-neck and 66 in trunk. Females have 20 extra muscles according to *Sushruta* – 5 for each breast, 4 in *Apatyapath* (passage of fetus), 3 are attached to *Griva chidra* (mouth of uterus), 3 in *Shukraartava praveshani* (passage for menstrual blood and entry of semen).

(ii) **Kandara (Tendons)** – 16 tendons have been described – 4 in both *Pada* (foot) and same number in *Hasta* (upper extremities), *Griva* (neck) and *Prishtha* (back).

(iii) **Snayu (Ligaments)** – Total 900 *Snayu* are mentioned in the body – 600 in extremities, 230 in trunk and 70 in head-neck. These *Snayu* are of 4 types according to their size and shape – *Pratanvatt* (broad), *Vritta* (round), *Prithu* (thick and big), *Sushir* (hollow).

(iv) **Mamsarajju (Muscular fascia)** – They are 4 in number situated on either side of back, 2 lying externally and 2 internally. Their main function is to bind up all the muscles of back.

(v) **Kurcha (Brush like structures)** -These are 6 in number, 2 in hands, 2 in feet, one each in neck and penis.

(vi) **Seevani (Raphe)** – Total 7 sutures are mentioned – 5 in head-forehead, 1 in *Shephas* (scrotum,below the root of penis), 1 in dorsal surface of tongue.

(vii) **Jala (Networks)** – They are 4 in number, one each of *Mamsa*, *Sira*, *Snayu* and *Asthi*.

(viii) **Asthi (Bone)** - *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 total 300 bones in the body – 120 in extremities, 117 in the *Shroni* (pelvis), *Parshava* (flanks), *Prishth* (back) and *Uras* (chest), 63 in head-neck. He has even elaborated the number and place of these bones.

(ix) **Sandhi (Joints)** – Joints have been classified into 2 – *Chala sandhi* (movable) and *Achala sandhi* (fixed). Again these are classified into 8 types- *Kore sandhi* (hinge joint), *Ullukhala sandhi* (ball and socket joint), *Samudga sandhi* (concave joint), *Pratar sandhi* (pivot and gliding joint), *Tunna sevini* (suture), *Vayas tunda* (crow beak joint), *Mandal* (Annular joint), *Shankhavart sandhi*. There are total 210 joints in the body – 68 in *Shakha* (extremities), 59 in *Koshtha*(trunk), 83 in head-neck.

4. Yantra (Blunt Instruments) and Shastra (Sharp Instruments)

Surgery can't be thought of without use of instruments. Surgical instruments are the means of extracting the *Shalya* (any foreign body or extraneous substance which troubles the body and mind) from its seat or place where it is embedded. *Sushruta* has given 101 *Yantra* (used as associates of *Shastra*) divided into 6 types- 24 *Svastika yantra* (cruciform instruments), 2

Samdamsha yantra (pincers, forceps etc), 2 *Tala yantra* (instruments with flat disc), 20 *Nadi yantra* (tubular instruments), 28 *Shalaka yantra* (rod like instruments) and 25 *Upayantras* (accessory instruments). Names of these are given as per their shapes resembling to the animals, birds etc. e.g., *Simhamukha* (Lion Forceps), *Shararimukha* (like Sharari bird - Scissor). His *Samdamsa Yantras* are the first forms of the modern surgeon's spring forceps, dissection and dressing forceps. Diagnostic instruments like *Nadiyantra* and their principles were first laid down by *Sushruta*, which took several modifications with advent of technology to attain present form of endoscopes.^[29]

Apart from these *Yantra*, 20 *Shashtra* have been mentioned which are employed in *Shashtra karma* (main operative procedure) – *Mandalagra shastra* (round knife, sharp curette), *Karpatra* (surgical saw), *Vridhipatra* (bistuar), *Nakha* (nail), *Mudrika* (finger knife), *Utpalapatra* (lancet), *Ardhadhara* (curved lancet), *Suchi* (surgical needles) *Kushpatra* (long double edged scalpel), *Aatimukha* (short scissors), *Shararimukha* (long scissors), *Antarmukha* (curved lancet), *Trikurchaka* (brush like sharp spike in three sides), *Kutharika* (surgical axe), *Vrihimukha* (trochar), *Ara* (awl), *Vetasptra* (scalpel), *Badisha* (sharp hooks), *Dantashanku* (teeth scraper), *Eshani* (sharp probe). For an accomplished surgeon it is essential to gather and keep the necessary equipments ready and *Sushruta* has dealt with various instruments, their uses, *Guna* (properties), *Dosha* (defects), maintenance of their sharpness and its preservation etc. very well.^[30]

The shapes of *Yantra* and *Shashtra* are further modified to compete with the surgery in modern era but the basic concept and their functions remain the same.

