Body Donation: An act of love supporting anatomy education

Abstract
Cadavers for anatomical dissection in Japan are supplied totally by body donation. At present, 210,000 persons have been registered for body donation and donation of 77,000 bodies has been conducted. The supply is generally sufficient. To extend the spirit of love associated with body donation, Tokushi Kaibo Zenkoku Rengokai [National Confederation of Anatomy Body Donation] conducts PR activities using publications and lecture meetings. A distinct feature of body donation in Japan is the fact that the ashes after dissection are returned to the families of body donors. This practice reflects the strong attachment of Japanese people to the remains of deceased relatives. In Western countries, the ashes are not usually returned to the families, and donated bodies are used for various purposes, such as the study of human body damage in car crash experiments and the preparation of anatomical specimens for exhibitions. Japanese laws place restrictions on cadaver dissection with respect to place, instructors, purposes, and courtesy, and strictly limit the use of cadavers for purposes other than the education of medical students. Medical students in Japan perform dissection with deep understanding of the goodwill of body donors and the feelings of their families. This fact contributes tremendously to the effectiveness of ethical education.

Key words Medical education, Cadaver dissection, Body donation, International comparison

Introduction
Every year, a large number of students are admitted to the medical and dental faculties of colleges and universities in Japan, and experience cadaver dissection. The number of students in a year exceeds 10,000, approximately 8,000 in medicine and 2,500 in dentistry, and the number of donated bodies used in the dissection courses for them is approximately 3,500.1,2 The cadaver dissection course is the gateway to a medical career for almost all students aspiring to work in medicine, and the source of precious memories that are the first to be recalled when they later look back on their student days. Probably most of the 270,000 physicians in Japan dearly remember their school days with recollections of their hard work in the dissection course and the personality of their anatomy professors.

Decades ago, the bodies used for cadaver dissection were mostly those of persons that had died from sickness without relatives. At present, almost all bodies for cadaver dissection are donated. Body donation is the act of giving away one’s body after death without any conditions or rewards for the sake of education and research in medicine. When a body is donated, it takes 2 to 3 years before dissection is performed, cremation is done, and ashes are returned to the family.

Rumors were once circulated that body donation was rewarded with money or favoritism in the provision of medical services at hospitals. I do not deny the possibility that some university staff might have provided some benefits at their
discretion in the 50-year history of body donation. However, present day body donation has nothing to do with such provision of benefits. Body donors are wholeheartedly glad that their bodies will serve the progress of medicine after death. Taking the gratuitous love of body donors, students learn human anatomy and start their first steps towards becoming fully trained physicians.³

This article, outlining the distinctive features and present state of anatomy education and the body donation movement in Japan, calls for further understanding and support of all people engaged in medicine.

Present State of Anatomy Education

With the rapid progress of medicine, medical education has been undergoing incessant drastic changes. As compared with the times when I was a student about 30 years ago and when I started to teach at Juntendo University about 15 years ago, medical students nowadays need to learn much more in the same length of 6 years.

For effective learning, textbooks and reference books have been improved to be more user friendly and direct, and the use of Power Point during lectures now helps the delivery of sufficient knowledge in a compact timetable. The means to increase the learning ability of medical students have also been introduced, such as early start of experience-based learning and small-group tutorial classes. To standardize medical education, the core curriculum was developed in 2001, and the Computer Based Testing (CBT) for measuring the achievement of medical students in Japan was introduced in December 2005. In the context of continuing change in medical education, the position of cadaver dissection requires constant revision.

The number of hours allocated to cadaver dissection and lectures in anatomy has decreased considerably. However, it always remains true that cadaver dissection is the core part of education in anatomy, and anatomy provides the foundation for the entire medical education. The greatness of the mental and physical burdens associated with dissecting human bodies also remains unchanged. As medical education has become more and more standardized and efficient, the role of the cadaver dissection course has become even more important. It provides a precious occasion for students to be confronted with the human body. The body of a person lying in front of them means various things for the person, for the family, and for physicians. With such thoughts in mind, students excavate nerves, blood vessels, organs, muscles, and other structures, and explore the mechanisms supporting the human body.

At Juntendo University, students of the school of medicine attend the dissection course from late October to early February in the second year. The moment when students meet the body to be dissected is full of tension. Each body on the table is a person, who has lived a life of several decades, and is lying there because he or she wanted to. Everybody in the dissection course silently prays for the souls of body donors (Fig. 1). However, once the covering cloth is removed, and a knife cuts the skin to reveal the interior of the body, the body instantly becomes a cadaver. During the 4 months that follow, students are busy identifying and removing each and every structure constituting the human body—muscles, blood vessels, nerves, thoracic and abdominal organs, etc. They realize that the body of a person is an assembly of tangible objects. The experience of doing this using their own hands is invaluable. On the other hand, students are fully aware that the structures taken out of the cadaver are something more than physical objects. This is because they have met the body as a person with dignity, and because they themselves have changed it to an object of science called a cadaver.

