MEDICO-LEGAL CONSIDERATIONS IN ORGAN TRANSPLANTS

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Advances in medicine brings in its train many ethical and legal problems. The exciting and impressive developments in human organ transplantation have created several new problems. In transplantation with organs from living donors, the question of consent has to be reconsidered. In transplantation with cadaver material, the organ has to be removed within minutes of death. This has stimulated a careful re-appraisal what constitutes death, and has emphasised the profound difference between death of a person and biological concepts of the loss of property of living matter, and has brought the question of the law in regard to dead bodies well into the public eye.

In the human body, failure or loss of a part can sometimes be replaced by a transplant.

Transplants can be divided into three groups (Ciba. 1966):—

1. *Autotransplants*, i.e. tissues or organs transplanted from one part of the body to another part in the same patient. Autotransplants of skin, cartilage, tendon and bone are widely used in plastic and orthopaedic surgery.

   The medico-legal aspects would be the same as those in any operation, mainly the problems of negligence and consent.

2. *Heterotransplants*, i.e. transplants from an animal to man. The medico-legal aspects would not be different from those in any other operations.

3. *Homotransplants*, i.e. transplants from one human to another.

The possible sources of homotransplants are, namely:—

(a) Organs and tissues removed during the course of an ordinary operation ("free transplants").
(b) From living donors.
(c) From cadavers.

The use of "free transplants" does not raise any ethical or legal problem.

A living donor can only donate one of his paired organs, and the problems concern the legality of the surgeon's action in removing the organ.

In using cadavers, the proper and legal removal of an organ in circumstances providing maximal viability for its transplantation poses many difficult legal and ethical problems.

LIVING DONORS

In living donors there is the problem of consent. Why is consent necessary? The tort of trespass to the person protects the individual from any direct interference with his person. A doctor acting without the consent of his patient (or the person with a legal right to consent on his behalf) may be made civilly liable in tort. If the patient has undergone pain and suffering and has been deprived of an organ as the result of an unauthorised operation he will be able to recover substantial damages. The surgeon may also be guilty of the crimes of assault and battery and be subject to punishment by fine or imprisonment.

What is consent? "Consent means an active will in the mind of a person to permit the doing of the act complained of, and knowledge of what is to be done, or of the nature of the act that is being done, is essential to a consent to the act." Lock (1872) L.R. 2 C.C.R. 10, 11. When a patient permits a surgeon to invade his rights (e.g. to operate on his body) and voluntarily assumes the risk of injury, he has no action against the surgeon if what he has agreed to come to pass. But the Courts will not deprive a man of his rights unless they are satisfied that he has given them away. They want to be sure that the consent has been given freely. For a consent to be legally valid certain conditions have to be fulfilled:—

(a) The patient must have the legal capacity to give a valid consent taking into consideration his age, mental capacity and marital status.
(b) The patient knows what he is consenting to, i.e. he has knowledge of the nature of the procedure and the extent of the risk of harm.
(c) The consent is granted freely without coercion, fraud or misrepresentation.
(d) The consent given covers the acts of the surgeon, i.e. the consent has not been exceeded.

Parents can give consent for operation on behalf of their children who are minors. This authority is a corollary of the responsibility placed upon them by the law to look after the welfare of their children and exists only for the protection and well-being of the children. The parent has to weigh the risks and hazards of a proposed procedure against the consequences of foregoing the operation, and decide what course of action will be taken, i.e. decide what risks the child will undertake.

A difficult problem arises where the child is not old enough to give consent and the operation is not directly for the child's benefit. Can parents give consent for their child to donate a kidney to its identical twin? Would this be for the child's benefit? In the mid-fifties in Massachusetts, there were three boys aged 19, 14 and 14 who were prepared each to give a kidney to a dying twin brother. The Courts were asked to give a declaratory judgement on the lawfulness of the operation. Psychiatrists testified that the donors were fully aware of the nature of the operation; and that if the operation was not performed and the sick twin were to die, there would be a grave emotional impact on the surviving twin. The Courts ruled that the operation was of benefit to the live donor.

