



A REVIEW ON MRITASHARIRSHODHAN PADDHATI AS PER AYURVEDA & MODERN MEDICAL SCIENCE

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ABSTRACT

Acharya Sushruta was an ancient surgeon, father of surgery & an author of the *Ayurveda* book *Sushruta Samhita*. According to *Sushruta Samhita*, to become a best physician & surgeon the dissection of the dead body is very essential. For dissection of the dead body, preservation with an efficient method is needed. A special method for dead body preservation is given by *Acharya Sushruta* which known as "*Mritasharirshodhan*". *Acharya* said that the theoretical as well as practical knowledge is very necessary for the understating of the concept related with human body. In the *Ayurvedic* science, under *Mritasharirshodhan*, we studied how the body is collected, where it will preserve & method of preservation etc. Modern dead body (cadaver) preservation method is different from the *Ayurveda* method of preservation. In modern medical science Anatomy is the basic knowledge of surgery. Hence, cadaveric study is not only limited in dissection but also helps to identify human body internal & external structures, its courses, relations and variations which is possible only if cadaver is embalmed properly.

KEYWORDS: *Mritasharirshodhan*, Preservation, Cadaver, dissection, embalmed.

INTRODUCTION

In science theoretical as well as practical (Subjective and objective) knowledge is essential for the perfection. Dead body (Cadaver) study plays important role for practical knowledge as well as theoretical knowledge to understand subject properly. Cadaveric dissection is a best tool in learning the concepts of gross human anatomy. That is why *Acharya Sushruta* has laid emphasis on *Pratyaksha-Gyan* and *Shastra-Gyan*. Therefore he has emphasized on preserving and dissecting the cadaver.^[1] *Mritasharirshodhan Paddhati* denotes dead body preservation and dissection procedure in *Ayurveda* literature. There are many different methods of dead body preservation in modern medical science. *Acharya Sushruta* gave the detail description of dead body preservation with dissection procedure. For medical students Dissection is the base of practical knowledge of human anatomy and for that purpose, there is a need of preservation of human dead body. *Acharya Sushruta* mentioned about selection criteria of dead body, its preservation and carried out dissection for the first time in the field of medical profession.^[2] For better practical knowledge it is essential to have better knowledge of subject the process of *Mritasharirshodhan Paddhati* or embalming had introduced in our ancient literature. Here author has made an attempt to review all

the ancient literature regarding the *Mritasharirshodhan* with the concept of embalming process which mentioned in medical science.

AIM AND OBJECTIVES

1. To explore the knowledge of preservation of the deadbody mentioned in *Sushruta Samhita*.
2. To explore & interpretation the process of preservation as described in *Ayurveda* & contemporary science.

MATERIAL AND METHODS

Literary and conceptual study had been done with the help of *Ayurvedic* texts like *Sushruta Samhita*, *Ghanekar* & English commentary on *Sushruta Samhita*, & other *Ayurveda* books with modern medical science literatures & e-websites. Few published articles references was correlated, analyzed and interpreted with the knowledge of contemporary science on the subject.

Ayurveda review: *Mritasharirshodhan Paddhati*

In *Ayurveda*, the process of embalming has described by *Acharya Sushruta*. In medical science the surgeon desiring to have the exact knowledge of *Shalya-Shastra*, should thoroughly see all parts of dead body after its

preservation. The practical knowledge along with theoretical knowledge is very essential. Whatever is seen while doing practical study and going through *Shastra* (concerned literature), adds the knowledge, when both are applied together¹. Therefore, one who intends to acquire definite knowledge of surgery should study the anatomy practically by dissecting the dead body properly. For that purpose *Acharya Sushruta* had explained the following guidelines for embalming and dissection. According to *Acharya Sushruta* - Cadaver should be.^[3,4]