On the other hand, body donors are proud
of being body donors and find fulfillment in con-
tributing to society. The late Mr. Akira Nawa,
former President of “Shiraume-Kai” society of
body donors to Juntendo University, used to
say that he was taking good care of his body so
that he could better serve medical students. The
body donors to Juntendo University gather at the
general meeting of Shiraume-Kai, held every
year in the fall. Juntendo considers this meeting
as an important occasion for expressing thanks
to body donors, and the meeting is incorporated
in the curriculum of second year students, who
perform cadaver dissection. All second year stu-
dents cooperate in the operation of the meeting
as volunteers. They sit around the same tables with
body donors and have conversation. Through
this direct interaction, body donors are reassured
of their roles in helping the development of
medicine, and students understand the profound
meaning of being allowed to dissect donated
bodies. Thus, body donors are helping the growth
of medical students, and medical students are
giving a sense of fulfillment to body donors. I
quote the following words by a student.

When I was in front of the body, I was
intimidated by the presence called death. I felt
as if my heart was squeezed tight. Probably
because I had seen the death of my grand-
father, I was going to be overwhelmed by the
seriousness of the meaning of death. Prompted
by my mentor, I took up the knife, which felt
heavy. I hesitated, because of the doubt that it
might be wrong to cut into a body that should
be respected, and a complete stranger like I
might not be allowed to touch the body in such
a way.

Encouraged by the serious undertaking of
my mentors and friends, I was able to complete
the course. However, I have not forgotten the
anxiety and discontent I felt in the beginning.
As time passed, I came to realize the
thoughts of body donors and their families
who agreed on body donation. I am sure that
their decisions were the result of their strong
will, as well as much emotional conflict. I felt
sincere gratitude for their goodwill. I wished
I could bow in front of body donors in life
and thank them and their families. As this was
no longer possible, I thought the only thing
I could do for them was to continue study-
ing with respect and thankfulness. (From the
speech by Ms. Asako Nishino, the representa-
tive of students, at the ceremony of returning

(Compiled from Tokushi Kaibo Zenkoku Rengokai: The State of Body Donation, List of Associations 2006.)

Fig. 2 Number of persons registered for body donation and number of body donations conducted, compiled from
data for donor associations
ashes of body donors for systemic anatomy, Juntendo University, 2006.)

Physicians do not often recollect the experience of cadaver dissection in their student days. Despite the fact that the dissection course had much to do with the development of their professional views on humanity and life, few consciously ask how they changed through this experience. A rare exception is the novel “Igakusei” [A Medical Student] written by Mr. Keishi Nagi in 1993. This novel describes the growth of a medical student with a vivid narrative of the memories of the dissection course.

Literary works featuring the thoughts of body donors seem to be even scarcer. The novel “Bizan” by Mr. Masashi Sada is the story of a woman who donates her body and the daughter of the woman. Their thoughts on body donation are given a substantial weight in this novel.

The Present Day Body Donation Movement

Tokushi Kaibo Zenkoku Rengokai [National Confederation of Anatomy Body Donation] is the organization formed by universities performing cadaver dissection and body donor associations in Japan. In cooperation with Nihon Tokushi Kentai Kyokai [Japan Body Donation Association], the Confederation performs outreach activities to promote the significance of body donation. It was established in 1971 against the background of a serious shortage of cadavers for medical education, and has been making active efforts to influence the government and various organizations.

Starting from 1982, body donors are presented with letters of thanks from the Minister of Education, Science and Culture (present Minister of Education, Culture, Sports, Science and Technology). The Law Concerning Body Donation for Medical and Dental Education (the Body Donation Law) was enacted and enforced in 1983. From this time, body donation became widely recognized in society, and the number of persons registered for body donation increased rapidly (Fig. 2). As of the end of March 2006, the accumulated number of persons registered for donation reached 210,605, and donation of 77,645 bodies has been realized. At present, the bodies for cadaver dissection courses in medical and dental faculties are almost completely supplied by body donation, and many universities are restricting or declining new registration for body donation.

After attaining the goal of securing a sufficient number of bodies, the body donation movement at present has two important issues that need to be addressed.