5. Sterilisation & Antiseptic measures

The instruments advocated for surgical procedures should be heated prior to their use otherwise there is danger of pus formation.^[31] The surgeon should cut short his hair, nails and should wear white sterilized clothes.^[32]

6. Sangyahaarana (Anaesthesia)

Sushruta says wine should be used before operation to produce insensibility to pain those having habit of drink wine. He again remarks, it is desirable that the patient should be fed before being operated on those are non-addicted to wine. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient who

has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation.^[33]

7. Trividha Karma (Three Operative procedures)

The *trividha karma* are nothing but the pre-operative, operative and post-operative procedures, a systematic portrayal of surgery. Whichever the surgical procedure may be it has the above said three parts in it.

(a) Purvakarma (Pre Operative)^[34]

Pre-operative means not only related to preparation of patient. *Sushruta* stresses the importance of collecting all the materials needed during the operative procedure and for postoperative care. He has given a list of appliances required in surgical operations e.g. Blunt Instruments, Sharp Instruments, Leeches, Cotton, Pieces of Cloth, Thread, Leaves, Materials of Bandaging, Honey, Ghee or Clarified Butter, Suet, Milk, Oils, Decoctions, Cold and Hot Water, Iron Pans and other Earthen Vessels; Beddings and Seats, Obedient, Steady and Strong Servants etc.

(b) Pradhana Karma (Main Operative procedure)

This includes mainly *Ashtavidha Shastra karma* (*Chedana, Bhedana, Lekhana, Vyadhana, Eshana, Aharana, Visravana, Seevan*).¹⁰ Almost all surgeries performed today by modern surgeon include these eight techniques of *Sushruta*. He has given *Seevan karma* in detail with types of sutures, materials used, type of suturing, how to apply suture etc.

***Seevan Karma* (Suturing)^[35]**

The threads used may be of silk, cotton, jute, human hair, horse hair, *Snayu* (tendon), inner bark of tree, tendril etc. The needles may be of straight, round body, straight triangular, curved, half curved, curved triangular etc. The types of suturing are: *Rujugranthi* (simple interrupted), *Anuvellita* (simple continuous), *Gophanika* (blanket sutures), *Tunna sevani* (lambart, subcuticular) etc. In surgery how skin suturing should be done to avoid the complication is most important. It Should not be too long from margin otherwise may be painful and should not be too close from margins otherwise they will cut through.

(c) Paschat Karma (Post Operative measures)^[36]

After the operative procedure, the patient is to be assured. The operative wound is to be cleaned & dressed with *Vikeshika* (medicine impregnated pad) or proper medicated oil,

emulsion, paste or dusting powder etc. The operative wound portion is to be fumigated with germicidal and air purifier medicines to avoid the pus formation. *Raksha karma* (protective rites) for patient has been given. The patient is to be kept in *Vranitagara* (post operative ward) for ten days as mentioned below. Here *Sushruta* has given do's and don'ts for the patient, dietary instructions, proper wound management and medication.

8. *Vranitagar* (Surgical ward)^[37]

Sushruta directs that there should be a particular room provided for patients who have undergone surgical operation. This room should be a clean house, situated in a wholesome locality, free from dirt-sunlight and heavy breeze. The bed of the patients should be soft, spacious, and well-arranged with head towards east and weapons alongside (for protection from enemies, animals etc.). Room should have some affectionate friends/attendants of patient with him. The fumigation of the sickroom with antiseptic preparations such as *Ashtanga dhupas* should be done.

