

**SUSHRUTHA THE BASE OF SURGICAL SCIENCES WITH SPECIAL
REFERENCE TO YOGYASOOTRIYA**

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ABSTRACT:

Shalya tantra is an ancient surgical science that embraces all the processes that aims at the removal of factors responsible for producing pain or misery to the body and the mind.¹ In his treaties, father of modern surgery *Acharya Sushruta* has described a wide range of explanations, covering almost all aspect of medical sciences ranging from embryology to structural anatomy. *Acharya* has not only explained about diseases and treatment but also has explained from the basics of anatomy to the pathogenesis of the diseases, how to get trained to treat these conditions and also techniques to combat any complications.

He has given equal importance to medicines as well as surgical techniques and has also explained the indications of the surgical procedures. The ethical aspect to be kept in mind is also elucidated. Present article emphasizes on the ancient and present concept of surgical sciences, its teaching and training modalities, thus trying to prove that *Acharya Sushruta* is the base of surgical sciences.

KEY WORDS: *Sushruta, Ayurveda, Yogyasootriya, surgical training.*

INTRODUCTION

Acharya Sushruta has been regarded as one of the pioneers of surgery. He performed procedures with crude surgical instruments which are the base models for the current surgical instruments. His work is assembled into

a monumental thesis, possibly the first text book on surgery, the '*Sushruta Samhita*' where he describes surgical instruments, procedures, illnesses, medicinal plants and preparation, dissection and the study of human anatomy, embryology and fractures.²

He also have clearly mentioned about the methodology of theoretical and practical studies, admission criteria for the disciples and also the code and conducts to be followed by the students. *Sushruta samhitha* provides minute details of pre-operative and post-operative care, diet, techniques, indications and contraindications. Even though considered as father of surgery, he believed that knowledge of both the medicine and surgery are essential to constitute a good doctor, who otherwise is like "a bird with only one wing".³

SISHYOPANAYANEEYA:

The study of *Ayurveda* should be offered to young boys of *Brāhmana*, *Kshatriya* and *Vaiśya* hailing from a sound pedigree. The pupil must be young, strong and courageous with having a good conduct and having a respect for tradition, keeping a clean mind and soul as well as good memory. He should have a clear understanding of the subjects proper. Physical outlook the candidate possess are - thin lips and tongue, straight teeth and face with attractive good eyes and nose. He should have a cheerful mind and should have dignity in speech and movements.

Anyone lacking in these qualities should be rejected for the training.⁴ The surgical training should take place in the auspicious moment blessed by the appropriate planetary predominance and in auspicious location. On clean and even ground, a quadrangular platform of four square should be prepared and plastered with cow dung and covered over with *darbhā* grass. Worship with flowers, gems, parched paddy and cooked rice should then be offered to gods, *brahmana's* and physicians. *Brahmā* figure should be installed on the right side and a fire should be lit nearby *brahma*. Wood of *khadira*, *palāśa*, *devadāru* and *vilva* or of four *kshīri vriksha's* soaked in curd, honey and ghee should be used to light the fire. There upon *Dārvihoma* should be conducted as per rules with the chanting of *Om'*, and '*Svāha* incanted after the offering of oblations of ghee to the gods and sages. The pupil should repeat the chant after the *guru*.⁵ The student should go around the platform thrice witnessing the fire. Having cleansed the mind of lust, anger, greed, delusion conceit, jealousy, harshness, ill will, falsehood, laziness and infamous conduct the student shall attend to the

cleanliness of the body by regular cutting of nails and hair as well as wearing ochre-colored clothes. You shall adhere to the of truth, austerities, abstinence and reverence to learning. In standing, sitting, moving about, sleeping, chanting and studying you shall comply with the *guru's* instructions and do whatever is told by the *gurus*.⁶ Misconduct shall result in fruitless learning with no chance for attaining excellence. The student should offer medicines and treatment to *brāhmanas*, elders, the poor, friends, wandering sages, good men, orphans and the newly-arrived from far away just as you would treat your relatives. This is good and noble conduct. Bird-catchers, the deprived and the sinners must be refrained from treatment. By following these codes of conduct the students' knowledge will be enhanced and will gain friends, high repute, virtue, affluence and worldly comforts. Study should be suspended on the eighth day (*astami*) of the fortnight and also the last days of both fortnights. Avoid studying in dawn and dusk every day, during unseasonal lightning and thunder and periods of instability in dark kingdom and at home. It is

inappropriate to perform studies the cremation ground, battlefield, places of execution, during festivals and the occurrence of unnatural events.⁷

THEORY AND PRACTICE:

A *Sishya* must study all the *Ashta ayurveda* during the period of study and practical training. Physician well versed in theory and practice will qualify to be a royal physician. A man trained in theory but not in practice would be confused in distress like a coward in the battlefield. The student ignorant of theory would fail to win the confidence of people and may even get capital punishment from the king. Both these types of people have half knowledge and are totally disabled like a one-winged bird. In the hands of the ignorant physician, even nectar becomes poison. The ignorant physician must be avoided at all costs because he is considered as a quack who kills people out of greed and negligence. On the other hand, a physician well-trained in theory and practice achieves his therapeutic goals even as a two-wheeled chariot performs triumphantly in the battlefield.⁸

