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A CRITICAL REVIEW ON AYURVEDIC AND MODERN METHOD OF PRESERVATION AND DISSECTION OF DEADBODY

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ABSTRACT

The author of the Sushruta Samhita, Mahrishi Sushruta, was an ancient surgeon who lived during the second century BC. Sushruta is credited as being the founder of surgery in Ayurveda. Sushruta describes dissection and preservation in the Sushruta Samhita. According to Acharya Charaka, knowledge of Shuksam and Sathul Shariris are very necessary for the Sharir Rachana. As per Shusruta to become a best Physician & Surgeon the dissection of the dead body is very necessary. About 5000 BC, evidence of body preservation is recorded in the Ramayana chapter Ayodhya Kanda. Similarly, the Ayurvedic Classics, specifically the Sushruta Samhita, describe body preservation and are the first to discuss the preservation and selection of cadavers. The Ancient Egyptians also believed that the preservation of the mummy empowered the soul after death, which would return to the preserved cadaver. Arsenic was widely employed as an embalming fluid in the 19th and early 20th centuries, although other more potent and less hazardous compounds have since replaced it. The Need for Preservation was for Long before early practitioners of medicine in India began dissecting cadavers to study the human body. Modern preservation method is different from the ayurvedic method of preservation.

KEYWORDS:- Mahrishi Sushruta, Dead body preservation, Dissection.

INTRODUCTION

The two primary texts of Ayurveda are the Charaka Samhita and the Shusruta Samhita. Ancient surgeon Mahrishi Sushruta was a physician. There are numerous examples that show Sushruta had extensive understanding of Sharir Rachana. Sushruta goes into great depth on the preservation and dissection. The Shusruta Samhita placed a strong emphasis on surgical issues, such as the usage of particular instruments and sorts of operations. There is also strong evidence to support the idea thatknowledge of human anatomy was disclosed by both surface examination of the human body and human dissection, since he felt that students hoping to become surgeons should gain a solid understanding of the human body's structure.

The procedure of cadaver preservation involves treating the corpse with or without chemicals tokeep it safe for a long time so that it can be studied on a macroscopic to microscopic level. The practise of chemically treating a deceased person's body or individual organs to fend off the forces ofdecomposition.

Mahrishi Sushruta 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.
- Death is not due to any chronic disease.[1]
- Death is not due to poison.
- Dead body should be of age below 100years.

Preservation material

- Extreme cold rivers slow flowing water[2]
- Bambucage
- Munja
- Kusha (Dharbha)
- Chal

- Kshan

AIM AND OBJECTIVE

To evaluate techniques of dead body preservation described by Acharya Shusruta. To explore the knowledge of preservation and dissection of the dead body.

To understand how the Ayurvedic and modern methods of dissection and preservation differ fromone another.

MATERIAL AND METHODS

All the literacy data was collected from available Samhita's like Shusutra Samhita and available granthas and text books, related websites have also been searched. Previous articles were alsoreferred.

REVIEW OF LITERATURE

It is essential to preserve and dissect the dead body in order to keep the dead body for a longer period of time since there is no damage or injury to the body and easily seen structures are must tobecome best physician and surgeon.

In the fifth chapter of the Sushruta Samhita, Acharya Sushruta discussed the preservation of decad bodies. Modern preservation techniques are substantially different from Ayurvedic ones.

Types of preservation

1) Jal-Nijaamanakoth (Purification) Vidhi3: Preservation of cadaver by hydration in the river in a running stream where the current is not very strong and where there would be no interference from the public. The body should be steeped and allowed to decomposefor seven days.
2) Natural preservation: Preservation of cadaver by dehydration with hot sand.
3) Mummification: A more enduring preservation of the dead body, and involves the drying-out of thecadaver.

General introduction of the body Parts and Position

The human body is divided down into the head, neck, trunk, and limbs for descriptive reasons. The abdomen and chest, also known as the thorax and trunk, respectively. The pelvis and the abdomen proper are further divisions of the abdomen. By dissecting the body region

by region, the learner gains first-hand understanding of the relative placements of the many structures therein. He needs a basic understanding of the types of structures he will meet and an anatomical vocabulary that is enough to specify precisely the appropriate placements of these structures**.**

Selection of cadaver

For the selection of cadaver for the dissection purpose the cadaver should have :-

- All the body parts present,
- Not died by chronic illness
- Not died by poisoning
- Haven't reached hundred years of age.

