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ANCIENT AYURVEDIC AND MODERN METHOD OF PRESERVATION AND DISSECTION OF CADAVER: A REVIEW

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ABSTRACT

MahrishiSushruta was an ancient surgeon (who was possibly born in 2nd century BC) and he was the author of the book *Sushruta Samhita*. According to *Susruta* to become a best physician & surgeon, the dissection of the dead body is very necessary. For dissection of the dead body preservation with a good method is necessary. According to *Ayurveda Sushruta* was the father of Surgery. Dissection and preservation described by *Sushruta* in *Sushruta Samhita* is in brief. According to *Acharya Charaka,* knowledge of *Shuksam* and *SathulShariris* are very necessary for the *Sharir Rachana*. The theoretical knowledge learnt from the teacher & observed in the practical classes should be supplementary to each other. An effort is made by collecting all available literatures in the *Ayurvedic* science, how the body is collected, where it will be preserved and methods of preservation etc. Modern preservation method is different from the *Ayurvedic* method of preservation.

Keywords: *MahrishiSusruta*, dead body preservation, points of body, dissection, etc.

INTRODUCTION

Charaka Samhita and *Shusruta Samhita* are the two-basic literature of *Ayurveda*. *MahrishiSushruta* was an ancient surgeon. There are many evidences which prove that *Susruta* had lot of knowledge about *Sharir Rachana* in details. *Susruta* describes about the preservation and dissection in details. *Shusruta Samhita* emphasized surgical matters, including the use of specific instrument and types of operation. There is also convincing evidences suggesting that the knowledge of human anatomy was revealed by both inspection of the surface of the human body and through human dissection as he believed that student aspiring to be surgeons should acquire a good knowledge of the structure of the human body.

The advancement of surgery during ancient Indian medical history is significant when considering the obstacles that hindered the study of anatomy. According to Hindu texts, the human body is sacred in death. Hindu law states that body should not be violated by knife and those under age of 2 years must be cremated in their original conditions. *MahrishiSusurta* was however, able to bypass this decree and achieve his remarkable knowledge of human anatomy by using a brush type broom, which scrapped off skin and flesh without the dissector having to actually touch the

warps. The dissector requires one scalpel with a solid blade, two pairs of forceps, preferably with rounded points, a strong blunt hook or seeker, and a hand lens. The lens is especially useful as an aid to bridging the gap between gross and microscopic anatomy and can also help to throw light on the functions of many tissues.

There are some points which have important for preserving a dead body

- Dead body should have all body parts. (1)
- Death is not due to any chronic disease.
- Death is not due to poison.
- Dead body should be of age below 100years.

Preservation material:

- Extreme cold rivers slow flowing water(2)
- *Bambu*cage
- *Munja*
- *Kusha* (Dharbha)
- *chal*
- *Kshan*

Method of Preservation:

First of all dead body collected and then remove the *antargata mala* (intestinal faecal). After that the dead body is bind with any one of Munja*, Kusha* (Dharbha), *chal, kshan*, and covering with a cage. The cage with dead body put into the cold slow river for 7days. After 7 days the body collected from the river. (3) Firstly collect the dead body then put the body on the dissection table in dissection hall in the supine position. A pot filled with preservation fluid placed above the surface of the dead body. Then feel or trace the inguinal ligament in between anterior superior iliac spine and pubic tubercle. See the femoral sheath after take an incision below the 4 cm of inguinal ligament. In femoral sheath, the femoral artery is present laterally and femoral vein medially. A canula is fixed into the femoral artery and transfers the preservation fluid from the pot into the body through this canula and pass the fluid in body. 5-7 litres fluid required for the preservation of a single body. We can confirm after pricking with the all-pin on the various point of the body for presence of fluid in all part of body.

We can also preserve the dead body through the common carotid artery.