1. **Samastagatram:-** To acquire normal anatomical knowledge, the cadaver you need to preserve should not have any congenital malformation as the dead body should be with its whole appropriate shape and sized *Angapratyangas* (components of body). It means all parts of body should be in their natural numbers. There should be no extra or no less organs or defective part in the body.^[4,5]
2. **Avishopahatam:-** The entire body of person should not die of poisoning because poisoning will damage body structures. The affected part does not remain natural and wrong knowledge of structure will be gained. So, poisoning should not be the reason of death.^[4,5]
3. **Adeerghavyadhipeeditam:-** According to *Acharya Sushruta* the dead body should be free from any type of chronic disease. Because these kinds of diseases damage the body parts like as in leprosy skin is damaged, in syphilis nasal bone and other bones are damaged, in gonorrhea penis is damaged etc. This kind of body gives us wrong information about the study of body parts.^[4,5]
4. **Avarshashatikam:-** *Sushruta* refuses to take old person's body as well as children's body. Because old person's body parts are get degenerated like, Changes in body structures as skin, bones, muscles ligaments etc. old female body uterus get shrinks. The parts of the body among children are not properly developed compare to adult body. So we cannot find the actual body structures in children. In ancient time the maximum age limit is 100 years so above this age the person considered old, Hence *Sushruta* told the term *Avarshashatikam* which means not above the 100 years. But in present era average age level diminished so we can take body having age of 50 to 55 years.^[4,5]
5. **Nisrushtaantrapureesham:-** According to *Acharya Sushruta* intestine along with fecal material should be removed because many bacteria present here and they fastly decomposed the dead body. There are two kinds of benefit here for removal of intestine with faeces that body not decomposed by bacteria and intestine available for specimen purpose.^[4,5]
6. **Avagahntyamaapgayam:-** According to *Sushruta* dead body should be well tied and kept in river which has slow running stream so that dead body keep contact continue with water and skin get soft

and moist and easily separate from the body. This also prevent from bed odour so cadaver to carry out dissection easily without any difficulties.^[4,5]

7. **Nibadhham:-** Cadaver should be tied. So that cadaver neither flow nor drown and remain stable in water.^[4,5]
8. **Panjarastham:-** The body should be kept in a cage placed in a flowing river. The cage should make up of using bamboo or iron to protect cadaver from aquatic and other carnivorous animals.^[4,5]
9. **Munjavalkalkushshanadinam Anyatamen Aaveshtita Angpratyangam:-** The dead body Should be wrapped with one of *Munja, Valkal, Kusha, Sana* etc. due to this wrapping the dead body can be protected from the small water living organism.^[4,5]
10. **Aprakashdeshe Kothayet:-** According to *Sushruta* dead Body should be kept in hidden dark place and allowed to undergo decomposition. The *Aprakashdeshe* (dark place) is one where there is no movement of people or movement happens hardly. Second reason is that the water from dark place is neither seen nor used by people; hence the changes of infection spreading in them may not possible. And another reason due to less movement of the individual in that dark place, the possibility of tampering with the body can reduces.^[4,5]
11. **Samyak Prakuthitam Udhrutya Tato Deham Saptaratrat:-** After seven days knowing that dead body has become properly putrefied, it should be taken out and wrapping removed.^[4,5]
12. **Ushir Bala Venu Valkala Kurchanam Anyatamen Shanai Shanai Avgharshyanstvagin Sarvaneva Bahyaabhyantarangpratyang Visheshan Yathokran Lakshaye chhks.**^[5]

Scrubbing the dead body slowly with brushes made from *Usheer* (grass), *Bala* (hairs), *Venu* (bamboo), *Valkala* (inner bark of trees), *Kurcha* (grass part of *Panch Trinamoola*) or any other similar material and then the body with all the *Bahya* (external) and *Abhyantara* (internal) parts like the skin, bones, muscles etc. should be fully observed by eyes. The reason behind slow scrubbing of dead body is to see the minute structures of body parts and different skin layers mentioned by *Acharya Sushruta*.^[6]

Modern Review: Embalming

In modern the method of preservation is totally different from the *Ayurveda* method. But the selection criteria are same as *Ayurveda* only difference is that dead body has age about 55-60 years due to new life span of individual.

In modern, embalming is the treatment of the dead body coagulated, with antiseptics and preservatives to prevent putrefaction. By this process proteins are tissues are fixed, organs are bleached and hardened and blood is converted into a brownish mass. Embalming produces a chemical stiffening similar to rigor mortis, and normal rigor does not develop.^[7]

Embalming rigidity is permanent. Decomposition is inhibited for many months, if the injection is made shortly after death, and if done several hours after death, the body will show mixture of bacterial decomposition and mummification, and will disintegrate in a few months.

Embalming alters the appearance of the body, tissues and organs, making it difficult to interpret any injury or disease. Embalming completely destroys cyanide, alcohol and many other substances. Determination of the presence of many of the alkaloids and organic poisons becomes very difficult. The fixation process makes it difficult to extract drugs. Blood grouping cannot be made out. Thrombi and emboli will be dislocated and washed away.