The embalming process involve

1. Purva Karma 2. Pradhan Karma 3. Paschata Karma

1. Purva karma (Pre-Procedure)[4]

This step comprises choosing which body should be maintained and which should not.

Securing a dead body

The following things should be checked when securing a dead body

- That all the limbs are intact.
- That the death wasn't caused by poison.
- That the diseased hadn't endured a protracted illness.
- That the cadaver wasn't of an elderly person.

2. Pradhan karma is the main procedure (Procedure forpreservation)

- After removing the intestines and the faeces, place the body in a sturdy cage covered with mattresses or fibres of kusha, flax, or similar material.
- The cage is subsequently submerged in a flowing stream with a moderate current that is free ofhuman intervention.

3. Paschata karma which is the post-procedure

- For seven days, the body should be left to rot in this water.
- Starting with the skin, it should be removed once every component is free.
- With a brush made of bamboo bark or a similar material, each organ should be examined andpulled out.

- Then, each internal and exterior portion and organ should be closely scrutinised and researched.

Dead body preservation in cold water

The presence of dissolved materials in the water may have a "preservative" effect. Extremely cold rivers like the Himalaya and Jammu Kashmir rivers may be the best for preservation, especially if the water contains dissolved materials. Preservation[5] required a certain amount of water flow, and the riverbed needed to be sandy rather than muddy. Only the Himalayan rivers and a few from Karnataka and Kerala may be utilised for preservation according to Acharya Sushruta's description. Rivers are colder during the winter that help to stop further decomposition. The cadaver is kept sterile mostly by the mechanical washing action of the river water. Himalayan rivers have clean water as good as sterile and contains less no. of bacteria.

Preservation technique as per acharya sushruta

The removal of the GIT and the adnexa shows that the surgeon was aware that the body would quickly putrefy if these were left in the cadaver. Understanding of "Antras" (Intestines), "Amashayas" (Stomach), and "Pakwashaya" (Large intestine) was initially attained, after which the other components received focus. Bacteria in the caecum cause lividity, which spreads to every area of the body.

Following the body's collection, it is wrapped with Kusha or Darbha (Desmotachya bipinnata) and Munja (Saccharum munja). Recent studies have demonstrated that they serve as preservatives. The entire body's covering will stop the body from decomposing. The bundled grass is taken off and dissected as needed for the dissection.

1. The cadaver is enclosed in a cage to keep wild animals away. Delaying the decay by encasing it in grass layers can also be beneficial. The instruments were made of wood or bamboo.
2. A bird’s eye view of the possible dissection site at the time of Ayurveda. The place is lonely, away from the human disturbances and interferences, clean, calm and quiet with plenty of water for the cadaver as well as from the students to bath and clean themselves.
3. Natural canals and natural deviated water streams were selected.
4. Method of placing the cadaver in a bamboo cage in supine position wrapped with Munja and Kusha (Darbha grass) and fixing the same in running water stream.
5. The stones are used for weights to fix and to immerse the cadaver completely underwater.

All theparts are fully dipped in water and no part is left exposed to air.

Modern preservation technique

Introduction: Cadavers are a tribute to body science, and medical students frequently use them to study anatomy. They are also frequently used to test surgical techniques on cadavers before using them on living patients. Many schools favour alternative teaching methods that incorporate technology and surgical models for their students. Cadavers[6] are still required for practical instruction. The study of the visible bodily structures in gross anatomy, a standard course in medical school, allows students the chance to learn via doing. Additionally, the demand for cadavers has increased outside of university research programmes.

Over the past 200 years, corpse preservation techniques have evolved. At the time, there were no suitable ways to prevent the corpse from rapidly decomposing, therefore cadavers had to be utilisedright away.

In order to provide classes and lessons about the human body, preservation was required. Althoughit causes yellow stains in the tissue, glutaraldehyde was the first major chemical used for embalming and preserving the corpse. These stains might make it difficult to see and conduct study. The chemical that is currently the primary embalming chemical is formaldehyde. It is a colourless solution that keeps the tissue having a realistic texture and may effectively preserve the body for a long time.

