

EMBALMING AN AYURVEDIC PERSPECTIVE: A REVIEW

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ABSTRACT

The name Embalming had been gained because of the use of balms and balsams to impregnate the dead body for preservation. Embalming is an Art and Science of preserving human or animal remains by treating them (in its modern form with chemicals) to forestall decomposition. *Acharya Sushruta* had explained Dissection and Dead body Preservation methods in *Sushrut Sharir Sthana*. *Charakacharya* had stated that the knowledge of *Sthul* and *Sukshma Sharir* is necessary for understanding of *Rachana sharir*. Hence, to give the cadaver a good ante mortem appearance not only generate interest for dissection but also helps to recognize the structures, its course and variation which are encountered during dissection. This can only be achieved if cadavers were embalmed properly. The main purpose of this article is to provide a brief knowledge about various processes of preserving cadaver, health hazards of the preserving chemicals and natural methods of dead body preservation.

Keywords: Embalming, *Ayurveda*, Cadaver Preservation, Putrefaction.

INTRODUCTION

According to *Acharya Sushrut*, knowledge gained practically and whatever is known from the scripture that together enhance the knowledge further¹. Embalming is the Process of chemically treating a cadaver to reduce the presence and growth of micro-organism, to retard organic decomposition and to restore acceptable physical appearance². Cadaver is the main tool for teaching gross anatomy by Anatomist and other medical educators. People have practiced human Preservation methods and restoration art since early time for various purposes like religion, belief, royalty, tribal warfare, revenge and knowledge³. For better Practical (Dissection) understanding it is essential to restore a normal ante mortem appearance of the

cadaver, for the same reason *Acharya Sushruta* had introduced '*Mritsamshodhan Paddhati*' in our ancient classics. Now a days Formalin is the prime constituent of chemical embalming fluid used for cadaver preservation. But it has several drawbacks and health hazards also. Several NCI(National Cancer Institute) surveys of Professionals who are exposed to Formaldehyde in their works, such as anatomist and embalmers, have suggested that these individuals are at an increased risk of Leukaemia and Brain cancer compared to general population⁴. Hence it is need of hour to minimize the health hazards of formalin or to find out its alternative having minimal or no health hazards to the

workers such as anatomist and embalmer in contact with this chemical.

Aim and Objectives

1. To highlight the knowledge of cadaver preservation according to Modern and *Ayurveda*.
2. To know about the health hazards of modern (Chemical) method of cadaver preservation.
3. To explore *Ayurveda* as natural and safe method of Cadaver Preservation.
4. To review in detail Modern and *Ayurvedic* techniques of Embalming.

Review of Literature

Acharya Susruta had described dead body preservation method in 5th chapter of *Sushruta Samhita Sharirsthana*. *Sushrutacharya* had described about the scientific method of cadaver preservation and dissection. According to him if someone wants to preserve a cadaver then firstly place it in slow flowing river water. He advised to preserve dead body with all body parts so that one can learn about whole body. He also mentioned that not to preserve dead body whose death occurs due to poisoning because, there may be chances of decomposition of cells or tissues due to poison of dead body. Thus, one should preserve the cadaver only if the death occurs in natural way.

Dead Body Selection According to Sushrut Acharya

According to *Acharya Sushrut*, following points should be taken into consideration for the selection of dead body⁵-

1. A dead body should have all its parts existed or intacted.
2. Death should not be due to poisoning.
3. Not dead due to chronic disease.
4. Not of hundred years of age obtained.
5. Faecal material present in the intestine should be removed.

Preservation of Dead Body

Sushrutacharya described that after the selection of the dead body, it is wrapped either with *Munja* grass, *Valkala* (bark of tree), *Kusha* grass, *Shana* (cannabis plant) or any other such material, then tied well and placed inside a cage which is kept in a slow run-

ning/flowing water of river at a lonely place and allowed to undergo putrefaction⁶.

Historical Background of Embalming

1. During *Vedic* period, there is a reference regarding preservation of dead body of king *Dasharatha* in *Tail droni*⁷.
2. The old-world culture that had developed embalming to the greatest extent was that of ancient Egypt probably before 4000 BC and was used by them for more than 30 centuries. They were Egyptians who developed the process of Mummification⁸
3. When Abraham Lincoln's body was embalmed, the embalmer preserved it for the long term. At the turn of the century it was disinterred for forensic study, revealing a perfectly preserved corpse.⁹
4. The first man to embalm by injecting a prepared preservative chemical solution into the blood vessels is believed to be the Dutch anatomist Fredrik Ruysch, but his technique is unknown.
5. Leonardo DaVinci (1452-1519) produced hundreds of anatomical plates as a result of his dissection of the human body. He undoubtedly used arterial injection to preserve his specimens, his embalming fluids were mixtures made from turpentine, camphor, oil of lavender, vermilion, wine, rosin, sodium nitrate and potassium nitrate
6. Dr. Frederick Ruysch (1665-1717) is generally considered the father of embalming with his discovery of the first successful system of arterial embalming.
7. In 1867, the German chemist August Wilhelm von Hofmann discovered Formaldehyde, whose preservative properties were soon discovered, and which became the foundation for modern methods of embalming.
8. In the 19th and early 20th centuries Arsenic was used frequently as an embalming fluid but has since been substituted by other more effective and less toxic chemicals. It was also because of legal concerns as people suspected of murder by Arsenic poisoning could claim that the levels of poison in the deceased body were a result of embalming postmortem rather than evidence of homicide¹⁰.