9. *Vrana* (Wound)

Vrana is a very important part of our surgical practise and *Sushruta* has described it in detail alongwith detailed description of its management in his *Samhita*. He has mentioned two types of wounds i.e. *Nija* and *Aagantuja* (accidental injuries) which have their own subtypes and the phases through which a wound goes during its healing. These wounds if neglected become *Dushta vrana* (contaminated wound) and fail to heal, so to prevent contamination and provide quick wound healing surgeon should understand the nature of *Vrana* and act accordingly. He has dedicated three chapters of *Sutrasthana* (chapter 21 to 23) for this purpose. *Sushruta* has beautifully explained each aspect of *Vrana*, and its management in two chapters (1-2) of *Chikitsa sthana* elaborately.

10. *Bandhana* (Bandaging)^[38]

A detailed account of utilization of bandages in post operative care of the wound and in fracture management is noteworthy. After *Pradhana karma*, the area has to be bandaged with or without medicated dressing. It protects the *Vrana* from flies, dust, cold, wind etc and thus prevent it from becoming infected. *Sushruta* has given 14 types of bandaging. He explained different materials that can be used for *Bandhana*, how to bandage, How much pressure it should exert, when to change the bandage and which type of *Vrana* not to be bandaged. This knowledge is essential for post operative care of *Vrana* and its proper healing.

11. *Shalya* (Foreign bodies)

At that time the commonest weapon used in wars were arrow, spear, sword etc which used to pierce the body and act as foreign material leading to suffering to the patient. Besides these, stones, seeds, food etc get lodged into orifices like ear, throat and lead to trouble. *Shalya* means the disease process which brings pain and discomfort in *Sharira* (body) and *Mana* (mind) of the patient, *Sushruta* has given two types of *Shalya* - *Sharirik* and *Aagantuj shalya* (some of which suppurate if left and some get dissolved/absorbed in body), features of *Shalya* in different *dhatu*s, methods to diagnose these and their management (15 *Shalya nirharan upaya* – removal of foreign bodies).^[39] Features of drowning and its management is also mentioned.^[40]

12. *Agni karma* (Thermal cauterization)^[41]

Properly carried out *Agni karma* obviates the recurrence of disease and conditions resistant to medication, *Kshara* and *Shastra karma* are curable by *Agni karma*. Its indications, contraindications, types, shape of *Dagdha*, features according to site, materials used etc has been described by *Sushruta* in detail.

13. *Kshara karma* (Chemical/Alkaline cauterization)^[42]

It is the most important measure amongst *Shastra* and *Anushastra*; it performs excision, incision etc., arrests three *Dosha* (causative factors). It is of two types - *Paniya* (internal use) and *Pratisarniya* (external use) and is manufactured in three strengths – *Mridu* (mild), *Madhyam* (moderate) and *Teekshana* (severe). Its preparation, *Guna* (properties), *Dosha* (defective factors), indication, contraindication, technique of utilization, features of proper *Kshar karma* has been explained in detail.

14. *Raktamokshana* (Blood letting)

It is very important as it is considered to occupy 50% of entire surgical management. Bloodletting being practiced in world is the contribution of great *Sushruta*. Two separate chapters (*Jalaukavacharan* and *Siravedha*) are devoted for the bloodletting in patients with detailed description of whole procedure, indications, complications, their management etc.^[43,44] Now a day's plastic surgeons are using *Jalauka* (leech) for proper acceptance of graft. In case of post trauma hematomas and in ischemic cases leech application has been reported very useful.^[45,46]

Rakta Sandhana (Haemostasis)^[47]

Sushruta has given four steps to control excessive bleeding occurring after *Siravedhan* (puncturing of vein) – *Sandhana* (joining the edges of the wound by use of astringent drugs), *Skandhan* (promoting clotting by use of cold), *Pachana* (styptics by use of ash, alkali etc.) and *Dahana* (cauterisation).

Kashaya (Astringents) unites the wound edges, *himm* (cold) makes the blood clot, *bhasma* (ash) adheres there and closes the wound and *daah* (thermal cauterization) constricts the vessel thereby stopping the bleeding.