One is the realization of more enriched anatomy education through body donation. In other words, the goal is the qualitative improvement of body donation and anatomy education. To this end, the Federation is issuing various PR materials and distributing them to anatomy departments and body donor associations across Japan. Collections of writings by body donors and students performing cadaver dissection, entitled “Kaibogaku he no Shotai” [Introduction to Anatomy], are produced every year. (In 2006, the 26th volume of body donors’ writings and the 28th volume of students’ writings were published.) Another yearly publication is “Tokushi Kentai” [Goodwill Body Donation] distributed at the general meeting of the Federation. (No. 48 was published in 2006.) A manual for persons dealing with the practical aspects of body donation, entitled “Kentai no Tadashii Rikai no Tameni” [For Correct Understanding of Body Donation] (called the Body Donation Manual for short), and an informative document for persons wishing to register for body donation, entitled “Kentai Toha” [What Is Body Donation] (called the Leaflet for short), are always available on request.

The second issue is how we should permit the practice or observation of cadaver dissection in the anatomy education of co-medical students. The anatomy departments of most universities in Japan accept students from many co-medical training schools and they allow them to observe cadaver dissection without hands-on involvement in dissection. Many nursing schools operated by municipalities, medical associations, and hospitals are relying on the observation of cadaver dissection at anatomy departments of nearby universities. Through such observation of cadaver dissection, co-medical students gain first-hand experience on the internal structure of the human body and develop a sense of reverence towards the human body, similarly to the case of medical students performing cadaver dissection. Specialists in vocations involving direct contact with the
body of patients, such as physiotherapists and occupational therapists, are required to have deep understanding of human anatomy. For this reason, some institutions including national universities offer cadaver dissection courses for co-medical students including actual dissection using knives and forceps.

The legal basis for cadaver dissection performed by medical students is the Law Concerning Cadaver Dissection and Preservation enacted in 1949. It stipulates that dissection must be conducted in appropriate places (in anatomy dissection rooms), with instruction by appropriate teachers (by professors and associate professors in anatomy), and for appropriate purposes (to serve for medical and dental education). In addition, the Law demands that bodies must be handled respectfully. Although the expression is abstract, the ethical issue of the respect of a person’s body is addressed as a crucial matter. At present, the observation and practice of cadaver dissection for co-medical education are conducted under the responsibility of professors in anatomy, respecting the spirit of the Law Concerning Cadaver Dissection and Preservation and within socially acceptable ethical boundaries.

Distinct Features of Anatomy Education and Body Donation Movement in Japan

Body donors provide their bodies after death without any conditions or rewards, and students gratefully use their bodies without inconvenient limitations. Although this is taken for granted in Japan, situations in other countries differ completely. In the United States and European countries, the almost overabundant number of bodies is supplied through body donation, and the donated bodies are used for various purposes. The ashes after dissection are usually not returned to the families of the body donors.

Particularly in the United States, the uses of bodies extend widely beyond the scope of ordinary medical education. While an advantage is the possibility of the study of clinical anatomy using fresh frozen bodies, bodies are also used for various non-medical uses that are not imaginable in Japan. For example, bodies are reported to have been used in car crash experiments examining the damage to the human body for the purpose of improving safety devices on automobiles, and in experiments examining the impact of bullets and bombs on the human body for the purpose of improving protective body armors. In addition, a person managing the body donation program at the University of California Los Angeles was arrested for smuggling cadavers in 2004.

In Germany, restrictions on cadaver dissection are relatively weak. Private laboratories accept many donated bodies and produce plastinated specimens from them. These are presented at the exhibition called BODY WORLDS in various countries. Displaying cadavers arranged in various poses, such as riding a horse and playing chess, this exhibition has been the focus of much controversy. The German Anatomical Society has officially issued a statement against this exhibition.

China has no system of body donation, and medical students are unable to perform necessary cadaver dissection. Chinese students visiting Japan often admire the excellent cadaver dissection courses in Japan. On the other hand, there are workshops producing plastinated specimens in various locations in China. Although the origins of the cadavers are unknown, many anatomical specimens produced at such workshops are exported. Commercial-based human anatomy exhibitions using Chinese-made specimens are held in Japan and Korea, attracting many visitors.

In Taiwan, a body donation movement was commenced by Tzu Chi Medical School (present Tzu Chi University) operated by a Buddhist foundation. However, the shortage of cadavers still remains unsolved.