According To Ayurveda Dissection Method Of Dead Body

Therefore one who intends to acquire definite knowledge of surgery should study the anatomy practically by dissecting the dead body properly. Whatever is practically seen and whatever is known from scriptures both combined together develops the knowledge further.(4)

Hence the entire body of the person not died of poisoning or chronic disease, not of hundred years and of which faces river and having been wrapped with one of *munja*, bark, *kusa*, *sana* etc. Should be made to decompose in a dark area, then after a week, when the body is fully decomposed it is taken out and slowly rubbed with brush of one of *ushira*, hair, bamboo and balvaja while observing all parts and sub-parts, externally as well as internally(5).The pervading and subtlest consciousness in the body can't be perceived by eyes as it is experienced only with the eyes of knowledge and penance.(6)He is the expert who has observed and understood the entities in the body and scripture. One should proceed for action after removing his doubt by observations and study. (7)

Modern Preservation Method-

Introduction:

Cadavers have on tribute to body science and medical student often use cadavers to study anatomy cadavers are often used to verify surgical techniques before moving on living patients while many schools prefer different modes of teaching by using technology and surgical models for students. Cadavers are still needed for hands on learning. Gross anatomy a common course in medical school studying the visual structures of the body gives student the opportunity to have hands on learning environment. The needs for cadavers have also grown outside of academic programs for research.

The methods of preserving cadavers have changed over the last 200 years. At that time cadavers had to be used immediately because there were no adequate methods to keep the body from quickly decaying.

Preservation was needed in order to carry out classes and lesson about the human body. Glutaraldehyde was the first main chemical used for embalming and preserving the body although it leaves yellow stains in the tissue, which can interfere with observation and research. Formal dehyde is the chemical that is used as the main embalming chemical now. It is a colourless solution that maintains the tissue in its lifelike texture and can keep the body well preserved for an extended period.

Aim and objective:

1. To explore the knowledge of preservation and dissection of the dead body.
2. To know about the difference between the modern and *Ayurvedic* method of preservation and dissection.

Examples of preservation of dead body in past:

1. The Vedic period: There is reference regarding preservation of dead body of Raja Dasharatha in *tailadrona.*
2. Pyramids of Egypt: Pyramids of Egypt's are known for the preservation of dead body before many centuries. [8]

Review of Literatures:

Preservation of the dead body is to safe for a longer time because there is no effect and harm to the body because structures are preserved & they can be easily observed and it is must to become a physician and surgeon.

AcharayaSusruta describes dead body preservation in Sushruta Samhita 5th chapter.

In modern, the method of preservation is totally different from the *Ayurveda* method. [9]

There are some points which are important to preserve a dead body: That all the limbs are intact.

- No injury present in the any part of the body. [10]
- Death is not due to any chronic disease.
- Death is not due to intake of poison.
- Death is not due to any epidemic disease.
- Dead body after the process of post mortem is not preserved.
- Dead body has age about 55-60years.

Purpose of Preservation

•According to modern; to safe& preserve the body for longer time and for easy observance of structures.

Table 1: Preservation material: [11]

Sr.No.	Name of preservative fluid and instruments	Quantity
1.	Carbolic acid or Phenol	1lt.
2.	Formaline	4lt.
3.	Glycerine	2lt.
4.	Spirit	3lt.
5.	Tarpentine oil	300ml
6.	Water	3lt.
7.	Staining fluid	--
8.	Red lead	200mg.
9.	Water	2lt.
10.	Pot	1
11.	Canula Thared	1
12.	surgical blad	1
13.	Scalpel	1

Showing table contents of preservation

General Introduction of Body Part and Position:

For descriptive purposes the human body is divided into head, neck, trunk, and limbs. The trunk is subdivided into chest or thorax and belly or abdomen. The abdomen is further subdivided into abdomen proper and the pelvis. The student acquires first-hand knowl-

edge of the relative positions of the various structures in the body by dissecting into it region by region. He requires an anatomical vocabulary which must be adequate to define precisely the relevant positions of these structures, and he should have an elementary knowledge of the kinds of structures he will encounter- this is the purpose of the following introduction.

The body, or any detached part of it, usually lies horizontally on a table during dissection, but the dissector must remember that terms descriptive of position are always used as through the body was standing upright with the upper limbs hanging by the sides and the palms of the hands directed forwards. This is called as the anatomical position. Different structures are met in dissection skin, superficial fascia, vessels, blood vessels arteries, blood capillaries, veins, lymph vessels, nerves, spinal nerves, deep fascia, muscles, bones, joints, organs. [12]

Method of Modern Dissection:

Instruments: [14]

Deep to the skin, the body consists of a number of organs embedded in a matrix of fibrous connective tissue (fascia) which varies in density from a loose mesh to tough sheets or bundles of fibres. Dissection is the process of freeing the organs from this tissue and demonstrating the variations in its density. This can best be done by blunt dissection with a hook or forceps by pulling these through the loose layers of connective tissue. In this way it is possible to free organs without damaging blood vessels or nerves, the knife being reserved for cutting the skin and the dense layers of deep fascia which enclose many organs and partly conceal them.