15. *Shotha (Inflammation)*^[48]

It is a localized swelling characterized by an augmented size, even or uneven elevation, situated in skin and underlying tissues, having accumulation of *Dosha* (causative factor), arising in any part of the body and different from *Granthi* (cyst/lipoma), *Vidradhi* (abscess) and *Alji* (cervical lymphadenitis). It is of 6 types depending on *Dosha* (*Vataja*, *Pittaja*, *Shleshmaja*, *Sannipataja*, *Shonitaja*) and *Agantuja* (external factor) and has 3 stages – *Aam*, *Pachyaman* and *Pakva shotha*. *Sushruta* even gave its pathogenesis- without *Vata* there is no *Ruja* (pain), without *Pitta* there is no *Paka* (ripening), without *Kapha* there is no *Puya* (pus); hence during the stage of ripening of *Shotha* all *doshas* are involved. Vitiating *Pitta*, takes control of *Vata-Kapha* and causes ripening of *Rakta*, this is the second opinion. *Sushruta* has given the 7 principles of its management – *Vimlapana* (softening by kneading with fingers), *Avsechana* (blood letting), *Upnaha* (warm poultice), *Patana* (incision), *Shodhana* (cleaning), *Ropana* (healing) and *Vakritapahama* (removing the abnormalities). He even mentioned complications of inadvertent incision in *Aam* and *Pakva vrana shotha*.

Vidradhi (Abscess)^[49]

The abscess which is ripe and bulged should be cut open. The knife should be inserted in the direction of hairs avoiding vital spots, vein, ligaments, joints, bones, arteries and go deep till the pus is seen, then knife is taken out at once and quickly. In broad swellings another incision may be given at a distance of 2 or 3 *Angula* (finger breadth) in between. After determining the route (channel of pus) and places of bulging (most prominent part), incision may be given so that vitiated material (pus etc) do not remain inside. After giving incision entire area is kneaded by fingers and massaged mildly to remove all the pus. This is the beautiful description of incision and drainage, counter incisions in case of an abscess proving the proverb “where there is pus let it out” to be correct.

16. *Dagdha Vrana* (Burns)^[50]

Acharya *Sushruta* has described burns caused by hot liquid or solid. These are of 4 types – *Plushta* (1st degree burn), *Durdagdha* (2nd degree burn), *Samyak dagdha* (3rd degree burn), *Atidagdha* (4th degree burn). Later he gave more varieties of burns depending on source – *Dhoomophata* (inhalation injury), *Atapa dagdha* (heat stroke), *Ushna vata dagdh* (sun stroke), *Sheet varshanil dagdh* (cold injury), *Indravajra dagdh* (burn due to lightening). The pathogenesis of burns is also mentioned – *Agni* (fire) causes vitiation of *Rakta*, there is aggravation of *Pitta* also at same speed. Both possess same *Veerya*, *Rasa* and *Dravya* so *Pitta* undergoes *Vidaha* and lead to severe burning sensation, formation of blebs, thirst and fever. The management of each variety is given separately and also indicated resistance of bandaging in burn injuries.

17. Ophthalmic Surgery

Among seventy six ophthalmic diseases, fifty one are surgical. The mode of operation which is to be performed in each case has been elaborately described. He has mentioned *Chedana* (excision) for *Vartamaarsha* (form of trachoma), *Shuskarsha* (polyp of palpebral conjunctiva), *Vartam arbud* (lid tumor), *Siraja pidika* (episcleritis, scleritis), *Arma* (pterygium) and *Parvanika* (phlyctenular conjunctivitis); *Lekhana* (scrapping) for *Utsangi* (chalazion cyst in lower lid), *Bahal vartam* (multiple chalazion cyst), *Kardamvartam* (mucopurulent conjunctivitis), *Syava vartam* (inflammatory condition of eyelid), *Baddha vartam* (angio-neurotic edema), *Klishta vartam* (allergic conjunctivitis), *Pothaki* (Trachoma), *Kumbhika vartam* (meibomian cyst) and *Vartamsharkara* (lithiasis conjunctiva); *Bhedana* (incision) in *Shleshma Upnaha* (lacrimal cyst), *Lagana* (chalazion cyst), *Krimi granthi* (Blepharitis), *Bias vartam* (xanthelasma) and *Anjanamika* (External hordeolum); *Vedhana* (puncturing) in *Sirotpata* (allergic conjunctivitis), *Siraharsha* (acute orbital cellulitis), *Anyatovata* (referred pain in eye, sphenoidal sinusitis), *Puya alasa* (Acute Dacryocystitis), *Adhimanth* (glaucoma) and *Abhishyanda* (conjunctivitis).^[51] *Sushruta* has mentioned the procedures for each disease independently in concerned chapters. Some examples are as below.

(i) *Lekhana karma* (Scrapping)^[52]

Eye is washed, fomented, eyelid is held by folds of cloth, held by thumb and fingers of left hand; lid is raised up, everted and the area marked out by a sharp instrument is scrapped with sharp instrument or rough leaf. After the bleeding has stopped, lid is fomented again, smeared

with medicated paste, washed with warm water and treated like a wound. He has even given the complications arising due to improper or excess *lekhana*.

(ii) *Shashtra karma* (Surgery) for *Arma* (Pterygium) ^[53]

Eyes are enraged by putting *Sandhava lavana* (salt) into them. Then fomentation is given to eyes, patient is asked to look at *Apanga* (outer canthus), *Arma* is held by physician at the place where it has wrinkles, catching it with *Badish yantra* (hook forcep) or *Muchundi yantra* (toothed forcep) and lift it up then it is cut with *Mandalagra shastra* (curved lancet), the cut end is released from its attachments on all sides, then brought near *Kaninaka* (inner canthus) and cut. He told to leave 1/4th portion of *Arma* as this prevents complications. Injury to inner canthus leads to bleeding or formation of sinus and inadequate cutting results in regrowth of *Arma*.

(iii) *Shashtra karma* in *Pakshamakopa* (Inflammation of area of eye lids) ^[54]

Lift the skin of lid near the area of eye lashes, cut it in *Yava* (barley grain) shape with sharp instrument at a place equidistant from *Kaninaka* (inner canthus) and *Apanga* (outer canthus), remove and discard the skin and then suture the wound.

(iv) *Shashtra karma* in *Kaphaja lingnash* (cataract) ^[55]

Sushruta is attributed the glory of discovering the art of cataract-crouching. Select a place near *Apanga* (outer canthus) avoiding 2/3 portion of *Shukla* (sclera) from *Krishna* (cornea) devoid of network of veins, the incision is taken not below, not above, not laterally i.e. exactly at *Daivyakrita cchidra* (limbal region) with a rod like instrument having cutting edges in shape of *Yava* (barley) which is today's cataract crouching. When incision is done properly a drop of water comes out accompanied with sound, this indicates the transparent lens and its expulsion causing small sound while coming out through the small incision. In particular, *Sushruta* describes what may have been the first extracapsular cataract surgery using a sharply pointed instrument with a handle fashioned into a trough.

18. Anorectal disorders

Sushruta has described elaborately *Arsha* (haemorrhoids) and *Bhagandara* (fistula-in-ano), their definition, causes, classification, clinical features, treatment etc. In addition, he has also mentioned about *Charmakeel* (anogenital warts), *Sanirudha guda* (anal stricture), *Guda bhramsa* (rectal prolapsed), *Parikartika* (fissure-in-ano) etc.

(i) In *Arsha* (haemorrhoids) with non chronic, mild vitiated *dosha*-symptoms-complications treatment is done by medicine; soft, broad, deep and bulged piles are treated with *Kshara* (chemical cauterization); *Agni karma* (thermal cauterization) is done in rough, immovable, big and hard piles; *Shastra-karma* i.e excision of piles was described by *Sushruta* in pedunculated, bulged & exuding (bleeding) piles.^[56] That means haemorrhoidectomy was performed in ancient time.

(ii) In *Bhangadar* (fistula - in- Ano) after probing in fistula tract it should be elevated & total tract is removed i.e. fistulectomy was practiced during *Sushruta*'s time. He even mentioned different incisions for this purpose e.g. *Sarvatobhadrak* (circular incision), *Gotheerthaka* (semi circular) *langalaka* (plough shaped), etc. *Sushruta* also mentioned management of these by medication, *Agni karma*, *Kshara karma*, *Raktamokshan*^[57] and *Kshara sutra* (medicated Alkali thread) application.^[58] The track is probed with *eshani* (probe) then needle with *Kshara sutra* (medicated Alkali thread) is introduced till the end of the track is reached, the needle is then lifted up, end of the thread is pulled out and knot is tied. The *Kshara sutra* is changed again and again till the track gets cut.^[58]

(iii) For *Sanirudha guda*, gradual dilatation has been advised.^[59]

(iv) For *Guda bhramsa* digital repositioning has been mentioned.^[59]

19. *Ashamri* (Urinary calculus)^[60]

