

# Students' Perception on Dissection and Prosection in Learning Gross Anatomy

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## ABSTRACT

**Introduction:** Dissection is an integral part in learning Anatomy. The undergraduate students are allowed to dissect the cadaver and witness the structural details taught to them in the lectures. With the availability of many high quality specimens, simulating models, softwares for learning gross anatomy and also because of unfavourable students-cadaver ratio the question has evolved – Is there need to invest in a cadaver lab? Though the aforementioned resources are beneficial for learning anatomy, cadavers provide a 3D perspective not found with books or electronic media. With competency based medical education it is important for institutions to recognise student views and attitudes toward the learning method.

**Aim:** To evaluate the students' perception towards dissection and prosection in learning gross anatomy.

**Materials and Methods:** First year MBBS students of our college who were exposed to both dissection and prosection method of learning were given questionnaire containing statements A-J, pertaining to dissection and prosection. They were asked to grade the statements based on Likert scale. Median score for each statement was calculated. Students were also asked to give their view towards dissection and prosection. The results were tabulated and subjected to statistical analysis. Percentage of students opting for dissection and prosection were calculated.

**Results:** Majority of the students (65%) opined in favour of dissection, 5% opined in favour of prosection and 30% favoured both methods for learning gross anatomy.

**Conclusion:** This study reflects the student's attitude towards learning anatomy by dissecting cadavers than by prosection.

**Keywords:** Cadaver, Clinical practice, Structural details, Surgical skills

## INTRODUCTION

Dissection is a traditional mode of teaching structural details of human body to medical students. During first year of MBBS, students dissect the cadaver and observe the structures which were taught to them in the lecture class. The act of dissection, use of surgical instruments and knowledge of structural organisation of the human body initiate in them the process of transformation into future clinicians from mere learners [1]. Cadavers provide a 3D perspective of structures which is not found in books or electronic media [2-4].

Prosection is one of the alternative methods of teaching gross anatomy, where cadaver or a part of it is dissected by demonstrator or it is demonstrated by using pre dissected and well preserved specimens. So it enables the students to grasp the gross anatomy of the structures either by observing the on-going dissection or examining the already dissected specimens. With cadaver based lab curriculum even the medical colleges face many challenges like scarcity of cadavers, time availability for the course, space available for cadaver storage, number of students in the class, and cost for maintenance of cadaver lab [5]. Hence, the present study was undertaken to evaluate the students' perception towards dissection and prosection in learning gross anatomy.

## MATERIALS AND METHODS

A cross-sectional study was conducted during 2017 (September) -2018 (February) for the duration of six months, among 40 students of 1<sup>st</sup> year MBBS after obtaining informed consent from them. Among ten dissection tables two tables, "Table nine" and "Table one" were randomly selected for the study. Twenty students of table nine were taught upper limb and thorax by prosection method, whereas abdomen and pelvis was taught to them by dissection method. Twenty students of table one, were taught upper limb and thorax by dissection method, whereas abdomen and pelvis was taught to them by prosection method. In both the tables the

students were exposed to both dissection and prosection methods of learning.

In dissection method, students were given instructions on how to dissect the region and were asked to follow the Cunningham's manual of practical anatomy (volume 1 and 2) for further queries [6,7]. Once dissection was done by them, dissected structures were demonstrated by the table teacher. In prosection method, the cadaver was dissected by the table teacher and students were asked to just observe the dissection. Once dissection was done by the table teacher, the dissected structures were demonstrated to the students and the pelvic structures were demonstrated using pre dissected specimen.

Feedback was taken about the method of learning by using a structured questionnaire [5,8,9]. Students were asked to grade the listed statements (A-J shown in [Table/Fig-1]) using five point Likert scale (Response 1 implies strongly disagree, 2-disagree, 3-not sure, 4-agree, and 5-strongly agree) [10]. An open ended question was also included in the questionnaire asking the students whether they prefer dissection or prosection and were also asked to enumerate the reasons for their preference.

## STATISTICAL ANALYSIS

The grading was tabulated and "Median" was calculated for each statement of the questionnaire. Median score >3 (4-agree and 5-strongly agree) for a statement implies that the students are in agreement with the statements favouring prosection, since the statements are framed positively towards prosection. While median score <3 (2-disagree and 1-strongly disagree) implies that the students are in disagreement with the statements favouring dissection method of learning. Median score 3 indicates neutral, for both dissection and prosection. Data obtained was subjected to thematic analyses and focus group discussion was done with ten volunteer students for triangulation of the data.