Removal of the Skin:

One method is to remove the skin from the superficial fascia in a series of flaps which can be replaced to obviate drying of the part. It is probably better to cut through both skin and superficial fascia and remove both of them in one layer from the underlying deep fascia by blunt dissection. The blood vessels and nerves entering the superficial fascia through the deep fascia are easily found in this way and can be traced for some distance. The alternative of searching for their minute branches in the superficial fascia is a tedious and often unrewarding process. The student should be aware that the distribution of cutaneous nerves is of considerable clinical importance, but this is best learnt by reference to diagrams except in the case of the larger branches which are easily followed. In the superficial fascia, the nerves are almost always accompanied by a small artery and one or more minute veins. Larger veins also found in the superficial fascia. They run a solitary course to pierce the deep fascia and drain into the deep veins. At such junctions, these superficial veins contain valves which prevent the reflux of blood from the deep veins.

Deep Dissection:

When the deep fascia has been uncovered and examined, proceed to remove it. This is made more difficult because it sends sheets between the various muscles enclosing each in a separate tunnel. Where a number of muscles arise together, the walls of these tunnels also give origin to muscle fibres and thus they form a tendinous sheet which appears to bind together adjacent muscles. Elsewhere it is relatively easy to strip the deep fascia from muscles for only delicate strands pass between the individual bundles of muscle fibres. It is important to follow each muscle to its attachments and to define these accurately, for it is only in this way that the functions of a muscle can be determined.

As each muscle is exposed and lifted from its bed, look for the neurovascular bundle entering its surface. Follow the structures in the neurovascular bundle back to the main nerve trunk and vessels from which they arise. Once these have been identified, it is relatively easy to follow them by blunt dissection and determine their other branches. In many situations it will be found that the arteries are accompanied by tributaries of the main vein which often obscure the artery and nerve. In these cases it is usually advisable to remove the veins so that a clearer view of the other structures can be obtained. In any case it will be found that there are usually multiple venous channels and that their arrangement is much less standard than that of the

arteries. The arteries are less constant in their arrangement than the nerves.

DISCUSSION

There are much evidence found in old texts which gives knowledge about preservation and dissection of dead body. *Susruta* describes about the scientific method of preservation and dissection. According to *Susrata* if someone wants to preserve a dead body then firstly place it in slow flowing river water. *Susruta* advised to preserve dead body which contains all body part so that one can learn about whole body. If death occurs due to chronic diseases there may be changes in the internal or external part of the body.

Sushruta also advise not to preserve body whose death occurs due to the intake of poison because, there may be chances of decomposition of tissues due to poison of dead body. Thus one should preserve a body in which natural death occurs.

According to Sushruta with the help of *kusha, khasha, bark* starts the dissection of dead body after 7days of preservation.

Sushruta also advices not to use sharp end instrument for the dissection. According to him one can get detail knowledge with the help of bark, *kushakhasha* in dissection.

According to modern science there are three method of dead body preservation.

1. Saturated salt solution.
2. Formaline solution.

These courses using cadavers have been performed to advance surgeon's techniques without any risk to patients. These methods are the suitable for specimen. In addition, the infection risk and cost involved in using cadavers are problems that need to be solved. This method had a sufficient antibiotic effect and produced cadavers with flexible joints and high tissue quality suitable. It prevents the entry of putrefying organism.

CONCLUSION

Preservation of dead body is must for dissection. *Ayurveda* and modern science both had explained about the preservation in different ways. In *Ayurveda* method of preservation is simple and natural. In *Ayurvedic* method no chemical is used for preservation but in modern method of preservation many chemical agent are used. These chemical agents may be harmful effect and decomposition on the dead body. Thus after this review we can say that *Ayurveda* method of preservation is natural and safe, simple we can preserve a body in minimum cost with *Ayurvedic* method of preservation but still there are limitations in this regard.

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