

Principles of Ancient Surgical Training Vis-A-Vis Yogya

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ABSTRACT

Acharya Sushruta, the Father of Indian surgery has contributed valuable knowledge and various surgical techniques in the field of Ayurveda. He was the disciple of *Dhanwantari sampradaya*. *Dhanwantari sampradaya* is considered as the surgical school of ancient era. The efficient skill of a surgeon resides in proper surgical training after attaining full theoretical knowledge. *Sushruta Samhita*, the pioneer authentic text book of *Shalya-tantra* narrates surgical training in its 9th chapter of *Sutra-sthana*, viz., *Yogya sutriya adhyaya*. This review study depicts the importance and relevance of *Yogya* in present era.

Key Words: *Yogya*, Surgical training.

INTRODUCTION

Surgery is an art with principles. For a surgeon, besides having a proper knowledge about surgical anatomy, surgical pathology, tissue respect, he must possess good knowledge about practical application of different instruments and execution of skill.¹ The skill of a Surgeon develops by the proper surgical training. 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*'.² In historical period, the surgical training was commonly performed over animals or vegetables or models of humans made up of clay, and the students of medical profession used to practice on those things. Herodotus, the Greek historian quoted that the practice of medicine is very specialized among Indians. Each physician treats just one disease. The country is full of physicians, some treat eye,

some the teeth, some of what belongs to the abdomen, and others internal diseases.³ Acharya Sushruta treated numerous diseases by surgery, para-surgical procedures and also conservative therapy. *Sushruta Samhita* elaborates Surgical anatomy, Surgical Instruments, various Surgical procedures, etc. It has contributed special techniques for hands-on-training on various objects to acquire perfection in surgical skills for a scholar who would enter into the surgical profession. According to Acharya Sushruta 'Hand is the best or superior most instrument'. He gave the explanation that all the instruments are subsidiary to hand. Without hand, we cannot perform any surgical skill.⁴

In *Sushruta Samhita SutraSthana*, *Yogya Sutriya Adhyaya*, skill enhancing techniques have been mentioned regarding how to make a *Shalya* scholar perfect in performing surgical practices. *Sushruta Samhita* explains eight type of *Shastra karma* used for surgery which are very

relevant and practiced today also.⁵ Practical surgical training of scholars was mainly taught over some common objects that were easily available on those days.

The different ways of *Chhedhana* (Excision) were demonstrated on the fruits of Bottle gourd, Pumpkin gourd, Cucumber, Water Melon etc.⁶ For *Chhedhana* procedure, instruments like *Mandalagra*, *Karapatra*, *Vrdhipatra* etc. were used.⁷ While comparing the diseases that are indicated for *Chhedhana* procedure and the objects used for surgical training of excision, have some similarities in shape, thickness, smoothness, etc. While practicing *Chhedhana* over those objects like cucumber, one gets an idea about how to hold instruments for *Chhedhana* and how much amount of strength should be applied and which type of *Chhedhana* instrument to be selected for a particular *Chhedhya roga*.

Bhedhana (Incision) should be imparted on Leather bag, Urinary bladder of dead animals, Leather bottles, etc.⁸ filled with watery mud. *Vrdhipatra*, *Nakha Sastra*, *Mudrika*, *Utpalapatraka* and *Ardhadhara* are used for *Bhedhana* procedures.⁹ Those objects mentioned for training of *Bhedhana* and the diseases mentioned under *Bhedhya rogas* having similar shape and feel on touch. These are some of the diseases which are mentioned under *Bhedhya rogas* like *Granthi* (Cyst), *Vridhi* (scrotal enlargements), *Prameha pidaka* (Carbuncles), etc.¹⁰ A common characteristic feature is usually observed; these diseases contain pus or some other liquid material occupying inside it. So, while practicing *Bhedhana* in these objects it gives a good idea about how to hold the instrument for the incision procedure, how much pressure should be applied or how to make an incision in one stroke, etc.

