Use of modern technology to make dissection easy: Innovative approach

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Abstract:

Introduction: With modifications in the time available for dissection during first MBBS course, students experience difficulty in dissection of head-neck-face (HNF) region. The main goal of this study was to develop an effective and innovative teaching module, to help students in understanding and performing HNF dissection in available limited time.

Methods: One cadaver was dissected step by step meticulously for (HNF) region following dissection manual by teachers. At each step of dissection photographs were taken. According to each day’s dissection schedule power point presentations (PPTs) were prepared using those photographs. At the beginning of dissection schedule, students were briefed about that day’s dissection with the help of PPTs in small group batches for 10mins.

Results: Briefing in dissection hall not only helped them to understand Cunningham’s instructions and steps to be followed during dissection but also saved their time and effort. Students had uniform understanding of all the structures to be identified during dissection of HNF. Students reflected positively about this new teaching module that now they are finding dissection more interesting than difficult.

Conclusions: Irrespective of condition of cadaver or skill of the dissector on each table in the dissection hall, all the students will have at least one visual impression of ideal dissection and uniform understanding of the structures due to briefing. In this module personal touch of teaching and interaction between faculty and students is maintained during briefing. Taking photographs of dissection and presenting in the form of PPTs is easy, convenient and economic.

Key words: Anatomy, Dissection, Briefing, Head-neck-face region, Technology

Introduction: The formal study of human anatomy, which means a disciplined dissection of the body, was initiated during 16th century. For first MBBS students learning anatomy of human body by dissection still has tremendous significance. In spite of reduction of teaching time for gross anatomy and modification of course content, importance of actual cadaveric dissection by group of students remains the same because dissection gives students a 3D view of human anatomy and reinforces knowledge acquired in lectures, tutorials and also develops self-directed learning and teamwork. Johnson EO [1] stated that no single method for teaching anatomy is able to provide supremacy over another. Jayanthi Venkatiah [2]
suggested that recent and current advances in both medical education and medical technology indicate the need for changes in approaches to teaching and learning anatomy. Learning aids incorporating photographs on computer can be used to teach anatomy in combination with traditional dissection methods.

Sugand K et al [3] noticed substantial problems which consist of diminished allotted dissection time and the number of qualified anatomy instructors, eventually deteriorating the quality of education. Alternative resources and strategies needs to be developed in an attempt to tackle these genuine concerns. The challenges are to reinstate more effective teaching and learning tools while maintaining the beneficial values of traditional dissection. At most of the medical colleges, in first MBBS students have to dissect human body part by part with the help of dissection manual. From students feedback we came to know that out of the whole dissection schedule, students experience more difficulty during head-neck-face (HNF) dissection. So at our department we thought of making it simple for students by taking briefing for HNF during dissection, a novel teaching module using photographs of steps wise dissection in the form of Power Point Presentation.

**Materials and Methods:** In advance, before starting HNF dissection schedule for students, one cadaver was dissected step by step meticulously by teacher. Right from marking of skin incision, taking incision, reflecting skin and deeper layers, at each step photographs were taken on a Canon 350 D digital camera. To show all the important structures mentioned in the dissector to the students, different photographs were taken for different structures by holding it in smooth forceps. Such series of photographs for each topic of dissection schedule were uploaded on a personal computer, were modified for better visualization with the help of windows picture manager and then using Corel Draw application, important structures in each photograph were labeled as shown in Photograph No 1, 2, 3&4. According to each day’s dissection schedule power point presentations were prepared using those photographs.

During dissection schedule in the beginning itself, students were briefed about that day’s dissection with the help of PPTs in small group batches for 10mins. How to perform scheduled dissection step by step and criteria to identify the important structures are the points stressed upon during briefing. After having visual impression about dissection, students dissect on their respective allotted cadaver and find out important structures. At the end of the HNF dissection schedule feedback from students regarding this new teaching module of dissection briefing was taken.

**Results:** The main goal of this study was to develop an innovative teaching module to help students in understanding and performing HNF dissection in available limited time. Briefing in dissection hall helped them to understand Cunningham’s instructions and steps to be followed during dissection. Students had uniform understanding of all the structures to be identified during dissection. During briefing due to small group, students could interact with faculty in case of any difficulty in understanding. Due to clear idea about how to dissect, what to look for and criteria to identify structures, quality of their dissection was improved as well as saved time.