Body donation in Japan is an excellent practice that has no counterparts in the world. We have an ideal education environment, in which students can perform dissection using the abundant supply of cadavers filled with the love of body donors and their families. This is the fruit of the efforts made by body donors and university personnel that have supported the body donation movement, as well as the understanding and support of the public. Anatomists in Japan are also fully responding to such efforts. While anatomists in the United States and Europe tend to focus on biological study and stay away from education in anatomy, those in Japan are keeping the balance between education and research and accomplishing considerable achievements in both aspects.

While plastinated specimens have great educational value, importation of plastinated speci-
mens produced in other countries can be a form of cadaver trade unless certain restraints are used. It is difficult to produce plastinated specimens in Japan, because body donors are not ready to agree on such use of their bodies.

Towards the Future of Anatomy Education and the Body Donation Movement

Even if body donation and anatomy education in present day Japan are praiseworthy, there are many difficult problems to be solved for the future. The support and understanding of the medical community and the public are still required.

The first problem is the scarcity of young anatomists who are to support the education and research in anatomy. This problem is not unique to anatomy, but is shared by all fields of basic medical sciences. However, the training of anatomists is not a matter of learning techniques from manuals, and it depends more heavily on the accumulation of experience than that in other fields. In operating a cadaver dissection course, one need not only perform dissection in the dissection lab, but must also deal with various delicate tasks, such as communicating with persons registering for body donation, responding to the family and receiving the body, applying preservative treatment to the body, conducting memorial services and body donors’ meetings, and returning the ashes to families. Experience is also important in such peripheral tasks.

The second problem is the rapid destabilization of the education and research environment at universities, which is further complicating the situation. The working budget is compressed, and researchers are encouraged to acquire competitive research funds. The conversion of public and national universities to independent administrative institutions also resulted in the tightening of the budget. It is virtually impossible to take the first step of a research program using a university’s own research funds.

Much of the time and labor of anatomists are spent on education in the cadaver dissection course, leaving very little for research. In addition, although anatomical studies are quoted in other works over a long period of time and their influence is widespread, they are disadvantaged in terms of the impact factor and the effectiveness in raising research funds. There is a clearly growing tendency that the appointment of new professors is made based on the volume of research achievements and the ability to raise research funds. In the present environment, researchers in basic medical sciences are hard pressed to produce immediate results in research, giving up education. This is a result of the competitive principle working only in the aspect of research achievements, which are easy to evaluate objectively. On the other hand, objective evaluation is difficult in the aspect of education, including the character development of medical students. In the face of this reality, anatomists supporting anatomy education are increasingly becoming wary of making efforts.

The third problem in anatomy education is the presence of many risks, which are inseparably related to educational effects. Prevention of infection from bodies before preservative treatment, protection of students and teaching staff against the health hazard of formalin from cadavers, emotional conflicts with body donors and their families, judgment about cadaver dissection courses for co-medical students, imprudent comments on cadaver dissection incited by mass media, and many other issues need to be addressed. Precautions are used to prevent each of these, but measures to minimize damage after the occurrence of an accident must also be provided.

Above all, it is important that all people in the university recognize the significance of cadaver dissection and the many risks associated with it, understand the mental and physical efforts made by the anatomy staff and the time spent by them, and provide mental and physical support to anatomy education. Without being cynical, I would say that the largest challenge for anatomists at present might be obtaining the understanding and cooperation of the university administration.

Concluding Remarks

Finally, I would like to add a few words about the body donation movement. Tokushi Kaibo Zenkoku Rengokai has been supported by cooperation from the national government, various associations in medicine and dentistry, local governments, and other organizations. At the general meeting held every year, speeches are given by the President of the Japanese Medical
Association and the President of the Medical Association in the area. Nihon Tokushi Kentai Kyokai receives a subsidy from the Japanese Medical Association every year. For 20 years, the Nippon Foundation provided an extraordinary sum of subsidy, as much as 100 million yen (870,000 US dollars) in total, but partly due to the financial condition of the Nippon Foundation, this grant was terminated ending with the payment in 2005. As a result, our PR materials that have been distributed free of charge now need to be purchased at cost.

The body donation movement and anatomy education are the foundation of the high level of ethics developed through medical education in Japan. I sincerely ask all people in universities and medical institutions for their further understanding and support of the body donation movement and anatomy education.

<Contact Related to Body Donation>
Tokushi Kaibo Zenkoku Rengokai and Nihon Tokushi Kentai Kyokai
Room #404, Famil Nishi-shinjuku,
3-3-23 Nishi-shinjuku, Shinjuku-ku,
Tokyo 160-0023, Japan
Phone: +81-3-3345-8498, Fax: +81-3-3349-1244
Website: http://www.kentai.or.jp/
E-mail: info@kentai.or.jp

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