

COMMENT

# Ethics of the use of dead human bodies in anatomy teaching in India

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**Abstract**

*The study of the human anatomy predominantly requires the use of remains of the dead. Unclaimed bodies are easily available in India; however, there is a lack of clear ethical guidelines governing their transport and exchange. We raise pertinent questions about the ethical implications of using unclaimed bodies in teaching anatomy, their transport, transfer and storage, ethical and legal issues regarding the voluntary donation of bodies and dry human bones, as well as the commercial aspects of body donation. We also examine existing practices in anatomy departments in India, and explore the available legal safeguards. We detail practical and ethical challenges in the existing practices and safeguards and attempt to provide solutions.*

**Keywords:** anatomy teaching, body donation programme, ethics, informed consent, procurement of cadaver

In the 1820's William Burke and William Hare murdered 16 individuals in Edinburgh, Scotland, and sold the corpses to Dr Robert Knox, an anatomist, for purposes of anatomical dissection [1]. Though anatomists have come a long way since then in the manner of procurement of cadavers, the use of unclaimed bodies for purposes of anatomical dissection is prevalent even today [2].

**Ethical dilemmas arising in the use of unclaimed bodies in teaching Anatomy**

Consent cannot be obtained for the dissection and preparation of museum specimens if unclaimed bodies are used for these purposes. This violates one of the basic principles of ethics, ie, autonomy. Some may argue that the state is responsible for the interment of unclaimed bodies [3], and therefore, can assign the bodies to a recognised medical

institute for dissection [4]. Here, the principle of common good overrules the principle of autonomy of the dead individual. From an ethical point of view, schools have the option not to accept unclaimed bodies for dissection. In this case, they would be rejecting material that is readily available and permitted by law for use in medical education and research. While this might protect the autonomy of the dead, it also means a lack of cadavers for dissection, especially in those regions that face an acute shortage of voluntarily donated bodies. However, as Beauchamp states, "method in ethics begins with the moral convictions that inspire the highest confidence and that appear to have the lowest level of bias" [5]. Most unclaimed bodies sourced for dissection belong to those from the marginalised sections of society [6]. Using them for the purpose of anatomical dissection thus comes with inbuilt bias. Hence, although Anatomy Acts, which are opt-in laws, permit the use of unclaimed bodies for anatomical dissection [4], the practice does not conform to the high standards of ethics that Indian medical colleges should strive to achieve.

**Ethical and legal issues related to voluntary donation of bodies**

The Maharashtra Anatomy Act, 1949, permits a request to donate their body or a part of it, expressed by a person in writing or orally in the presence of two or more witnesses, during the former's last illness that resulted in death [4]. There is no provision in the Act for a healthy individual to pledge their body for voluntary donation. Further, relatives of the deceased may be unwilling to donate the body despite the individual having consented. This presents a conflict between the autonomy of the deceased individual, and the rights of ownership of the dead body by the next of kin. From a legal point of view, as per the provisions of the Maharashtra Anatomy Act, Section 5B, the next of kin has a right to refuse to donate the body if:

- They have reason to believe that consent given by the deceased was subsequently withdrawn.
- A near relative of the deceased objects to the body being so dealt with.
- The person in lawful possession of the body believes there is need for an inquest or a post mortem [4].

Most body donation registration forms have a "no objection clause" that needs to be signed by either close relatives or a

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person who will have lawful possession of the body in the absence of close relatives [7].

The expectation of compensation by a volunteering body donor or their relatives, whether from institutions or the state, has ethical implications. Most potential donors seem ready to donate their bodies after death to anatomy departments, without expecting financial or other gain. However, in India, paid organ donors exist despite the fact that paying for organs is a punishable offence [8,9], just as many women chose to be surrogate mothers for financial gain [10] until the Surrogacy Regulation Act, passed in 2021, allowed only altruistic surrogacy [11]. Would it then be unreasonable for a poor individual or their relatives to expect compensation for voluntary body donation? Similarly, if the relatives, due to unaffordable funeral costs, donate the body to an institution even though the deceased did not consent to the same, would the relatives be wrong? In such a case, should beneficence and common good override the autonomy of the deceased?

### **Barriers to accessing a body donation programme**

In a study on trends in body donation worldwide, data was obtained from 68 countries. Of those, only 22(32%) countries exclusively use bodies that are bequeathed to them by voluntary donors, while 21(31%) exclusively use unclaimed bodies. Even in the 21st century, 45(66%) of the countries, use unclaimed bodies for anatomical dissections and research [2]. In India, while anatomy departments use cadavers from both sources, the majority of them are unclaimed bodies [12, 13]. Still, there is increasing awareness worldwide about body donation to anatomy departments. For example, the International Federation of Associations of Anatomists (IFAA) drafted guidelines in 2012 for body donation [14]. It would be worthwhile to examine why body donation (as opposed to use of unclaimed bodies) has not translated into action in India. The reasons, stated as follows, are manifold, and the solutions would likewise need to be multipronged.