Modern embalming techniques

1. **Arterial embalming:** In most cases, the common carotid artery is used to inject embalming agents into the blood vessels. This solution removes blood and interstitial fluids.
2. **Hypodermic embalming:** Using a hypodermic needle and syringe to inject embalming chemicals into tissue, or hypodermic embalming[7], is a further technique that is often employed as needed and case-by-case to treat places where arterial fluid has not been evenly dispersed.
3. **Surface embalming:** Another additional technique is surface embalming, which is used to maintain and repair damaged portions as well as sections of the skin that are immediately on the surface.
4. **Cavity embalming:** This is the process of using an aspirator and trocar to remove interior bodily fluids and replacing them with chemicals used in embalming.

Preservation material	
Name of Preservative Fluid and Instruments	**Quantity**
1. Carbolic acid or Phenol	1lt.
2. Formaline	4lt.
3. Glycerine	2lt.
4. Spirit	3lt.
5. Terpentine oil	300ml
6. Water	3lt.
7. Staining fluid	------
8. Red lead	200mg.
9. Water	2lt.
10. Pot	1
11. Canula Thared	1
12. Surgical blade	1
13. Scalpel	1

Purpose of preservation

To protect and preserve the body for a longer period of time and to make it easier to see structures,according to contemporary standards.

1. Acquiring the practical knowledge of anatomy (Medicine& Surgery)

A surgeon who wants to learn about the body must dissect a dead body and examine every structure and organ, according to Acharya Sushruta.[8]

Both what is really seen and observed during dissection and what is learned conceptuallyfrom anatomy textbooks should be complementary. Both approaches promote the expansion of real knowledge. No matter the field of study—anatomy, for example— knowledge gained from the study of Shastras (Literature) cannot make a man faultless unlessit is combined with personal observations. After overcoming personal challenges, one should practise medicine—both theoretically and practically.

2. Religion and Beliefs

The ancient Egyptians were one of the societies that thought that life continued in the body after death. Other societies often nourished and dressed their deceased, worshipped themlike deities, and occasionally even took their troubles to them. While many prehistoric cultures shrank their skulls as a form of warfare, particularly the Jivaro Indians. It was a widespread notion that a warrior's fortune would be enhanced by owning a shrunken head.

3. Sanitation

In order to overcome the issue of burying their dead in a valley that regularly flooded and to prevent filthy circumstances brought on by corpses mingling with drinking water and spreading illnesses, Egypt also performed embalming.

4. Knowledge

People have always been fascinated by the human body's secrets. Human bodies might be studied by doctors without being purified thanks to the invention of preservation techniques and chemicals.

Thus, it became feasible to prolong the "lives" of the deceased. The most recent preservation method, called plastication, was created by Prof. Von Hagens and permits the preservation of the human body in its original shape and colour.

5. Public awareness

Viewing of preserved human body specimens is a far more effective way to spread health awareness information than numerous diagrams and pictures. For instance, a blackened lung would discourage someone from smoking, cirrhotic liver would discourage someone from drinking. The following findings were acquired from a series of surveys conducted on visitors to the Body Worlds exhibition in New York. In the future, 59% of the visitors will pay greater attention to their health, including 10% who have vowed never to smoke again after viewing tar-coated lungs. 36% of individuals who had never before taken part in the organ donation programme said they would now.

Dissection according to ayurveda

The Cadaver Should Be Taken Out of The Cage After Allowing It To Properly Decompose For Roughly Seven Nights. It Should Then Be Carefully Dissected Layer By Layer Using A Scraper. Any Combinationof Uuira, Bala (Hair), and Vegu Brushes Valkala and (Bamboo). In This Manner, Following Skin Removal.

The Maximum Number of Exterior and Interior Components, Along With Their Subunits, Should Be Visually Inspected. Following An Explanation of The Dissection Method, Acarya Sushruta Emphasized The Significance of Dissection, Saying The Individual Who Wants To Become A Surgeon ShouldCarefully Examine Each of The Cadaver's Organ.

Dissection of skin layers

During the first 7 days of the dissection there was full separation of all seven layers of the skin. Theskin came off with ease as time proceeded. The deep fascia and muscles perhaps got separated In the next 7 days or so and in the remaining fortnight the ligaments of the various joints separated.