Sushruta has given special attention towards *Ashmari* particularly in urinary bladder and has given details of its etiology, pathogenesis, classification, signs and symptoms, complications which resemble today's description. While describing the disease he said that it is difficult to cure and mentioned its treatment in detail alongwith its surgical management. The patient is laid flat with upper part of his body resting on the lap of another person sitting on a knee-high plank facing east; the patients' waist should be raised by cushions and his knees and ankles flexed and tied together by straps. After massaging the left side of the well oiled umbilical region pressure should be applied first below the navel until the stone comes down. Introduce the lubricated index and middle fingers of left hand into the anus along the perineal raphe. Thereafter, with manipulation and force bring the stone down between the anus and penis. Keeping the bladder tense and distended so as to obliterate the folds, the stone is pressed hard by fingers so that it becomes prominent like a tumour. On the left side of raphe leaving a space of a *Yava* (barley grain), an incision of about the size of the stone is made and stone is

removed with *Agravakra* instrument. Some say that the incision is given on the right side for the sake of technical convenience. Precautions should be taken so that the stone does not get broken or crushed. Even a small particle left behind can increase in size. *Sushruta* even gave the complications of this surgery alongwith postoperative diet and wound management in which he mentioned *Uttarvasti* (urethral enema) for removal of clotted blood in bladder resembling bladder wash given in today's practise.

20. Swellings

All kind of swellings, generalized or localised; *Shotha* (edema), *Granthi* (cyst/lipoma), *Arbuda* (tumour), *Gulma* (abdominal Swelling/tumors), *Udavarta* (abdominal distension due to flatulence) etc. find a place in *Sushruta's* work along with aetiology, symptoms, prognosis and management – medical or surgical whatever needed. Some of their surgical management is as follows.

(a) ***Dakodara (Ascitis)***^[61] - *Vedhan karma* i.e. tapping is performed. *Vedhan* is done below & left lateral to umbilicus (4 *Angula* from line of hair) with the help of *Vrihimukha shastra* (trocher) to the depth of thickness of the centre of thumb and a *Nadi* (cannula) is fixed to the trocher for removing fluid and abdomen is bandaged tight after that. All fluid should not be drained in one day itself as it will lead to complications was mentioned clearly by *Sushruta*.

(b) ***Baddha-gudodar (Intestinal obstruction)***^[61]. Incision is made at four *Angula* (finger breadth) apart from midline on left side below the umbilicus (left paramedian), the intestine is pulled out through the wound and examined, obstruction is removed & intestine is returned back to abdomen after anointing it with *Madhu* (honey) and *Ghrita*. Then *Udar sivan* (abdomen closer) is done.

(c) ***Chhidrodar (Intestinal perforation)***^[61] – *Shalya* is removed as above, cut ends of the intestines are brought closer and got bitten by *Pipilika* (big black ants) in the perforated part of intestine, the body of these ants is cut and removed leaving behind their heads only after they have stuck up well which resemble today's advanced method for intestinal suturing and the abdomen is closed. He even mentioned that the patient is kept on *Dugdha ahara* (Milk diet) after surgery and in *Taila* or *Ghrita droni* (bath tub)so as to provide him complete bed rest and rest to intestines till they heal.

(d) **Arbuda (Tumour)** - According to *Sushruta*, Arbuda are gradually increasing, big, globular, slightly painful, fixed, deep-seated, fleshy masses that usually do not suppurate. They can arise from any part of the body surface. They are caused by derangement of *Mamsa* and *Rakta dhatu* vitiated by *Tridosha*. Several references are available regarding local and distal spread of the tumour (*Dwirarbuda*) as well as its recurrence (*Adhyarbuda*).^[62] While describing the treatment of tumours, *Sushruta* has explained beautiful how to use *Kshara sutra* in an *Arbuda*. After lifting *Arbuda* from its base *Kshara sutra* Is tied around its base and tied, the thread may be passed through a needle having a hole in front and inserted at the base of tumour and tied, after the tumor is cut off, it is treated as a wound.^[58] He mentioned that all efforts should be made for the complete removal of *Arbuda*, as incomplete removal causes recurrence and ultimately destroys the person.^[63]

