Methods of Teaching gross Anatomy

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Backgrounds

• Anatomy is a foundational course for all programs in medicine and health sciences.
• Many approaches exist for teaching anatomy dissection, prosection, models, computer software and medical imaging.
• Each approach has strengths and weaknesses.
• Traditionally, learning anatomy has been dissection-based.
• Virtual dissection tables represent a new method for teaching anatomy.
• The college of Medicine at University of Baghdad recently acquired a SECTRA visualization table,
Objectives

• **Discuss** the traditional and **modern** methods of teaching anatomy

• **compare** between these methods and their efficacy in medical education.
A. Wet cadavers
Dissection of human cadavers is fundamental for the practical teaching of preclinical anatomy because of many reasons.

- The students not only actively acquire knowledge but also skills that will be advantageous later on.
- Dissection familiarizes the students with tools and procedures that will be widely used posteriorly during their clinical courses and medical practice.
- Gives students a more accurate perspective of size and location than can be obtained using computer.
- Students can get the context of the surrounding organs and tissue for a thorough comprehension of the organ under observation.
- Dissection does challenge the students with severe and clear visions of death perhaps for the first time in their lives.
Proper way of dissection

• The **teachers dissect halves of the allotted cadavers** in presence of and with the help of students.

• Following this guide, **the students then dissect selected regions of the other side of the cadavers**
The *traditional cadaveric dissection*, though ideal for *most of the anatomy teaching*, may not be a very suitable tool in teaching the so-called “*difficult and challenging*” areas like the perineum.
B. Plastination
Plastination

• is a technique of tissue preservation developed by Dr. Gunther von Hagens in 1977.
• In this process, water and lipids in biological tissues are replaced by curable polymers (silicone, epoxy, polyester) which are hardened, resulting in dry, odorless and durable specimens.
• Plastination of an entire body requires about 1,500 working hours and normally takes about one year to complete.
At New York University, College of Dentistry, plastinated specimens can be a highly successful replacement for dissecting cadavers in dental school.
Anatomy Lab at the University of Lausanne

Per topic there are **four tables with wet specimens.**

On two tables in the middle row plastinates and **bones** are on display. For the supervision and answering questions, there are **two professors** and **3-6 assistants** available. These practicals are **quadrupled.**
C. Visual dissection tables

1. Anatomage Table

2. SECTRA Visualization table
1. Anatomage Table

- Developed by Anatomage Inc. In San Jose California
- **Touch – interactive** display system
- **Life-sized** form
- **3D gross, whole body** female and male models
- **3D high resolution regional anatomy** with skeleton, muscles, organs and soft tissue
- **Library** with pathology images
### Compare to cadaver Lab

<table>
<thead>
<tr>
<th></th>
<th>Anatomage Table</th>
<th>Cadaver Lab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemicals</td>
<td>No</td>
<td>Formaldehyde, methanol, phenol, and other solvents</td>
</tr>
<tr>
<td>Facility</td>
<td>No special requirements</td>
<td>Ventilation, freezer, storage, and disposal</td>
</tr>
<tr>
<td>Regulation</td>
<td>No regulation</td>
<td>May require permits and regulation</td>
</tr>
<tr>
<td>Number of cases</td>
<td>Unlimited number of cases</td>
<td>Single case for each student</td>
</tr>
<tr>
<td>Recurring cost</td>
<td>Minimal</td>
<td>New cadaver acquisition every year</td>
</tr>
</tbody>
</table>
2. The Sectra Visualization Table
### The Sectra Visualization Table

- developed in cooperation with Center for Medical Image Science and Visualization (CMIV), Visualization Center C, The Interactive Institute and Linköping University, Sweden.
- is a large, multi-touch medical display
- software that facilitates interaction with 3D images of the human body created by modern computer tomography or magnetic resonance cameras.
- Students are able to zoom in, rotate or cut into the visualized body without using a scalpel or destroying the subject.
- used by universities and training hospitals in more than 15 countries throughout Europe, the Middle East and Southeast Asia.
Efforts of SECTRA

- improve medical education
- provides the orthopaedic surgeon with a pre-operative planning tool for the complex orthopaedic cases.
- can improve pre-operative planning
Conclusion

- Plastinated specimens can be a highly successful replacement for dissecting cadavers in medical and dental school.
- Visual dissection tables are the optimal complement when cadaver-based dissection courses is not available, or when the cadavers are too few.