- As per the law, the use of unclaimed bodies for dissection is acceptable in India. In the states of Maharashtra, Goa, Himachal Pradesh, Punjab, Sikkim, Madhya Pradesh, and Assam, there is no provision in the state Acts for an approved medical institution to refuse an unclaimed or donated body [15]. Further, if an institute already has unclaimed bodies far in excess of its need, there is no incentive for it to promote body donation.
- The setting up of body donation cells by medical colleges is voluntary. Many new colleges have neither the workforce nor the infrastructure to set up a body donation programme. Currently, there is no compulsion or incentive for them to do so.
- Not all body bequests fructify into a donation. The reason for this is the unwillingness or inability of the relatives to fulfil the wish of the deceased, owing to

conflicting beliefs. In addition, in most body donation programmes, the responsibility for and cost of transporting the mortal remains to the anatomy department have to be borne by the relatives [7].

### **Concerns of body donors and their relatives**

A potential donor or their relatives may have concerns about the transportation of mortal remains to the institution, their handling in the process, utilisation of the mortal remains by the anatomy department, and the process for the disposal of the mortal remains. Given next is an exploration of these concerns, followed by possible safeguards to address them.

#### ***Logistics of transporting mortal remains to the institution***

The body needs to be brought to the institution within 3–5 hours of death. Documents required at the time of donation from the relatives are: a death certificate issued by a registered medical practitioner, a disposal permit issued by the local governing authority, and an application by the next of kin requesting acceptance of the donation [16]. Arrangements for transporting the dead body to the institution, within a reasonable radius, such as having a dedicated hearse for this purpose, would be a great help to the relatives, who are likely to be distraught. Moreover, honouring the relatives by acknowledging their contribution in the form of a certificate or memento would not be amiss. Another suggestion is for the faculty member present at the time of receipt of the body to present a eulogy during a body donation ceremony. Such a model has made the body donation programme in Northern Thailand a great success, resulting in a four-fold increase in the number of registrations for body donation and a six-fold increase in the number of body donations made in 20 years from 1998 to 2018 [17].

#### ***Will the body be treated with respect?***

A qualitative study on the expectations of body donors and their families in Bangalore found that the next of kin expect that the body should be treated with respect. Potential body donors enrolled in the study expected medical students to respect the cadaver and to demonstrate this in their behaviour. They also wanted students to feel motivated to eventually donate their own bodies for dissection [18]. To ensure a successful body donation programme, the dignity of the donated body must be maintained.

The attitude of medical professionals towards donating their own bodies for medical education and research needs to be changed. A study in Manipal, India showed that only 22% of physicians were willing to donate their bodies to medical education, while 68% expected the public to donate [19]. Even anatomists are hesitant to donate their bodies. In two separate studies, only 15.7% of Turkish [20] and 25% of Dutch anatomists expressed willingness to donate their

bodies to medical teaching [21]. In a study conducted by Mwachaka in Nairobi, only 22.2% of undergraduate and 19.5% postgraduate medical students were willing to donate their own bodies for anatomical dissection [22].

The authors believe, that members of the medical community are more likely to donate their bodies when convinced about the dignity accorded to cadavers. This could have a ripple effect in boosting body donations by the general public.

The introduction of the Attitude Ethics and Communication (AETCOM) modules in the undergraduate curriculum of MBBS students by the National Medical Commission, India, is a step in the right direction. In one module, four hours are dedicated to introducing students to the concept that the cadaver is their first teacher [23]. Students are administered a cadaveric oath during a ceremony. Administering the oath to the students in its true spirit and explaining the contribution of the deceased (whether a body donor or an unclaimed body) to their learning process is of utmost importance.

The following are some global practices demonstrating the respect accorded to the donated cadavers that could be adopted by Indian medical schools in order to promote body donation as a concept:

1. Most medical schools in the United Kingdom inform students of the details of their body donation programme [12]. One school introduced a medical humanities project, in which students of medicine reflect on topics like mortality, death, and ethics [12]. Such initiatives help sensitise medical students and ensure that they treat cadavers with respect.
2. Malaysia tried to increase enrolment in its body donation programme by showing potential donors the existing protocols, facilities, and processes in place for handling a body in the anatomy department [12]. A video demonstration could also be used for the purpose.
3. Altruistic body donation began in countries like Spain in the early 1970's with anatomists visiting ambulatory centres and homes for the elderly to promote the concept of body donation. The media also spread awareness about the programme [12]. These initiatives are now no longer required in Spain, as there is sufficient awareness in the community and donors learn about the body bequest programme through word of mouth [12]. Thus, it is important to win the trust of the community and seek their co-operation to ensure a successful body donation programme.