21. **Bhagna (Fractures and Dislocations)**

The major part of surgery was indeed concerned with trauma and its management. Fall, compression, blow, sudden muscle contraction/throw, animal bite etc. lead to *Asthi bhagna* which is of two types – *Kanda bhagna* (fractures, 12 subtypes) and *Sandhimukta* (dislocation, 6 subtypes). The twelve types of *Kanda bhagna* include a wide range from greenstick and hairline to compound and communitated fractures. Signs, symptoms of each and prognosis have been mentioned.^[64]

Detailed management of these has been given with 4 basic principles – *Aanchan* (traction), *Peedan* (manipulation), *Sankshepa* (optimum position for fixation) and *Bandhan* (immobilization by splints and bandaging) which is nowhere less than the contemporary orthopaedic practice. He has even described the management of each bone fracture and dislocation separately. In compound fractures local treatment of wound is specified and many formulations cleansing are recommended for the promotion of healing.^[65] *Bhagna ropana* (healing of fracture) is considered good if there is no swelling, no shortening, no elevation (bony prominence) and capable of all activities comfortably.^[65]

Sushruta has covered almost entire range of different types of fractures and dislocations. Alongwith basic principles of management he has also given dietary instructions, time required for healing, type of bandaging, need to avoid sepsis, osteomyelitis, pathological fractures, management of mal union (breaking and resetting it), physiotherapy, factors that delay healing and above all the features of good healing.

22. *Sandhana karma* (Plastic surgery)^[66]

In old days one of the royal punishment was to cut away the ear lobules, nose etc. Indian surgeons have applied their techniques for correcting such deformities by shifting the skin flap to reform the nose, ear and lips, whose detailed description is given by *Sushruta*. He explained Rhinoplasty, classification of mutilated ear lobe defects and techniques for repair of torn ear lobes (15 different types of otoplasties), cheek flap for reconstruction of absent ear lobe, repair of accidental lip injuries and congenital cleft lip. He also gave enough importance for adequate blood supply as well as perfect haemostasis in graft bed suggesting *Sushruta* to be the originator of plastic surgery.

(i) **Method of Otoplasty**^[66] – *Sushruta* advised to perform reconstructive surgery of ear lobules in various defects caused by trauma or congenital reasons. He gave 15 techniques for repairing *Karna* (ear). Appropriate technique is decided i.e. excision, scrapping, puncturing etc., blood of ear is then examined for vitiation or non vitiation of *Dosha* and ear is washed accordingly. Incision is made and Affected parts are joined together, neither too high nor too low and not irregular and then sutured after the bleeding stops.

(ii) **Method of Rhinoplasty and Oroplasty**^[66] – A leaf of tree should be taken and cut to the shape of nose, this is placed on the cheek and cheek muscle is cut to same size; raising a flap of it and maintaining the connection with live muscles. Flap is placed quickly on mutilated nose after scrapping it then suitable bandage is tied inserting 2 tubes into the nose. After union has healed, the flap is cut at its half length allowing the remainder intact. Similar procedure is followed for oroplasty except insertion of the tubes.

Rhinoplasty was one of the great highlight of *Sushruta's* surgery. The construction of a new nose brought him fame as the originator of plastic surgery. The famous Indian Rhinoplasty (reproduced in the October 1794 issue of the Gentleman's Magazine of London) is a modification of Rhinoplasty described by *Sushruta*. Even today pedicled forehead flap is referred to as the Indian flap.^[67]

23. *Koshthabheda* (Abdominal injuries)

Sushruta gave description of abdominal injuries also. He Stated its features and management.

(i) When *Medovarti* (omentum) comes out of abdomen, it should be smeared with astringent drugs, ash or mud, tied with thread, cut using heated sharp instrument and placed back.^[68]

(ii) ***Koshtha shalya aharana (Removal of foreign bodies from abdomen)*** - The foreign body lodged inside should be removed by incising the abdomen.^[68]

(iii) ***Raktapurna koshtha (Internal haemorrhage)*** - If haemorrhage is in *Amashaya* (Stomach), then emesis is beneficial, if in *Pukvashaya* (Intestines) purgation should be administered and decoction enema should be given. If the bleeding is severe or the organs are punctured then patient may drink blood of animals (kind of blood replacement used at that time).^[68]

(iv) ***Nishkranta antra (Protruded intestine)*** - When punctured intestine has protruded out of the abdomen it should be placed back through the same orifice or it should be washed to remove blood sand etc and held tight by heads of big ants and then pushed back slowly. If intestinal mass is big and the wound is small then the surgeon should incise the abdomen (extend the wound) to required length, place the intestine back and suture the wound without laxity, the intestine improperly placed or twisted takes the life of patient (torsion of intestine).^[68]

(24) ***Stri and Prasuti rog (Gynaecology and Obstetrics)***

Sushruta was the first to mention caesarean section done frequently these days. He also mentioned surgical management of intrauterine deaths.

(i) ***Mudhagarbha (Intrauterine death)*** - To save the mother, *Sushruta* advised to remove dead part of foetus which can be correlate with removal of dead foetus i.e. craniotomy. The head of foetus should be punctured with *Mandalagra* (round knife, sharp curette) or *Anguli* (finger knife) *shastra*, skull is squeezed held with a hook and pulled out either by chest or axilla, if puncturing the head is not possible then the eye socket or cheek may be punctured and pulled out, if shoulders are obstructing then arm may be cut at shoulders and foetus pulled out, if abdomen is bloated, the abdomen should be cut open intestines are made loose and the foetus is pulled out, if obstructed by hips then the flat bones of hip should be cut and the foetus is removed. That means whichever part is obstructing, it should be cut and foetus is pulled out to save the mother.^[70]

(ii) **Caesarean Section.** -When the woman is dead but there is throbbing movements in abdomen then the physician should immediately cut and open the abdomen of woman and save the child. This resembles caesarean section performed today.^[70]

23. Miscellaneous

(a) **Antravriddhi (Inguinal hernia)** – It has been explained clearly how a hernia is formed by *Acharya* and in its management *Agni karma* and *Siravedha* has been mentioned. And has considered *Kosh prapta antravridhi* (hernia descending to scrotum) to be *Asadhya* (incurable).^[71]

(b) **Mutravriddhi (Hydrocele)** - *Vedhan karma* i.e. tapping of fluid collected in tunica vaginalis layer is advised in *Mutravridhi*. The site of tapping is lateral side of *Sevani* (raphe) of scrotum to avoid injury to testis & then remove the fluid with the help of *Vrihimukh nadiyantra* (trochar).^[71]

(c) **Medaj vridhi (Sebaceous cyst of Scrotum)** – Swelling is wrapped with cloth bands, incised using *Vridhipatra* (sharp instrument - bistuary) protecting the *Phala* (testis) and *Sevani* (raphe); fat removed by scrapping.^[71]

(d) **Nirudhaprakash (Phimosis)** – *Nadi yantra* (A tube with opening at both ends) made from either wood or iron, smeared with ghee are introduced into urethra, thicker tube is inserted after every 3 days thereby widening the urethral passage. If it fails then *Shastra karma* is done in which *Sevani* (raphe) is cut open and treated like a wound. It resembles dorsal slit in today's practice.^[72]

(e) **Parivartika (Paraphimosis)** – *Sushruta* has given manual replacement of foreskin slowly after lubricating it with *Ghrita* (ghee). Prepuce is slowly pulled forward and *Mani* (glans penis) is pushed in, after *Mani* has gone into the prepuce warm poultice is tied for 3-5 days.^[72]

(f) **Kadar (Corn)** – It should be removed out by sharp instrument (excision), then the site is burnt with hot oil.^[72]

(g) **Chippa (Whitlow) and Kunakh (Paronychia)** – The bad muscles are excised and pus etc drained out and treated as wound.^[72]

(h) **Shira shalya (Foreign body in skull)** - After removing foreign body from skull, wicks made of hair are inserted into the wound otherwise *Mastulunga* (brain matter) may flow out of the wound and may kill the patient.^[73]

CONCLUSION

Sushruta Samhita is a beautiful composition of *Acharya Sushruta* with sequential arrangement and detailed description of the topics in form of verses. The influential nature of the *Sushruta Samhita* is supported by anatomical knowledge and description of surgical procedures in it and by the creative approaches that are held true till today. *Acharya Sushruta* has covered every branch of medical science but has given more emphasis on surgery. He 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. Instead of research work done till date, there are many hidden facts in the text which can be further explored. Because of his deep rooted knowledge and wonderful contribution towards the field of surgery, he is respectfully known as "Father of Indian surgery" and "Father of Plastic surgery". We are proud to have such a genius as the pioneer of our surgical heritage.

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