Autopsy as a tool for learning gross anatomy during 1st year MBBS

Parmod Kumar Goyal, Monika Gupta¹, Jaswinder Kaur¹
Departments of Forensic Medicine and ¹Anatomy, Adesh Institute of Medical Sciences and Research, Bathinda, Punjab, India

ABSTRACT

Introduction: Embalmed cadavers are the primary tool for teaching anatomy. However, difficulties are encountered due to changed color/texture of organs, hardening of tissues, and smell of formaldehyde. To overcome these difficulties, dissections on a fresh human body were shown to the 1st year MBBS students, and their perception was noted. Materials and Methods: After taking universal precautionary measures, postmortem dissections were shown to students on voluntary donated bodies in the dissection hall, in addition to the traditional teaching on embalmed cadavers. Feedback was taken from students and faculty regarding the utility of these sessions. Results: Better appreciation of texture, orientation, location, and relations of organs in fresh body, integration of teaching, awareness of the process and laws related to body donations were the outcomes of the study. However, the smell and sight of blood was felt to be nauseating by some students, and some students were worried about the spread of infectious diseases. Conclusions: Visualizing single fresh body dissection during 1st year professional MBBS is recommended either on medicolegal autopsy or on voluntarily-donated bodies.

Key words: Anatomy learning, autopsy, embalmed cadavers, fresh body dissection

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INTRODUCTION

Autopsy is carried mainly to know the cause of death, which is a disease process or injuries or poisoning. Clinical/pathological autopsy is done on natural death cases at the request of relatives whereas forensic/medicolegal autopsy is done at the request of police on un-natural death cases. Second professional MBBS students visit mortuary to observe autopsies during forensic medicine posting. During one such visit, students expressed that if they could observe the same in the first professional, then their anatomy understanding could have enhanced.

Anatomy is traditionally taught in the 1st year by dissection of embalmed human cadavers.¹ However, students often experience difficulty in grasping the subject with embalmed bodies because of changed color and texture of organs, hardening of tissues, irritating smell of formaldehyde, and slow pace of dissection (spread over 8–10 months usually).²⁻³

Our institute being a private institute is not permitted to conduct medicolegal autopsies. However, we are permitted to observe autopsies at the government civil hospital. However, the civil hospital was situated at a distance of 15 km, and it was not feasible to take the 1st year MBBS students to civil hospital. However, voluntary body donation program was running successfully in our institute, and we were receiving excess of cadavers by voluntary donations.⁴

Address for correspondence: Dr. Parmod Kumar Goyal, Department of Forensic Medicine, Adesh Institute of Medical Sciences and Research, Bathinda, Punjab, India. E-mail: drparmodgowal@gmail.com

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Hence, a plan was made to teach anatomy to the 1st year MBBS students on voluntarily-donated fresh dead bodies.

Permission was taken from the Institutional Ethics Committee to carry out the study.

**Materials and Methods**

Autopsy/postmortem dissections on fresh un-embalmed voluntarily-donated human bodies were carried out in the dissection hall of Anatomy Department. After explaining the purpose of the study and taking verbal consent, 150 students of the 1st year MBBS batch, 2014, were divided into 5 batches of 30 each. Each batch of thirty students was shown postmortem dissections on a single body. Dissections were carried out by authors themselves after receiving the body in the Anatomy Department at the earliest. In cases of unavoidable delay, bodies were kept preserved in cooling cabinets of the Anatomy Department. Each dissection session lasted for around 40 min. Session was preceded by 20 min introductory talk on dissection steps and ended with 20 min free time for students to hold and feel the organs in their hands and to solve their queries. Only hospital death cases with hospital records clearly indicating negative HIV and hepatitis B/C tests were taken for the present study. All universal precautionary measures were taken to prevent the spread of any infection to faculty, students and dissection hall attendants. Students wore double-layered gloves while holding the organs. To cover 150 students, 5 bodies were dissected. All these dissections were in addition to the traditional teaching of anatomy on embalmed cadavers, which continued as such. Dissections were carried out from 10 am to 12 pm period, when students were already sitting in dissection hall as per their time table. During dissection, only the organs of chest, abdomen, and cranial cavities were shown. Feedback was taken from students and faculty from the Department of Anatomy.

**Results**

A total of 150 students witnessed a single case of fresh body dissection in the 1st year. Majority of the students (95%) reported better appreciation of texture, orientation, location and relations of organs in fresh body, better understanding of three-dimensional images due to visualization of structures of cranial cavity (brain and cranial nerves), chest cavity (heart and lungs), abdominal cavity (liver, spleen, kidneys, stomach, intestines, pancreas, etc.), and digestive and genito-urinary systems in near-real states in one go. In addition, students were eager to know the cause of death and observe pathological changes (e.g. adherence of lungs to chest cavity due to pleural inflammations, cardiomegaly, cardiac rupture, cardiac tamponade, ascites, hepatomegaly, splenomegaly, etc.). Students who assisted in dissection mentioned that it was easier to remove the skin, underlying fat and the underlying structures could be better appreciated as compared to embalmed bodies. Fresh body dissection was found to be free from the irritating smell of formalin and also created awareness among students of the process and laws related to body donations. Students were more enthusiastic in doing dissection and felt that watching autopsy was an interesting experience.

However, about 5% of the students felt that the sight and smell of blood was nauseating, but they got adapted to it soon. Some students were worried about the spread of infectious diseases from the dead body, although universal precautions were taken. For some students (2%), watching autopsy was a frightening and unpleasant experience, even one student fainted on watching the fresh blood.

Faculty from the Department of Anatomy were also not tuned to watching blood and dissections on fresh body. Initially, some of the faculty felt unpleasant, but like students, they were also excited to see the structures in a real state similar to what is seen in books. Faculty appreciated that some of the anatomical structures were better visualized in fresh body as compared to embalmed body.

**Discussion**

Students after watching autopsy dissections on fresh donated bodies could better understand pathophysiological mechanisms for organomegaly and other disease processes, as they could integrate the knowledge with physiology, pathology and also with clinical subjects. Better texture, orientation, location, and relations of organs helped to integrate the knowledge obtained with other subjects of the same year and upcoming years, which also satisfied internal desire of medical professional in the very 1st year. Although nauseating smell and fear of spread of infections were frightening for some, majority desired to watch it again. The present study could successfully be conducted because of excess of cadavers in our institute, due to successful voluntary body donation program being run in associations with nongovernmental organizations (NGOs) such as Dera Sacha Sauda, Sirsa, and Tarksheel Society, Punjab. Institutes facing shortage of cadavers can also run successful body donation programs by creating awareness among masses and associating with NGOs involved in voluntary body donations. Alternatively, students can watch such dissections on medicolegal autopsies conducted at government medical colleges. However, motivation on the part of faculty is required in this regard. In the present study, each student's response was noted after autopsy demonstration of a single case only, but students can be shown more such cases in association with the faculty of Forensic Medicine departments. Hubbell et al. have shown the advantage of teaching anatomy using...
living tissue. Kucuker et al.[7] highlighted the role of autopsy in medical practice. Stillman et al.[8] way back in 1978 mentioned about the use of live models in teaching gross anatomy. In our study, we have used fresh cadavers for teaching anatomy. In the same way, fresh cadavers can be used for training residents for surgical procedures.

**Conclusions**

Visualizing a single fresh body dissection enhances the learning of anatomy for the 1st year MBBS students. Medical colleges permitted for medicolegal autopsy may initiate the teaching of anatomy on bodies received for postmortems. It is recommended that the Medical Council of India should make it mandatory for the medical colleges to have functional postmortem unit in every medical college, irrespective of being private or government. In the meantime (in the absence of permission of autopsy to private medical colleges in most of the states of India), the visualization can be done on voluntarily‑donated bodies. Anatomy laws may also be amended to increase voluntary body donations.

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**Conflicts of interest**
There are no conflicts of interest.

**References**

1. Dyer GS, Thorndike ME. Quidne mortui vivos docent? The evolving purpose of human dissection in medical education. Acad Med 2000;75:969‑79.
2. Robinson AG, Metten S, Guiton G, Berok J. Using fresh tissue dissection to teach human anatomy in the clinical years. Acad Med 2004;79:711‑6.
3. McBride JM, Drake RL. Use of unembalmed/fresh cadavers in anatomy teaching. In: Chan JK, Pawlina W, editors. Teaching Anatomy – A Practical Guide. Switzerland: Springer; 2015. p. 223‑7.
4. Mann M. Cadavers: Medical Colleges Face Problem of Plenty. The Tribune: Bathinda; 20 October, 2011. Available from: http://www.tribuneindia.com/2011/20111021/battrib.htm#6. [Last accessed on 2015 Dec 13].
5. Goyal PK, Monika G. Study of the profile of cadavers donated to anatomy department of a private medical college of Punjab for medical research vis a vis body donation programme: A first hand experience of five years. J Res Med Educ Ethics 2011;1:176‑9.
6. Hubbell DS, Dwornik JJ, Alway SE, Eliason R, Norenberg RE. Teaching gross anatomy using living tissue. Clin Anat 2002;15:157‑9.
7. Kucuker H, Ozen OA, Songur A, Bas O, Demirel R. Should forensic autopsies be a source for medical education? A preliminary study. Teach Learn Med 2008;20:22‑5.
8. Stillman PL, Ruggill JS, Sabers DL. The use of live models in the teaching of gross anatomy. Med Educ 1978;12:114‑6.