#### **Lack of clarity on the use of the donor's mortal remains**

All possible uses of the cadaver for teaching and research must be clearly spelt out in the consent form. Some donors are likely to feel more at ease if they know how their body is likely to be handled and to what use it will be put, once

donated. Consent must be obtained to transport the body to another institution, to display body parts as a museum specimen or a plastinated specimen, and to disseminate data pertaining to the donor for educational and/or research purposes. Consent must also be given for the use of body parts in surgical training workshops that may involve dismembering the body and commercial gain by the organiser of the workshop. Permission is necessary for the institution to access the donor's ante mortem medical records for research purposes. Any access to personal ante mortem medical records would be restricted in its use as a research tool, and utmost care must be ensured to maintain confidentiality. The potential body donor and their relatives need to be reassured about this.

#### **Lack of transparency about the process of disposal after dissection**

Some body donation centres in India state the method of disposal (usually incineration) in the consent form [7]. A city like Mumbai for instance, has 10 medical colleges and only 2 incinerators — in Govandi and at Taloja, Navi Mumbai. The mortal remains, after dissection, are cut into manageable pieces and collected for disposal as biomedical waste. Considering the amount of biomedical waste that a city like Mumbai generates — more than 10,000 kg/day in 2011 — it is doubtful that material collected from anatomy departments is segregated prior to incineration [24].

The Bombay Anatomy Act, 1949 as modified on January 13, 2014, is applicable to both unclaimed bodies and donated cadavers received by an institution in Maharashtra [4]. It clearly states that,

*"... such body, after being dealt with for any of the purposes of this Act, be decently cremated or interred in consecrated ground, or in some public cremation or burial ground in use for persons of that religious persuasion, to which the person whose body was so removed belonged; and that a certificate of cremation, interment or burial of such body shall be transmitted to the Executive Magistrate, or any officer appointed by the State Government for such purposes, **within six weeks after the day on which such body was received** as aforesaid."* [4: Sec 5F, emphasis added]

The normal course of teaching anatomy by dissection to students spans at least 12–18 months. Quite obviously, the donated cadaver cannot be cremated within six weeks of receipt. This unrealistic condition of the Act is next to impossible to follow. The Act could be amended to allow medical colleges to remain in possession of the body for up to 2 years from the date of receipt. However, such an amendment could be made after discussions with all stakeholders.

In case of a donated body, the mortal remains after dissection may be cremated or buried as per the wish or religious persuasion of the donor, if this has been expressed

at the time of body donation. In the case of unclaimed bodies, as the religion and wish of the deceased may not be known, the mortal remains, after dissection, may be buried or cremated according to the convenience of the institution. From an ethical perspective, segregation of the mortal remains of individual cadavers and a dignified method of disposal should be practised for both donated and unclaimed bodies. Northern Thailand has a royal cremation ceremony for body donors [17]. The University of California organises memorial services to honour those who donate their bodies to research and education [17]. The relatives of the deceased are often invited to be a part of these ceremonies. Institutions should be encouraged to have services of thanksgiving or commemoration for those who donate their bodies to medical education or research. Relatives of the deceased, along with staff and students, may also be invited. Such a ceremony can be held for unclaimed bodies that were used by an institution for anatomical dissection. The faculty and staff may pay their respects to these individuals who contributed to their learning.

### **Concerns regarding transport and transfer of cadavers and body parts**

In India, the Anatomy Acts are state Acts. There are discrepancies between different state Acts, which make national guidelines necessary to ensure uniformity across states [15]. A law governing the transport and transfer of cadavers and body parts is missing from all these Acts [15]. Medical colleges without an existing body donation programme are dependent on the transfer of cadavers from institutes with such programmes or from government institutes that receive unclaimed bodies. The absence of a law covering transfer and transport allows for loopholes in the system and the possibility of profiteering by unscrupulous officials. The IFAA guidelines state that there should be no commercial gain in supply of cadavers/body parts/plastinated specimens to another institution. However, charging for real costs incurred, including those for maintaining a body donation programme, is acceptable [14].

Medical colleges in many countries in the Middle East, Africa, and Southeast Asia rely solely on imported cadavers for anatomy education and research. The main suppliers of these cadavers are the United States of America (mostly supplying donated bodies), and India (mostly supplying unclaimed bodies) [2]. Needless to say, there is a strong possibility that a commercial transaction is taking place in the sourcing of cadavers from another country or institution. The IFAA guidelines emphasise the immediate need to establish guidelines regulating the transport of body parts and cadavers within and between countries [14].