Instrument

The different organs might be pushed, pulled, teased, or separated using the naturally occurring instruments. The dirt or particles were blown away using the hollow horns and bones. They were occasionally employed as measurements and for sucking fluids that interfered with the site.

Timeframe for dissection

The process of dissection might take up to a month. According to the Hindu calendar, November, December, and January are the best months, which correspond to Kartik, Margasheeersha, Pusha and Meegha. One week of decomposition in air is similar to two weeks in water, which is equivalentto eight weeks in the earth.

Modern dissection technique

The body[3] is made up of several organs that are deeply immersed in fascia, a matrix of fibrous connective tissue that ranges in density from a loose mesh to tough sheets or bundles of fibres. Byseparating the organs from this tissue and displaying the changes in their density, dissection is the procedure. The ideal method for doing this is blunt dissection, which involves ripping through the loose layers of connective tissue with a hook or forceps. By reserving the knife for the skin and the thick layers of deep fascia that surround and partially cover many organs, it is feasible to release organs in this way without harming blood arteries or nerves.

Skin removal: One technique involves removing the skin in a series of replaceable flaps from the superficial fascia to prevent drying of the portion. It is usually preferable to use blunt dissection to cut through the skin and superficial fascia and separate them both from the underlying deep fascia in one layer. This method makes it simple to locate and follow the blood vessels and nerves that reach the superficial fascia via the deep fascia. Searching for their little branches in the superficial fascia is an exhausting and frequently fruitless option. The learner should be aware that,aside from the bigger branches that are simple to follow, the

distribution of cutaneous nerves is of significant clinical value, although it is best learned by reference to diagrams. A little artery and one or more tiny veins nearly invariably accompany the nerves in the superficial fascia. Additionally, there are larger veins in the superficial fascia. To breach the deep fascia and drain into the deep veins, they follow a single path. These superficial veins have valves at these intersections that stop blood from the deep veins from refluxing.

Deep dissection: Start by uncovering and examining the deep fascia before removing it. It sends sheets between the several muscles, confining each in its own tunnel, making this more challenging. When several muscles develop at the same time, the walls of these tunnels also give birth to muscle fibres, resulting in the formation of a tendinous sheet that seems to link together the adjacent muscles. In other places, it is quite simple to remove muscles' deep fascia since only thin strands can travel between the various bundles of muscle fibres. The tasks of a muscle can only be ascertained in this way, hence it is crucial to track each muscle to its attachments and precisely identify these. Look for the neurovascular bundle entering each muscle as it is revealed and raised from its bed. Retrace the neurovascular bundle's structures to the primary nerve trunk and originating arteries. Once they have been located, it is quite simple to use blunt dissection to follow them and identify their further branches. The arteries are frequently accompanied by tributaries of the main vein, which might make it difficult to see the artery and nerve. The veins should typically be cut out in these situations so that the other structures may be seen more clearly.

DISCUSSION

Old writings contain a wealth of information about the preservation and dissection of dead bodies. Susruta talks about the scientific approach to dissection and preservation. Susrata advises placing a dead body first in slow-moving river water if you wish to preserve it. Susruta recommended keeping a dead body with all of the body parts so that one may learn about the entire body. If a chronic condition causes mortality, the body's internal or exterior components may change.

Sushruta also advises against keeping bodies that have died as a result of poisoning because there is a potential that the poison may cause the tissues to decompose.

Therefore, it is important to maintain a body that has died naturally.

After a dead person has been preserved for seven days, according to Sushruta, the dissection of thebody begins with the aid of kusha, khasha, and bark.

Additionally, Sushruta advises against using sharp instruments for dissection. According to him,dissection of the bark and kusha khasha can be used to gain detailed knowledge.

CONCLUSION

Dissection requires the dead body to be preserved. Modern science and Ayurveda both provided distinct explanations of preservation. The Ayurvedic technique of preservation is straightforward and organic. The Ayurvedic technique of preservation uses no chemicals, whereas the current approach uses several chemical agents. These chemical substances might have a negative impact on the deceased body's decomposition. Thus, after reading this assessment, we can conclude that the Ayurvedic way of preservation is natural and secure. It is also easy and inexpensive, but it still hascertain drawbacks.

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