A body weighing 70 kg will require a fluid equivalent of ten liters. About 10% of it will be lost through venous drainage, purging, etc. To be very satisfactory, embalming should be done within six hours of death.^[7]

Table 01: A typical embalming fluid.^[7]

Ingredient	Proportion
Formalin	1.5 liters
Sodium borate	600 gm
Sodium citrate	900 gm
Glycerine	600 gm
Sodium chloride	800 gm
Eosin (one percent)	30 ml
Soluble wintergreen	90 ml
Water	Up to 10 liters

Sodium borate and sodium citrate should be dissolved in hot water and allowed to cool. Add rest of the components and dilute with water to make up ten liters. Allow to stand for a few hours and filter. After preparation of embalming fluid we can enter the embalming fluid through common carotid artery or femoral artery in arterial embalming.

DISCUSSION

1) Discussion over the selection criteria of the cadaver

While selecting a dead body the criteria prescribed are very significant; body which is deprived of any of its parts does not furnish complete and correct information; if dead by poison the qualities of tissues and organs will have undergone abnormal changes (in their colour, texture etc); if dead by long standing diseases, tissues and organs will have become greatly emaciated. losing their normal qualities (shape, size, colour, texture etc); if dead by old age (hundred and more years) many tissues and organs will have become greatly shrunk in size, lost their qualities, devoid of moisture, (unctuousness), falling away of teeth and hair, appearance of wrinkles on the skin and many such changes which are likely to be mistaken as normal. Removing the faeces from the rectum is to ward off offensive smell. Wrapping the body

with grass etc is to prevent damage of the body by fish and other insects which dwell in water.

2) Discussion over the preparation of the cadaver before dissection

Keeping the cadaver inside a cage (probably made of reeds) was to prevent the body from moving away in the current of water or being damaged by animals and birds of prey; keeping the cage in a concealed/hidden place was meant to avoid unwanted persons who may interfere in one way or the other with the work of dissection. Allowing putrefaction is meant to make the body soft and easy for dissection. Though putrefaction creates obnoxious smell, it will be less in case of running water.

3) Discussion over the process of dissection

After 7 days when cadaver gets fully putrefied, Scrubbing the skin and other soft structures was being done with brushes of soft or hard bristles, pieces of bamboo made thin and sharp was being used to split, separate hard structures like ligaments, bone etc. completing the dissection and to carefully observe all the parts (starting from the external skin reaching deeper structures) was probably considered sufficient for the purpose.^[8]

4) Discussion over the drugs used in wrapped the cadaver

These are the drugs explained by our *Acharyas* for wrapped/binding the cadaver, by using one of the plants like *Munja*, *Valkal*, *Kush*, *Shana* etc or others with similar properties.^[9,10]

1. **Munja:** (*Saccharum Munja* Roxb- gramineae) - Source of natural fibers.^[11]

2. **Valkala:** 5 Plants are considered in *Valkala* –

1. *Nyagrodha* (*Ficus bengalensis* Linn.),
2. *Udumbara* (*Ficus glomerata* Roxb.),
3. *Ashvatha* (*Ficus religiosa* Linn.),
4. *Pareesha* (*Thespesia populnea* Soland.) and
5. *Plaksha* (*Ficus lacor* Buch.Ham.)

All these 5 plants contain tannins having antiseptic, Anti-inflammatory, Antioxidant, Antibacterial, Antimicrobial, Wound purifying and Healing, and Astringent In *Ayurveda* these five are called *Panchavalkala* which is *Shothahar* (reduces swelling) and *Vranaropaka* (helps in wound healing) As these properties helps in dead body preservation, *Acharyas* have mentioned *Valkala* to wrap the dead body while preserving

3. **Kusha** (*Desmostachya bipinnata* Stapf): Antibacterial effect against gram negative and gram positive organism, Astringent, Antiseptic and toning properties. This property of *Kusha* helps in protecting the dead body from putrefaction by bacteria.^[11]

4. **Shana** (*Crotalaria juncea*) Source of natural fiber, Antimicrobial Activity Astringent (tends to shrink body

tissue) this astringent property helps in shrinking swollen tissues of dead body.^[12]

Plants of genus *Crotalaria* have been found to possess significant antimicrobial activity. Brushes should be made for the dissection purpose of *Usher*, *Baal*, *Venu* using anyone among mentioned drug or any other similar material should be used in the form of *Kurcha*. Using above drugs in the form of *Kurcha* helps easy for dissection by scrubbing the cadaver, from external to internal, and one can visualize superficial fascia till deep structures using this method.^[13]

CONCLUSION

Acharya Sushruta is the first medical man of India of the ancient period who resorted to human dissection to understand the structures of the body in detail. Because of the unique method of scraping the body layer by layer, he was able to note the features of various tissues and organs scrupulously and describe them fairly accurately. The process of *Sushruta's Mritasharirshodhan Paddhati* & modern embalming process are different but outcomes from the both processes are much similar.

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