

## HUMAN ANATOMY: SCIENCE, ETHICS, DEVELOPMENT AND EDUCATION.

RUEDA ROBERTO\*, HERNÁNDEZ JUAN\*

*\* Research Group for Education Anatomy, Faculty of Medicine, University of the Andes, Bogotá DC Colombia.*

For centuries, the study of anatomy has remained as a neutral science from the ethics point of view, considering the good dissection and elimination of the specimens as its core. This image has been kept since the beginning of its study all the way to its development with the formaldehyde discovery, which allowed extending dissecting time, limited earlier by the natural putrefaction process, and until now, when polymers, special preparations and exhibitions are used in teaching and research.

The currently described crisis in the process of teaching-learning anatomy generated two educative currents widely used around the globe. One, still based on cadaveric dissection, considered as a vital tool. The second, using mainly the wide range of tools that the advancing technology has enabled to develop. However, these currents are not used excluding one or the other, and it is common that anatomical education uses a mixture of both to carry out the task of teaching, not only descriptive anatomical aspects but the noble labour of inculcating in the future medical doctors ethical values regarding the human body and medical practice.

There exist countless cases of non-ethical use of the human body for anatomical study. The resulting knowledge should not be demonized or censored, since even under erroneous political pressures, the study of anatomy and the use of the Human "Atlas" is a tribute to those who have died. It should rather be analyzed to become a valuable tool in teaching ethics and history to the future medical practitioner.

Nowadays, few countries have raised ethical and legal considerations under which must be governed the study of the human body. Colombia is one of the exceptions, as only a small amount of topics are regulated by the National Forensics and Legal Medicine Institute (INML, Spanish acronym for Instituto Nacional de Medicina Legal Ciencias Forenses) (7) within the wide range of activities the human body study carries out. Everything else is dictated almost exclusively on the basis of respect for the human body. Apparently, laws are more determined to deal with issues such as diagnosis, treatment and rehabilitation of diseases than they should be in an area as sensitive as cadaver's use in education.

Therefore, it is important that in an environment of freedom, both in and outside the amphitheatre, the future medical practitioner be trained by anatomists in an area of such sensitivity as medical ethics. Thus, a primary task for the researcher, teacher or dissector is to inculcate ethics and respect within the medical training activities as fundamental competencies in medical practice.

Considered for centuries as one of the mainstays of medical education and historically a cradle of ethical and religious dilemmas due to utilization of cadavers or anatomic 'Atlases' for its study, anatomy has traversed a long way under the image of an ethically neutral territory (1), all based on the way the human remains are preserved and presented (2), and dedicated to the descriptive study of macroscopic anatomy. A probably mistaken image that nowadays has been attempted to be discarded (1).

Since the discovery of formaldehyde in the XIX century, the study of anatomy could be prolonged during the time the specimen supported the dissection, and the restraint determined by the natural putrefaction process stopped being an issue. Ever since, the initiation of a race in search of novel and improved preservation techniques in favor of teaching, anatomy study and freedom to exert it was undertaken, often setting aside the ethical considerations which those techniques use could carry along.

According to these developments and presumably to the fact that anatomy teaching and learning are going through a crisis (3,4,5), two trends for teaching anatomy were proposed. The first insists on use of cadaveric dissection, considered as an activity with a high moral, reflexive, emotional, and psychological impact, deemed even as a "vital activity" (6), which also provides the student with a tridimensional view of the structures (7). The second one, known as "Modernist" approach (8), is focused on the use of technological tools. Those who adhere to this current assure that cadaveric dissection is an expensive and emotionally disturbing activity promoting fear and anxiety among those who practice it (9). Both cadavers and virtual reality have been demonstrated to be motivating tools (10) and it has been determined that a mix of those two tendencies shows better results than using

any of them separately (11). For this reason, cadaveric dissection has been a crucial element to be considered, not only in anatomic education but in the ethics of the future medical professional (12).

In 1977, with the introduction of plastination by Doctor Gunther von Haggens and his exhibition of “Body Worlds”, not only the anatomists’ eyes but those of the whole world went back to focus on the human body causing both admiration (13) and annoyance even among the scientific community who considered this nonconventional way of human body exposure as anti-ethical and offensive (14). However, today the anatomist should confront the challenges posed by that exposition since there is an imperative need to implement that what was exhibited to the world, both in anatomy teaching and research (14) within the medical environment.

Historically, clearly special cases were observed during the span when these changes took place, such as work performed by anatomists during the Third Reich era, in which is clearly illustrated that theory and practice of a science depends on the existent political system (15) entailing a transition from an ethical practice of dissection to an unethical use and disposal of cadavers (16) which were abandoned under the acronym N.N., from the Latin term “*nomen necio*” (unknown name), in the Nazi concentration camps (17). These censurable cases show that goodness can derive from evil as well, and continuous use of human “Atlas” is the best tribute to those who have died. Furthermore, it has always been, and still is, a valuable tool, not only in anatomic education but in ethical and historical formation of the future medical professional (18) provided that the context is explained and made explicit.

Presently, only in a few countries ethical and legal considerations for human bodies donation for plastination and study have reached a consensus in which the donor must have expressed his (her) decision while is alive (19). In the case of Colombia, likely in many other countries, anatomy research is ruled only under the premise of respect for the human cadaver (20), both inside and outside the anatomy laboratory (21), principle instilled early in the medical formation. Laws seem to be more determined to rule in diagnosis, treatment and rehabilitation of the disease than they should be in areas of such sensitivity as current anatomic education (22); this is the case with the regulations concerning the informed consent in anatomic pathology (23).

Colombian legislative literature only stipulates clearly that scientific or educational institutions can have at their disposition unclaimed cadavers and organs (originating from those cadavers) for teaching and research purposes through the National Forensics and Legal Medicine Institute (INML, Spanish acronym for ‘Instituto Nacional de Medicina Legal y Ciencias Forenses’) (24). This institution safeguards the fulfillment of the ethical and legal regulations during the process of the specimen delivery.

The principle of autonomy should also be considered, which is extrapolable from the case of organ donation for transplant, since it represents the humanitarian willingness of the dead person (25) to donate his (her) organs to be transplanted, or in this case, to be studied. This regulation is not yet defined but could be used through the figure of the informed consent given while the deceased person was alive or by relatives following his (her) death.

In Colombia, the ethical management within anatomy laboratories is not yet linked with any regulation and, therefore, the correct treatment and management of cadavers, organs and specimens drawn from them is associated with the judgments of the investigator, dissector, professor or student who manage them or the institution where these practices are being performed. The only mechanism that ensures it, and only partially, is the regulation on practices of medical-legal autopsies and viscerotomies, which have been classified into sanitary, educational and investigative (26), and should be carried out only by staff certified by INML or those who are completing their mandatory social service (1-year rural service).

Topics of such importance as professional secret, which must be kept both for respect to the deceased and his (her) relatives (27), are left to the discretion of those who perform the cadaveric dissection in University laboratories, and only are inculcated by the professor if he (she) determines to do so.

This being the case, it should be ensured that the process of anatomy teaching and learning, whether it takes place using cadavers, their parts, alive individuals, or even materials obtained from them, takes place under a setting of respect and compliance with the ethical principles inherent to formative activities of the future doctors along with the upmost scientific values (28).