	Statements
A	Knowledge gained from prosection is more compared to dissection
B	Time management is good with prosection compared to dissection
C	Interest generated towards subject is more with prosection compared to dissection
D	With prosection there is more scope for application of knowledge in future than with dissection
E	Prosection helps more than dissection to reinforce and apply concepts learned from lectures
F	With prosection, there is better understanding of spatial orientation of body than with dissection
G	Everyone gets equal opportunity for participation in prosection
H	With prosection, systems interrelation in the body is better understood
I	Prosection provides greater insight into anatomical variations than dissection
J	Structural details better witnessed with prosection than with dissection

[Table/Fig-1]: Statements A-J present in the questionnaire.

### RESULTS

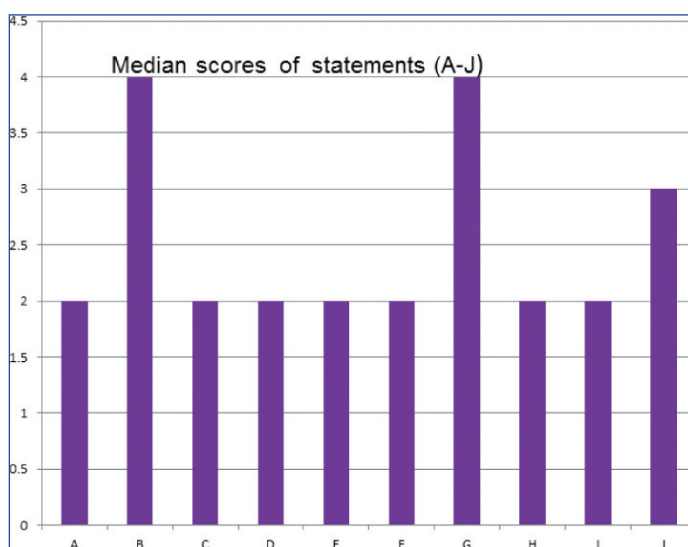
Majority of the students about 65% (n =26) opined in favour of dissection based learning, 30% (n=12) favoured both dissection and prosection and only 5% (n=2) opined in favour of learning gross anatomy by prosection. Benefits stated by the students for their preference of learning by dissection are-the touch and feel of cadaver in dissection evokes more curiosity, art of dissection helps them to acquire the surgical skills in future and mistakes made while dissecting helped them to avoid the same in future dissections (37.5%). Challenges enumerated by the students while dissecting are: lack of thorough knowledge (26%), time management (26%) and limitation of participation (17%).

In the questionnaire, only for the statements B (time management is good), G (opportunity for equal participation), the median scores were high (>3) – favouring prosection method. For the rest of the statements except J (structural details better witnessed) the median scores were low (<3)-favouring dissection method and for statement J the median score is 3, neutral for both dissection and prosection [Table/Fig-2]. The frequency and percentage of students responded to each statement is shown in [Table/Fig-3].

### DISCUSSION

Anatomy is one of the corner stones in medical education. Students can witness structural details taught in anatomy lecture class either by dissecting cadavers or by observing the pre dissected cadavers or specimen. In many colleges the students' cadaver ratio is decreasing owing to the decreased availability of cadavers for study purpose. This has led the anatomists to search for alternate methods and hence making them to switch on to other modalities of teaching like prosection, video based demonstration, simulators [4]. Though prosected specimens aid in reducing anxiety among students and used as an alternative method to dissection, studies have shown that students learning from prosected specimens is not more effective when compared to dissection method [5]. Even in our study for the statement “A” (Knowledge gained from prosection is more compared to dissection) students have favoured dissection than prosection.

Dissection mainly helps the students to understand the relations between the anatomical structures in depth and to apply it clinically. The dissection hall is a place where the future clinicians acquire basic



[Table/Fig-2]: Showing median scores of statement A-J of the questionnaire.