METHODOLOGY OF STUDY:

After purifying oneself, the student should wear an upper garment should approach the guru with a studious mind. Depending on the learner's ability to learn, the guru will teach him words, a quarter verse or a whole verse. Every student should be involved in the study process and the student should take care not to read either too fast or too slow. The student should read without hesitation and without nasal tone. The sentences should not be shortened and should be pronounced clearly. He should not make gestures with the face or hand. No one should be permitted to pass between him and the pupils during study.⁹ Living a clean and pure life near the teacher, enhancing skills and knowledge by constant effort, alert and free from too much sleep, a student becomes an expert in the science of *Ayurveda*.¹⁰ At the conclusion of the study, he should aim to expertise the spoken word and enhance practical knowledge, professional proficiency, and the ability to achieve the results of action.¹¹

IMPORTANCE OF UNDERSTANDING IN STUDIES:

A person who memorizes or who reads a text without understanding its

meaning is like an ass with a load of sandalwood on its back which bears the burden without enjoying the fragrance.¹² Thus, the study is done in several fragments as *Ayurveda* is very vast and complex. The study of vital spots (*marma*), blood vessels, ligaments, joints, bones are complex. The procedures such as the extraction of foreign bodies, and treatment of fractures are complex. These concepts are enough to confuse even a great intellect. It is therefore essential that a pupil listens to every word, every quarter verse, every verse which *guru* interprets.¹³ The treaties stated in this text does contains ideas and interpretations from other *Samhita's* too. And those who wish to study them should consult appropriate authorities. It is highly impossible to compress the wide range of concepts and interpretations of *āyurveda* into a single text.¹⁴ A good physician does not confine himself to a single discipline or text but seeks to expand his knowledge by exploring several disciplines.¹⁵ When he has learnt the science of medicine directly from a *guru* and puts whatever he has learnt into extensive practice his work excels. Others who claim to

practice medicine are no better than cheats and thieves because they rob patients under false promises.¹⁶

AN AUTHORITY PRACTITIONER:

A physician becomes eligible for a royal license to practice medicine when he completes the study of texts on his own and from his *gurus* directly and also when he has attended demonstrations of procedures and performed them by himself. A practicing surgeon should observe through cleanliness and keep his nails and hair short, wear simple clothes, carry an umbrella and a stick, use footwear, remain cheerful and be of agreeable speech, should have the company of helpful attendants.¹⁷ In the normal course, he would be guided by favorable omens including auspicious messengers for visiting a patient's home where he should take a seat and observe, touch and interrogate the patient. In general, a combination of these three methods would help a physician to diagnose the illness but, it is also said that a diagnosis is possible only by the use of *pancha indriyas* by the physician.¹⁸ The exit of air with bloody discharge in an infected wound can be observed by *pancha indriyas*, cold, heat, smoothness and roughness

can be felt by *sparsanendriya*. Good nourishment, signs of longevity and changes in colour can be visualized by *chakshurindriya*. disorders such as diabetes mellitus can be noted by *rasanendriya* and the odour of fatal ulcers can be assessed by *khrandriya*. Interrogation provides information on the social history of patients, onset of illness, severity of pain, physical strength, appetite, bowel movement, urine output, duration of illness and so on.¹⁹ During the visit the physician should not have close contact with women; indulge in small talk with them, or accept any gift other than food from the ladies as this may defame you.²⁰ Following the examination of the patient, a physician should treat patients whose illness is regarded curable and provide palliation to those who have an illness that is incurable but is amenable to palliation. Illnesses which are more than a year old are incurable and should not generally be accepted for treatment. Examination of patients and the interpretation of findings, can mislead the physician.²¹ The physician faces difficulty in treating clergy, kings, women, infants, timid, elderly and weak persons, government

officers, medical imposters, misers, those who conceal illness, the poor, the short-tempered and orphans .²² A physician guided by this knowledge in practice would be rewarded by virtue, wealth, enjoyment and high repute.

IMPORTANCE OF YOGYĀ:

A student should be made to practice experimental surgery even after he has thoroughly mastered the interpretations of all the treatises. Instructions in the practical methodology should be given regarding excision, incisions etc. One who has not practiced experimental surgery remains incompetent in operations even though he may be well read.²³ *Yogyasūtriya* emphasizes the great need of such a training and describes the methods of experimental surgery using artificial objects for learning the operative procedures like incision, puncturing, extracting, suturing etc., using appropriate principles and instruments. This imparts confidence in the surgeon and precision is his hands without which he cannot function well even if he has full theoretical and scriptural knowledge. After full textual education and practical training through *yogyā* and internship, the well-trained

surgeon should formally enter into house surgeon profession equipped with all necessary regulations as prescribed in *Viśikbānupraveśaniya'* chapter of the *Samhitā*. A physician/surgeon should enter into the professional field after having studied the *samhitha*, having acquired knowledge from *gurus*, having observed practices, having obtained license from the state, having cut his nails and hairs short, being pure and clean, having put on white apparel, having taken umbrella and stick in hand with shoes and unostentatious dress with cheerfulness and pleasant speech, not assuming magical powers, being friendly to all creatures and escorted by good assistants.