Lekhana (Scraping) can be practiced on piece of hairy skin with the help of instruments like *Mandalagra* and *Karapatra* etc.¹¹ By the proper practicing of *Lekhana karma* one can apply this procedure to treat the conditions like Vitiligo, Ulcer margins, Keloid, Hypertrophied muscle, Cyst,

Patches of skin, etc.¹² While practicing *Lekhana Karma* on the surface of skin having hairs, it gives an idea about the handling of instruments, how much pressure to apply on the skin for scraping, etc. In the management of *Kushta*, *Brihatrayis* clearly explain that *Kushta* having the characteristics like immobile, hard and circular patches should be treated with proper fomentation followed by *Lekhana*.¹³ So *Lekhana* is a procedure having more importance in skin diseases. Regular practicing of *Lekhana karma* makes the medical student capable of treating skin diseases.

Vyadhana (Puncturing) can be practiced using veins of animals or Lotus stalk.¹⁴ *Siravyadha* is one of the *Shastra Karma* out of eight and same as one of the *Upakrama* out of sixty described in *Sushruta Samhita*. *Siravyadha* is considered as *Ardha chikitsa* in *Shalya tantra*, so every student of *Shalya tantra* should have the practical knowledge and proper training in *Siravyadha*. Acharya Sushruta mentioned veins of animals and Lotus stalk for the practicing of *Vyadhana karma* because the veins of animals are similar to humans and the stalk of Lotus possesses morphologically similarity to the superficial veins of human being. Acharya Sushruta clearly mentioned that in muscular areas, puncturing should be of the size of *Yava* (barley grain), in other areas it should be $\frac{1}{2}$ *Yava* or one *Vrihi* (rice) using a *Vrihimukha Shastra*. Veins on the bones should be punctured to the size of $\frac{1}{2}$ *Yava* using a *Kutharika Shastra*.¹⁵ So at first, one should practice *Siravyadha* in objects like Lotus stalk and animal veins, which gives an idea about the puncturing regarding its depth, penetration, handling of instruments, pressure to be applied on the veins, etc.

Eshana karma (probing) should be practiced on Moth-eaten wood, tube of bamboo and reed, and mouth of dried bottle gourd.¹⁶ These objects have multiple holes or pores and are hollow inside. While practicing the *Eshana Karma* in these objects, students will get the feeling of

probing in sinus and fistulous tract. *Kshara sutra* management for Fistula in ano and Pilonidal sinus is considered as the effective as well as complication-free method of treatment modality. So, the regular practicing of *Eshana Karma* will help the scholar to achieve the clinical skill to understand Fistulous tract, sinuses, cavities, etc.

Aharana Karma (Extraction) is act of removal of foreign body by pulling, and should be practiced on fruits having seeds like Jackfruit, *Vilwa*, *Bimbi* and also on teeth of dead animals.¹⁷ So, the practical training of *Aharana* will help to learn the removal of impacted foreign body, stone, Faecolith, etc. skillfully.

Visravana Karma (Drainage) should be practiced on planks of *Salmali* wood pasted with bee-wax.¹⁸ This method is used to remove the abnormal collection of fluid in body cavities. Bee wax coated *Salmali* wood gives the feeling of fluid filled cavity during incision. Proper training on *Visravana* makes the student capable to manage different types of Abscess, Cysts, Spongy gums, etc.

Seevana (Suturing) should be practiced between the two edges of fine and thick cloth and on the borders of leather.¹⁹ Suture is a stitch or series of stitches made to secure opposition of the edges of a surgical/traumatic wound. Acharya Sushruta indicated numerous suturing conditions, such as diseases arising from *Medas*, *Bhinna vrana*, *Saddyo vrana*, wounds over the movable joints, etc.²⁰ Suturing of wound is an extremely important surgical skill to learn and become competent. So, every medical student should have proper training on *Seevana*.

Bandhana karma (Bandaging) is elaborately described in *Sushruta Samhita*. Total fourteen *Bandhanas* are described for *Vrana bandhana*. *Bandhana* should be practiced on different parts of the dummies made up of cloth.²¹ A suitable *Bandhana* helps for protecting the wound, promoting healing and providing, retaining or removing moisture. *Bandhana* can be used

to hold dressing in place, to relieve pain and generally to make the patient comfortable.²²

Kshara karma and *Agni karma* are considered as the para-surgical procedures in *Ayurveda*, which are used to treat numerous diseases without recurrence. These procedures must be cautiously used on suitable points of the body otherwise it can result in serious trouble to the patient. Thus, one who wish to become an expert in *Kshara karma* and *Agni karma* should practice on objects like Soft muscle piece.²³

Yogyasutriya chapter also mentions about *Karna-sandhi Bandhana*, and for its practice, use of soft skin, muscles and hollow stalk of Lily plant is indicated for fabricating the ear, joining severed ear and bandaging.²⁴

Acharya Sushruta has also described the training for *Vasti karma*, *Vrana prakshalana*. It should be practiced on the side hole of an earthen pot filled with water or on the mouth of gourd.²⁵

Acharya Sushruta has followed *Dhanwantari sampradaya*. In every chapter, he started with due acknowledgement, viz. 'I am going to explain this chapter as propounded by Lord Dhanwantari'. Sushruta had the desire to make skilled surgeons exactly similar to Dhanwantari sampradaya. In *Yogya sutriya*, the first sloka explains that the disciple, even having studied the entire scripture should be subjected to practical work, he should also be given instruction on the way of practice in *Sneha*, *Vamana*, *Virechana*, etc. or eight surgical operations. One, even having acquired great learning, is unfit for the profession if he has not done the practical work, that's why the practical training for surgery on common objects like vegetables, clothes etc. was emphasized on those days.

These concepts of Sushruta can be seen in surgical skills through simulation-based learning technique. Simulation based learning in surgery is a learning model where an environment similar to real life surgical situation is created for the trainee to learn various surgical skills. Current simulation models including cadaveric,

animal, bench-top, virtual reality robotic simulators, which are increasingly used in surgical training programs. These techniques help for repetitive practice on non-living things so that the operator can be near perfect when operating on live patient. For example, subcutaneous tumor or cysts are simulated using cut finger of glove filled with tooth paste or balloon filled with ink or small lemon. These are inserted into chicken thigh or pig muscle and used as bench models. Another example of learning simulation surgery can be used for learning hair transplantation where artificial hair may be transplanted to pig skin.²⁶ For the training of incision and suturing, the students make a mark on the peel of the fruit or vegetable, and then make the incision in the previous mark and suture are made to close the edges of incised area. By this way, different incisions and sutures can be trained. A great similarity between Sushruta's concept of surgical training and simulation based surgical training is evident, that's why Acharya Sushruta is considered as the Father of Surgery and also Father of Plastic Surgery.

Yogya is preferably for 'योग्य शिष्य' (competent scholar), which means an able individual who is intelligent or good at doing something skillfully. If a scholar has thorough theoretical knowledge of authentic texts (*Shaastras*) but has not undergone the practical training then he is *अयोग्य* (not fit) to perform *Shastra karma* or various surgical procedures. A comprehensive training for a *Shalya* scholar incorporates a series of sequential steps, viz.

- I. Go through the theory.
- II. Learning the standard protocol by watching keenly every step and practicing on different inanimate objects
- III. Assist your seniors
- IV. Execution of procedures independently
- V. Repetition of the surgical procedures, which imparts perfection and boosts the confidence. Moreover, this regular practice also minimizes the chances of failure. Because, more is the experience,

better and complication-free are the results.

A *Yogya* scholar by enhancement of his skill learns the correct execution of the surgical techniques, minimizes the post-operative complications and ultimately become capable of treating the patients with best positive outcome.

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