### **Concerns regarding storage of cadavers and body parts**

Most anatomy departments have organs and body parts from indeterminate sources in their archives. The use of this

material for teaching and/or research, especially for an indefinite period and without the consent of the next of kin, poses an ethical dilemma [25]. In addition, in the absence of an audit, the possibility of pilferage of material or illegal concealment of body parts or the cadaver cannot be ruled out. Therefore, in order to safeguard the interests of the deceased and of medical institutions as their custodians, it is imperative that:

- Facilities where cadavers are stored be secured from entry by unauthorised personnel. We may consider closed circuit television (CCTV) surveillance of these areas and authorised access under the supervision of a responsible officer.
- Efficient tracking procedures for the identification and location of all body parts from an individual donor be ensured. This will safeguard against foul play and improve the quality of research.
- Periodic audits be conducted by a team of peers, to check for documentation of the sources of cadavers, and to account for all cadavers and body parts.

### **Considerations regarding procurement of dry human bones**

The study of osteology is integral to the understanding of anatomy. Students of the subject are expected to possess a bone set. Anatomy departments must necessarily have a minimum number of bone sets for education and research.

India has the dubious distinction of being a human bone factory, having exported human skeletons to medical institutions across the world. These bones were procured by employing grave diggers. In 1984, India exported about 60,000 skeletons. In 1985, the Indian government banned the export of bones and other body parts [26]. Currently, there are only a handful of dealers in India who trade in original bone sets. These are sold only to medical institutions and medical students in the country on production of a valid identity card. Their stock is limited and the price prohibitive. Students therefore procure artificial bone sets made of materials such as polyvinyl chloride (PVC). Medical students end up purchasing original bone sets of dubious antecedence from their seniors and the grey market [27, 28]. Most of these are incomplete or mixed sets (sourced from different cadavers) and are often damaged [28]. There is no provision in the Maharashtra Anatomy Act for harvesting bones from a cadaver for education and research [29].

If all medical colleges with an established body donation programme were to harvest the skeleton of the body donor upon completion of dissection (with prior consent), they would have a continuous supply of material for osteology studies with the added advantage of labelling for each bone sourced from a particular donor [29]. This will also reduce

the need for students to procure bone sets from dubious sources. A provision may be made in the law to share these indigenously processed bone sets with newly set up medical colleges until they become self-sufficient. This will also ensure the most effective utilisation of the donated body.

### The commercial aspect of body donation

The ethical guidelines of the IFAA and many state-run body donation programmes in the United States, state that there should be no commercial gain for institutions from body bequests [14,30]. Bequests by donors enrolled in voluntary body donation programmes are entirely altruistic. However, body brokers do exist in the US; they run enterprises for profit and sell body parts to surgical equipment manufacturers and entities who conduct workshops to train surgeons [30]. The trade-off here is that the funeral cost is borne by the body broker (though a funeral of the entire body is not performed in many instances as it is dismembered and supplied to various different entities on a rental basis, or sold for profit) [31]. In India too, anatomy departments regularly conduct cadaveric workshops where surgeons hone their surgical skills or learn new techniques. The end user pays a handsome amount for this. The irony is that the body donor remains the only entity demonstrating altruism in this scenario. Considering the immense commercial potential of a body bequest, we wonder if it would be ethically permissible to compensate a potential body donor monetarily or in kind in their lifetime if they so desire, with the understanding that they will donate their body after death.

### Suggestions

In view of the ethical concerns surrounding the procurement, use, and disposal of cadavers, body parts, and dry bones required for teaching human anatomy, and the lack of legal safeguards in some of these areas, here are some suggestions to facilitate anatomy teaching:

- Encourage and incentivise the setting up of body donation programmes by the medical colleges.
- Gradually phase out the use of unclaimed bodies for dissection.
- Establish guidelines for the transport and transfer of cadavers to dental, physiotherapy, and newly established medical colleges.
- Establish uniform guidelines for the dignified cremation or burial of mortal remains after completion of dissection.
- Restrict access to cadaver rooms, and equip them with continuous CCTV surveillance.
- Ensure the tagging of all prosected specimens and bones.
- Harvest bones from donated cadavers after the

completion of dissection (with prior consent). Legalise the sale of these bones to educational institutions and bona fide students.

- Regulate and make transparent the commerce intrinsic to body donation programmes and the handling of cadavers, including subsequent transfer for use by another institution, or use of cadavers and body parts in surgical training workshops. Consider compensating the body donor and/or their relatives for the donation.
- Make the necessary changes in the existing Anatomy Acts so that the above suggestions may be implemented within the ambit of the law.

### Conclusion

Anatomy is a basic science subject and the foundation of surgery. Anatomists start working with students when the latter are young, and are instrumental in moulding them to become medical professionals. Ethics, like communication and attitude, is largely learnt by observation. It is therefore important that the teachers and researchers of this speciality follow the highest ethical standards and demonstrate them in the treatment of fellow human beings in life and in death. This can be achieved by actively working towards promotion and facilitation of voluntary body donation and ensuring responsible and accountable utilisation of the donated body.

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