In their feedback about this new teaching module, students reflected that now they are finding dissection
more interesting than difficult. Due to actual dissection photographs, they could find out and identify structures themselves and in turn it helped them understand gross anatomy topics better as well as boosted their confidence for soft part viva examination. They could remember relations of different structures due to visual impression.

**Discussion:** Computers can be a very convenient and effective format to display or communicate anatomical images. With the introduction of one year course for first MBBS, it has become important that for teaching Anatomy our traditional way of teaching must be modified. Modern technology should be used to give highly specific and relevant learning aids which can save time, still improve understanding of students.

Johnson EO [1] reviewed current thinking in medical education and presented their transition from a passive, didactic, highly detailed anatomy course of the past, to a more interactive, as well as functionally and clinically relevant anatomy curriculum over the course of a decade. In US and Canadian Medical schools, computers have been in use for teaching gross anatomy for more than 12 years.

Noelle a. granger et al [4] had introduced an online interactive anatomy program to enhance the dissection experience, observational learning in which dissection videos for each body region model were prepared along with recorded narration.

Tam MD et al [5] reviewed eight quantitative studies to know whether learning anatomy is facilitated by computer-aided learning which revealed favorability showing improvement in knowledge with the help of computer aided teaching learning modules.

In learning Anatomy, dissection plays significant role and this new teaching module of dissection briefing enables students to familiarize with necessary new terminologies in anatomy with its practical understanding. During briefing dissection instructions are given serially and in short simple steps with visual impression which prevents the students from getting confused or bored, still helps to understand tediously long paragraphs containing many factual details. In briefing the salient features of the parts to be identified during examination were highlighted which helped the students to perform better in part completion examination.

In this module there is personal touch of teaching and interaction between faculty and students. Taking photographs of dissection and presenting in the form of PPTs is easy, convenient and economic.

Use of modern technology is only a supplement to traditional time tested teaching and learning method. The importance of performing dissection by students and study of actual specimens is always there.

Turney BW [6] coated that integration of newer teaching modalities and modern technology will encourage interest and retention of anatomical knowledge and its clinical relevance.

**Conclusion:** Dissection has survived the most rigorous test of pedagogical fitness—the test of time. The student--cadaver--patient encounter is paramount in medical education. This innovative teaching module of “Dissection briefing”, for 10 minutes before each dissection schedule, in the form of PPT of photographs showing ideal dissection along with explanation of steps to be followed and criteria to identify important structures will definitely help the students in understanding the subject and performing good dissection. Irrespective of condition of cadaver of skill of the dissector on each table in the dissection hall, all the students will have at least one visual impression of ideal dissection and uniform understanding of the structures due to briefing. It will
also save time and effort of repeating same instructions on each table of dissection hall. Once prepared, the PPT can be used repeatedly for many batches at multiple places.

Photograph No. 1: Dissection of Parotid Region

![Photograph No. 1: Dissection of Parotid Region](image1)

1. Parotid gland
2. Superficial temporal artery
3. Auricle temporal nerve
4. Temporal branch of facial nerve
5. Zygomatic branch of facial nerve
6. Buccal branch of facial nerve
7. Parotid Duct
8. Marginal Mandibular branch of facial nerve
9. External Jugular vein

Photograph No. 2: Dissection of Carotid triangle of neck.

![Photograph No. 2: Dissection of Carotid triangle of neck](image2)

1. Hyoid bone
2. Superior belly of omohyoid muscle
3. Inferior belly of omohyoid muscle
4. Common carotid artery
5. External carotid artery
6. Internal carotid artery
7. Internal jugular vein
8. Vagus nerve
9. Ansia cervicalis
10. Scalanus anterior
11. Brachial plexus
12. Clavicle

Photograph No. 3: Dissection of Thyroid Gland

![Photograph No. 3: Dissection of Thyroid Gland](image3)

1) Isthmus of Thyroid Gland
2) Right lobe of Thyroid Gland
3) Left lobe of Thyroid Gland
4) Superior Thyroid Artery
5) Superior Thyroid Vein
6) Superior Laryngeal nerve
7) Inferior Thyroid Artery
8) Inferior Thyroid Vein
9) Recurrent Laryngeal nerve
Photograph No. 4: Dissection of thorax and neck for relations of great vessels.

References: