



RESEARCH ARTICLE

IMPORTANCE OF CADAVER-DISSECTION IN MEDICAL COLLEGE (BASE OF ANATOMY)- TO BECAME A DOCTOR

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INTRODUCTION

A cadaver also called corpse (singular) in medical literary and legal usage or when intended for dissection is a deceased body (Bay Noel Si, 2010). Importance of cadaver –Cadavers used to verify surgical techniques before moving on to living patients (Roach Mary, 2003; Stranding, 2008). After death of a human purification start about 36 hours after death in winter and after 6-12 hours in summer season. Before starting putrefication we use dead body for preservation or making cadaver. First sign of putrefication is seen at right iliac fossa (a greenish discoloration). If putrefication have start then we reject body for preservation and buried this body in a dump pit. In summer season after death if body is put on ice or body kept in cold storage (body cooler) then it has no sign of putrefication upto 2-3 days and it can use for making cadaver. Some time dead body come after accidental injury or after postmortem (means there is no intact body or missing a part of body). In this case we no use dead body for making cadaver.

Dead body unfit for cadaveric purpose

- Dead body of a child

ABSTRACT

Introduction: After PMT selection when a student enter in medical college, Then he/she first time introduce with cadaver. Cadaver is a term used for chemically preserved human dead body which are used for learning internal structure of human body. On cadaver student done dissection under observation of Anatomist which is very necessary for medical student for gaining knowledge of human body. **Aim:** Dissection is very necessary for medical student. By knowing position of organ, muscle, joint structure they correlate symptom with pathology and make diagnosis, and they can prescribe medical treatment or surgical treatment. **Method:** Dead body is preserved by infuse preservative (formalin) in dead body tissue, this procedure is known as embalming. After embalming dead body put in forma line filled tank for preservation. After preservation dead body is termed as Cadaver. Dissection of cadaver done by surgical instrument and By proper guidelines according to textbook for dissection under the observation of faculty of anatomy department. medical student by dissection know exact position of blood vessels, nerve, muscle, G.I.T., Viscera, bones and joint. **Result:** By dissection they correlate site of pain and affected organ. They make surgical incision by knowledge that where is blood loss is minimal after cutting and where is healing well after suturing.

- Dead body of suicidal case.
- Dead body of suspected crime (murder /poisoning).
- Dead body of unnatural death.
- Dead body of HIV infected patient. A certificate must need that patient has no H.I.V. (As HIV virus can not destroyed by ordinary preservatives of Embalming.)

Dead body fit for cadaver

- Unclaimed dead body found anywhere.
- After filling Body donation form in living state of the Individual after Giving consent by his /her Relatives
- Death after long hospitalization as from charitable T.B. hospital. If upto 72 hours (3 days) no family members / relatives claim for that dead body for funeral.

Some time dead body come from T.B. Hospital only for preservation purpose(only for put in body cooler /cold storage), as at time of death there is no family members / relatives found near to patient. So in this condition we wait for 72 hours (3 days).

If any family members / relatives claim the dead body for incrimination then we handover dead body to the relative. If no family members / relatives claim dead body for incrimination then embalming done in this body. Even after embalming done and any family members / relatives claim dead body for incrimination then body hand over to relative or family members. If no one come after 3 days for body, dead body put in formalin filled storage tank after embalming for making cadaver. H.I.V. is superadded infection in tubercular patient. So always when death reason is tuberculosis, a certificate of No H.I.V. infection in that patient is must needed.

How to make a cadaver: First dead body unclothed, hair from skull, pubic region should be removed and embalming done. Embalming means infusion of preservative fluid by a fine bore needle.

Embalming

Techniques of embalming

Incision in body for embalming: Most common site is - femoral artery (in femoral triangle). Skin incision approximately 1.5 -2 inch long make at site of apex of femoral triangle (At junction of upper 1/3rd thigh, midway between pubic tubercle and anterior superior iliac spine). 2nd Most common site is - carotid artery in cervical region (neck).

Embalming fluid: Quantity - 15 liter

Main content - Aqua (water)

In this add - Preservative - 10 % Formaline

Antifungal - Thymol

Anti-infective - NaCl (common salt)

Moisturizing agent - Glycerine

Method of Embalming

- Gravity method - old method, slow (take more time)
- Pump method - Fast (take less time- approximately 30 minute)

Gravity method: In this method embalming fluid put in a bucket, which kept on at a height of 6 - 10 ft. A rubber tube is connect to bucket, by this tube, embalming fluid come, Another end of tube is connect with a infusion set / injection set, which is inserted in body (in artery). Due to gravity embalming fluid come automatically and go in whole body within 2 -3 hours. when embalming fluid pour out from external opening - nose / ear, we understood that now embalming is completed.

Pump method: Pressure applied by pump method, so whole embalming fluid within 30 minute go in all over body.

Cavity embalming: Also done (injecting fluid direct into thoracic and abdominal cavity; so formalin reaches deeper site in viscera. As most common site for flourishing bacteria is viscera). After embalming body kept in a formalin filled tank.

Reaction of medical student after seeing cadaver 1st time:

After passing P.M.T. (premedical test) when student come in medical college with a dream of to become a successful doctor, most student feel trouble with cadaver. Eye penetrating formalin, bad - Pungent odor, dark, dry skin of cadaver, they would not want touch cadaver. Approximately 5% student become faint /or feel vertigo after seeing cadavers. Before dissection painting of cadaver should be done by turpentine oil and glycerin. Pungent odor of cadaver is suppressed by turpentine oil. Glycerin is hygroscopic agent / moistening agent, so glycerin make cadaver skin soft so incision in skin made easier and skin easily separate from fascia with no window forming in skin. After some day when they attend theory classes of the Anatomy, they eager to know how a nerve, artery, muscle look. they keen to know interior of body, who create by God in a very systematic manner. All structure related with each other and make a muscle - skeletal frame work of human body who can stand on 2 feet, can move, can speak, can reproduce, can think. First time when student saw muscles of limb, he /she became very happy because till date he /she look muscle etc. only in diagram or pictures. After dissection he /she knew how muscle are attach with bone and one bone by another bone by a joint. Slowly - slowly student enjoy dissection and develop hobby of dissection of cadaver with seizer, scalpel, knife. Then they understood during surgery in a living patient, how he /she can manage incision to cutting skin with no harm to nerve or blood vessels (Zimmerman, 1993). When thoracic cavity cut and student saw heart, they surprised and become very -very happy because since childhood they heard a name Dil -means heart ; he /she heard about Heart - Attack, and they well known that by stopping function of heart we will die. he /she knew according to Hindu Dharmgranth -Geeta, soul lie in heart, but in anatomical dissection of a cadaver they never found where is place of soul. he only read that heart has power to start beating automatically and beat regularly by special tissue. And 1st time when they saw abdominal cavity -liver, kidney, G.I.T., pancreases, they become very happy and confident and satisfy, they thought In mind now they knew all about of human body because since childhood whenever he /she was go to the doctor for any sickness treatment, they watch that doctor put hand over abdomen and search exact site of pain /pathology.

Occupational hazard by cadaver

- Most common preservative in most medical college is formalin. Formalin is a potential carcinogenic agent. Medical student expose only 1 year to formalin but faculty of anatomy (which taught dissection to medical student) exposed to formalin repeatedly every years. So it is very dangerous to faculty of anatomy.
- Graying of hair also done earlier (before actual age of graying) due to exposure of formalin.
- Some time fungal infection occurred in cadaver, more common in skin of sole.
- Then most of student did not like remove skin of sole, only some student who is keen to know about structure of sole, remove skin and dissect sole.
- 4. During opening of G.I.T. fecal remnant also found, so it would be problematic to cut G.I.T. (specially rectum) and clean it to saw interior of G.I.T..
- most of time formalin don't go in deep tissue of lung and if death of that body (now a cadaver) done by tuberculosis ; then tubercle bacillus remain intact and

there is a chance of spread of infection. So a mask is applied during dissection of lung.

Drawback of cadaver

- Because of these reasons many students or Anatomy faculty don't like to do dissection although they well known importance of dissection. They want to learn anatomy or internal structure of human body by a man made dummy in place of cadaver.
- And also maintenance of cadaver is very expensive, Technicians needed for embalming. A formalin tank would maintain for keeping cadavers. Regular cleaning of tank is must, otherwise chance of fungal /bacterial infection in bacteria could occur.
- Workers need to put cadaver in formalin tank from dissection table after dissection and from Formalin tank to dissection table prior to dissection every day. Workers not preferred such a work (which is related to the cadaver) ; also money is paid for workers so again it become more expensive.
- Resources of cadaver are also limited. So many institute preferred man made dummy of cadaver in place of original cadaver.

Drawback of Dummy cadaver

- Natural /God created human body has very fine arrangement of internal structures. Dummy has no very fine branching of blood vessels / could not have fine nerve plexus arrangement.
- Variations in gross anatomy /morphology which find very commonly in population is never found in dummy. So medical student could not expose to variation, by which they always will expose when they treat patient as a doctors. At that time they can not understand anomaly found in that patient.

DISCUSSION

Importance of dissection since past: 'Mondino de Luzzi' put together a book called 'Anathomia' in 1316 that consisted of detailed dissections that he had performed. This book was used as a text book in universities for 250 years. 'Mundinus' carried out first systematic human dissections. The major development in anatomy occur in Christian Europe since the past where anatomists dissected cadavers and describe accurate description of organs and identification of their functions (Porter, 2013). Leonardo da Vinci⁷ (1452 -1519) was trained in anatomy by Andrea del Verrocchio. Leonardo dissection around thirty human specimens until he was forced to stop under order of pope Leo X.

In 1628 English Physician 'William Harvey' (Singer Charles, 1957) observed circulating blood through dissections of his father's and sister's bodies. He published 'De moto cordis et Sanguinis' a treatise. *Anatomical theatres* (Klestinec Cynthia, 2004) become a popular form for anatomical teaching in early 16th century. University of Padua was first and most widely known theatre founded in 1594. As a result, Italy became center for human dissection, People came from all over to watch as professors taught lectures on human physiology and anatomy. The study of anatomy flourished in 17th and 18th centuries.

At the beginning of 17 century use of dissecting human cadavers influenced anatomy leading to spike in study of anatomy before it dissection is a crime. Students were interest in technique of dissection rather than the philosophy of anatomy (criticism of professor such as Girolamo Fabrici). In 1752 rapid growth of medical school in England and pressing demand for cadavers led to passage of murder Act, This allowed Medical school in England to legally dissect bodies for anatomical education and research.

Body Snatching (Moore, Wendy, 2006): was act of snatching into graveyard, digging up a corpse and using it for study. The leading London Anatomist John Hunter paid for a regular supply of corpses for his anatomy school. During 17th and 18th centuries the dissections was a capital punishment. Dissections considered a dishonor. By the end of 18th century many countries allowed institutions to use unclaimed bodies of paupers, prison inmates and people in psychiatric and charitable hospitals for dissection. In 1794 according to law a rule made for medical colleges supplement bodies for anatomical lessons. Ultimately this create a opportunity for field of medicine to grow in direction of location of pathological anatomy. The development of appropriate diagnostic techniques and numerical approach to disease and therapeutics. The British Parliament passed The 'Anatomy Act 1832', which provided adequate and legitimate supply of corpses by allowing legal dissection.

'*Pathological anatomy*' give way for clinical pathology that applied the knowledge of opening up corpses and quantifying illness to treatment.

In late 18 century Thomas Pole published '*The Anatomic Instructor*' which describe how to dry and preserve specimens and soft tissue.

Conclusion

Cadaver is a real study material for Anatomy to know internal structure of Human Body. And exact Experimental practicing Material prior to surgery in living. Most important and basic pillar for surgery is cadaver. Cadaver is a great teacher itself for study and also a great teacher that taught a lesson that how we help other even after death. People who donate their body for Medical Institute for study purpose, really such a Great Person. So always feel love and regard to cadaver. Because since past we gain knowledge of internal structure of human body only by Cadaver.

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