Statements	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)
A Knowledge gained from prosection is more compared to dissection	2 (5)	10 (25)	6 (15)	15 (37.5)	7 (17.5)
B Time management is good with prosection compared to dissection	6 (15)	22 (55)	6 (15)	5 (12.5)	1 (2.5)
C Interest generated towards subject is more with prosection compared to dissection	0 (0)	0 (0)	6 (15)	20 (50)	14 (35)
D With prosection there is more scope for application of knowledge in future than with dissection	4 (10)	11 (27.5)	3 (7.5)	20 (50)	2 (5)
E Prosection helps more than dissection to reinforce and apply concepts learned from lectures	3 (15)	10 (25)	4 (10)	17 (42.5)	6 (12.5)
F With prosection, there is better understanding of spatial orientation of body than with dissection	0 (0)	8 (20)	4 (10)	21 (52.5)	7 (17.5)
G Everyone gets equal opportunity for participation in prosection	7 (17.5)	19 (47.5)	10 (25)	3 (7.5)	1 (2.5)
H With prosection, systems interrelation in the body is better understood	0 (0)	9 (22.5)	9 (22.5)	16 (40)	6 (15)
I Prosection provides greater insight into anatomical variations than dissection	1 (2.5)	13 (32.5)	6 (15)	17 (42.5)	3 (7.5)
J Structural details better witnessed with prosection than with dissection	5 (12.5)	13 (32.5)	8 (20)	12 (30)	2 (5)

[Table/Fig-3]: Showing frequencies and percentage of students rating to components depicted in methodology.

surgical skills and conceive the mind of future clinicians [8]. In our study too for statements "D" (With prosection there is more scope for application of knowledge in future than with dissection) 50% of students and for statement "F" (With prosection, there is better understanding of spatial orientation of body than with dissection), 52.5% of students have disagreed and opined in favour of dissection.

Prosected specimens are often used to demonstrate challenging dissections and also when there are inadequate cadavers to dissect. It is difficult and time consuming even for a skilled prosector to prepare excellent quality specimens. Unless and otherwise the prosected specimens are managed under ideal conditions their longevity decreases [8].

In all branches of medicine it is only when the thorough anatomical knowledge combined with physical diagnosis can give better understanding of the disease. As revised medical curriculum in our country has reduced the time availability and staff requirement for preclinical subjects, time in the dissection hall should be used meticulously [9]. Our results depict that time management is better with prosection, since prosection cuts down the act of dissection and only few staff can cater to many students with prosected specimen (statement B).

As medical courses begin with dissection, majority of doctors remember the structural details encountered through hands on experience of dissection than other modes of learning and also the act of dissection facilitates them to acquire surgical skills for future practice to some extent, most of the students (52.5%) have agreed the same – statement E [11]. Apart from knowledge rendering, dissection hall is an ideal place to inculcate in the future doctors the very much needed professionalism, humanities etc., by cadaveric oath [12].

Decreased use of traditional dissection can result in reduced anatomical knowledge, not only for undergraduate students but also for clinical postgraduate students whose specialities demand the essential knowledge of surgical anatomy [13,14]. In the long run this can compromise in the process of disease understanding and patient safety [15]. Hence dissection remains the most efficient mode of delivering fundamental, regional, relational, and topographical anatomical knowledge not only to medical students but also for dental students which is very vital to ensure safe and efficient clinical practice, in the present study also the same has been highlighted by the responses to statements H and I [16,17].

According to Chinese philosopher Confucius 'I hear and I forget. I see and I remember. I do and I understand' – the same holds good for dissection too [18].

Since only two or four students can dissect at a time and others can just observe, equal participation of students is limited during dissection (statement G). Although prosection is done by the teacher who throws more light on the topic (statement J), from the cumulative feedback of students it is evident that dissection provides an opportunity to explore the structural details of human body, which is not there in the rest of medical curriculum. By having hands on experience, dissection arouses more interest in the subject, curiosity to find the structures, and compare it with other tables, thus verifying for variations in the anatomical structures.

## LIMITATION

Limitations of the present study are that, more number of students could have been included in the study and our study is only based on students' feedback, further results could have been improved if a pre-test and post-test were included with each method of learning.

## CONCLUSION

It is time tested truth that dissection facilitates learning of 3-Dimensional organisation of gross anatomical structures, which is very much needed for safe and efficient future clinical practice. The results of our study also highlight the same as 65% of students have opted for dissection and only 5% opted for prosection method of learning. Even in the digital era students have favoured dissection; since interest generated towards subject, understanding of spatial orientation of body, witnessing structural details, acquisition of basic skills are better with it than prosection method of learning.

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