9. Babylonians, Persians, and Syrians preserved their dead body by placing them in jars of honey or wax¹¹.

Embalming Chemicals and Their Properties

The chemical constituents (Materials) of embalming fluid used in modern embalming are variety of disinfecting agents, sterilizing agents, perfuming agent, various dyes, modifying agents (anticoagulants and buffer) and preservatives. Embalming fluids provide a good preservation of organs and tissues together with retention of natural colour of organs. They also prevent the bacterial or fungal growth. Formaldehyde is bactericidal, insecticidal, fungicidal and an excellent tissue fixative. So, it is the prime chemical of choice for preservation of dead body. Sodium borate, as preserving agent works as insecticide and mild antiseptic. Phenol work against various bacteria, fungi and viruses due to its ability to precipitate and denature proteins. Buffers act as pH balancing agents. It also affords protection against mild growth and bacterial decomposition. Cell Conditioner act to prepare cells for absorption of arterial fluid and helps break-up blood clots. Humectants are added to dehydrated and emaciated bodies to help restore organs and tissue to a natural and hydrated appearance. The chemicals that are used in embalming will repel most insects and slow the process of putrefaction but will not serve a corpse indefinitely. In a sufficiently dry environment, an embalmed body may end up mummified¹².

Health Hazards of Embalming and Its Chemical

Johns Hopkins researchers have reported the first known case of Tuberculosis (TB) transmitted from a cadaver to an embalmer¹³. Infectious HIV has been reported in the pleural fluid, pericardial fluid and blood of such patients after storage at 2 °C for upto 16.5 days post mortem¹⁴. There is also reported case of HIV recovered from bone fragments, bone marrow, spleen, and lymph nodes from a patient with AIDS at autopsy six days after death¹⁵. An occupational HIV infection in a nurse who was pricked by a needle that had been used on a drug addict has been reported¹⁶. Several NCI(National Cancer Institute) surveys of Professionals who are exposed to Formaldehyde in their works, such as anatomist and embalmers, have

suggested that these individuals are at an increased risk of Leukaemia and Brain cancer compared to general population¹⁷.

Herbal Drug as Embalmer

As we have seen that the Chemicals present in modern embalming fluid are having Antibacterial, Antifungal, Anti putrefactive, Antimicrobial, Anti-inflammatory, Antifungal, Antiseptic and Blood clot dissolving Properties. Similarly, according to *Charakacharya* (in *Aatreyabhadrakapiya Adhyaya*) *Katu* and *Tikta Ras-Dravya* are having *Putihar* (Anti putrefactive), *Jantuhar* (Antimicrobial), *Shonit sanghat Bhinnati* (Blood clot dissolving) Properties¹⁸. *Katu-Tikta ras dravya* are also having Antibacterial, Anti-inflammatory, Antifungal, Antioxidant Properties as found in various researches. Thus, we can say that as a research hypothesis herbal drugs could be used as alternative to conventional Chemicals of Embalming fluid after Conducting Various Scientific Experiments/Researches.

DISCUSSION

Acharya Sushrut had described the process of preservation of human dead body in very good sequence. While selecting a cadaver for preservation, the criteria mentioned by *Sushruta* was very important. The dead body which is devoid of any of its part does not furnish correct and complete information. If death occurs by any chronic disease or by poisoning, the organs would have become emaciated, losing their normal qualities like size, texture, shape and appearance. If death occurs by old age (above hundred years) many organs would have become shrunk in size and lost their qualities, appearance of wrinkles on the skin, falling of teeth and hair, osteoporotic changes in bones, dryness of skin and many such changes which are mistaken as normal. Both modern embalming chemicals and herbal embalmer drugs are having Antibacterial, Antifungal, Anti putrefactive, Antimicrobial, Anti-inflammatory, Antifungal, Antiseptic and Blood clot dissolving Properties. Only difference is that Chemical embalming Constituents are having Benefits with health hazards while herbal drugs are natural and safe.

CONCLUSION

Most of the facts of modern embalming are same, as described by *Sushrutacharya* but technique used is different and advanced. *Sushrutacharya* had used natural materials for preservation, while modern science has used various chemicals. The purposes of both Preservation methods are same that are to forestall decomposition and maintained the life like appearance of the cadaver. *Ayurvedic* method is simple, natural cost effective with no health hazards to Anatomist or Embalmer.

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Source of Support: Nil

Conflict of Interest: None Declared

How to cite this URL: Deepak K. Dobade et al: Embalming An Ayurvedic Perspective: A Review. *International Ayurvedic Medical Journal* {online} 2019 {cited December, 2019} Available from: http://www.iamj.in/posts/images/upload/2246_2249.pdf