HUMAN CADAVER DISSECTION:

Suśruta-Samhitā is the only ancient text which expresses serious concern about the need of cadaver dissection for learning anatomy and surgery. This text not only expresses concern, it also describes the method of cadaver dissection.

EXPERIMENTAL OPERATIVE SURGERY AND INTERNSHIP:

Suśruta-Samhitā includes two small but important chapters describing the basic

tenets of experimental operative surgery for surgical training. The training of surgeons under the *Suśruta* School of Surgery was based on well-established principles, and although the basic sciences were not taught as separate entities, anatomy, physiology, embryology, pathology and psychology were given proper emphasis during the teaching of clinical surgery. The most remarkable was the way in which the students were instructed to practice surgery on various inanimate objects, which would simulate the living conditions of various human organs and structures. And, contrary to the prevalent notion among the historians of medicine, *Suśruta* was the pioneer in teaching of anatomy and actual practice of dissection of human cadaver by the medical students. He particularly enjoined on those who wanted to take surgery as their career, that they must acquire a thorough knowledge of anatomy by direct and personal observation of the structure of the body. The study of vital points and regions of the human body; and the consequence of any injury to these *marmas* was fully emphasized, so that

the surgeon would approach them with proper caution and care.

PRACTICAL TRAINING:

Even after the entire science of *āyurveda* is mastered a student must receive practical training especially in manual procedures such as lubricant therapy and surgery. In the absence of practical training even much learning will not qualify a physician for the practice of medicine. Practical training should be imparted to pupils in models, which stimulate clinical experience. The importance of practicing surgery on objects other than human beings was recognized and emphasized by *Acharya Sushruta*. To obtain complete success in the aimed operating work, practice of similar operations before hand is called *yoga* and performance of such practice is called *yogyā*.

The Experimental Objects:

The different experiments of excision should be demonstrated on pumpkin-gourd, bottle gourd, watermelon, cucumber, *eravāruka* and *karkaruka*. Excisions in the upward as well as downward directions should also be instructed upon these vegetables and fruits.

Experiments of Incision:

The experiments of incision should be demonstrated on leather bag, urinary bladder of an animals and leather bottle full of water and slime.²⁴

Experiments of Scraping:

The experiments of scraping should be demonstrated on a piece of hairy skin.²⁵

Experiments of Puncturing:

The art of puncturing on the vessels of dead animals and on the lotus stalks.²⁶

Experiments of Probing:

The experiments of probing should be demonstrated on moth eaten wood, bamboos, reed-tubes and mouth of a dried gourd.²⁷

Experiments of Extraction:

The experiments of extraction should be demonstrated on jackfruit, *bimbi phala*, the pulp of *vilva* fruit and on the teeth of dead animals.²⁸

Experiments of Drainage:

The drainage should be demonstrated on a piece of *śalmali* wood coated with beeswax.²⁹

Experiments of Suturing:

The experiments on suturing must be practiced on the borders of fine, closely-knitted cloths and on the borders of soft leather.³⁰

Demonstration of Bandaging:

The bandaging should be demonstrated on different parts and subdivisions on the dummies made of cloth.³¹

Experiments of Cautery and Caustics:

The experiments on the use of cautery and caustics should be demonstrated on soft muscle pieces.³²

Miscellaneous Experiments:

Plastic surgery of ear should be demonstrated on soft leather, muscle bellies and lotus stalks. The experiments of application of nozzles of enema apparatus, and the wound irrigation should be demonstrated on the side hole of an earthen pot full of water and on the mouth of a gourd.³³

Modern day training tools:

Modern day medical schools have been using mannequins and 3D stimulators for the practical training of the student. The development in engineering sciences has helped develop internal circuits that are so responsive, just like the normal humans do so getting trained in such a machine is much potent.

DISCUSSION:

The *Suśruta Samhitā* is a fount of knowledge on *Ayurveda*, and an evidence of the surgical genius of *acharya susruta*, who with the

scanty resources available during the *Vedic* and the *Brahmanic* period, turned the art of surgery into science and earned the admiration of the world.

CONCLUSION:

An intelligent surgeon, who does experimental surgery methodically on such articles as stated above, does not lose his presence of mind while doing the actual operations. Therefore, he who wants to be an expert in the use of surgical operations and caustic or thermal cauterizations should practice the same experimentally on similar objects.

The crown of the 'father of surgery' must therefore rest on the head of *sushruta*, who rid the science of medicine of priestly domination, and paved the way for independent rational thinking and sound scientific training of a surgeon.

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