It is doubtful whether submitting a healthy child to such risk is for the good of the child. Parents may be free to become martyrs themselves, but can they make martyrs of their children?

What of the criminal law and consent? The security of a man's person is protected by the criminal law. Intentional use of force against the person of another is a crime. But under certain circumstances the law allows a man to consent to the use of a reasonable degree of force on his person, and this consent is a good defence to criminal liability, e.g. in a surgical operation. If, however, the act is in itself unlawful, i.e. it is an offence under the criminal law, consent is not a defence. "No person can license another to commit a crime" (R. v. Donovan (1934) 2 K.B. 498), (See Section 91 of the Penal Code).

Sections 87-92 of the Singapore Penal Code deal with consent in criminal law, and Sections 319-326 with the offences of causing "Hurt" and "Grievous Hurt".

From a study of the above-mentioned sections of the Penal Code, it will be apparent that the problem is whether removal of an organ from a healthy person is for his "benefit" thus making his consent for operation a good defence to criminal liability, or whether it is an unlawful act of voluntarily causing "hurt" or "grievous hurt". A surgeon cannot escape the penalty for performing an unlawful act by arguing that the patient had consented to, or even requested the operation. If the patient were to die, the surgeon would be answerable for culpable homicide.

TRANSPLANTS OF ORGANS FROM CADAVERS

The essential legal problem in the use of organs from cadavers, as with their transplantation from living donors, concerns proper authorisation and consent. Cadavers are the main source of organs for transplantation; but in using cadavers, the removal of organs has to be carried out as soon as possible after death to prevent irreversible damage caused by cessation of oxygen supply. This necessity for speed further complicates the consent problem. All this has focussed attention on the subject of dead bodies, and on the rights, duties and obligations which attach to their disposal.

The law of dead bodies is imperfectly developed. According to the common law there are no property rights in dead bodies and a person cannot by will or otherwise legally dispose of his body after death. Any direction on the matter that he may have given are subsequently not binding upon his personal representatives. Certain persons, e.g. spouses, parents, children and next of kin, however, have the right of possession for purposes of burial. The law recognises as incidental to the duty to dispose of the body the rights to the possession of the body until it is disposed of. Public interest may supercede the private control of corpses, e.g. for the protection of public health or the discovery of crime (Halsbury, 1959).

In the absence of specific legislation authorising testamentary disposition of the donor's body, the legal effect of an ante-mortem consent is open to question. There may also be civil and criminal liability for mutiliating a corpse.

In the United Kingdom, the Human Tissues Act, 1961, made some modification and clarification of the common law respecting dead bodies. In Singapore, the Medical (Therapy, Education and Research) Act 1965 is based on the English statute.

The Singapore Act will be discussed in some detail.

The Medical Act 1965 makes provisions for the use of parts of bodies of dead persons for therapeutic, educational and research purposes. There are certain practical difficulties in interpreting the provisions of the Act (as with the Human Tissues Act). These are discussed below —the clauses in the Act are in italics.

The consent of the deceased under the Medical Act 1965 is not a testamentary disposition. It is a mere consent which does not have to be complied with. The Act makes it plain that the formalities of a will are not required.

"SECTION 2

If any person, either in writing at any time or orally in the presence of two or more witnesses during his last illness, has expressed a request that his body or any specified part of his body be used after his death for therapeutic purposes or for purposes of medical education or research, *the person who has lawful possession of his body* after his death may unless he has reason to believe—

(a) that the request was subsequently withdrawn; or

(b) that the surviving spouse or *any surviving relative* of the deceased objects to the body being so dealt with

authorise in writing the removal from the body of any part or, as the case may be, the specified part, for use in accordance with the request.

SECTION 3

Without prejudice to the provisions of Section 2, *the person who is in lawful possession of the body* of a deceased person may authorise in writing—

(a) the use of the body or any specified part of the body for therapeutic purposes or for purposes of medical education or research; or

(b) .....

if, having made such enquiries as may be practicable, he has no reason to believe—

(i) that the deceased had expressed an objection to his body being so dealt with after his death, and had not withdrawn it; or

(ii) that the surviving spouse or *any surviving relative* of the deceased objects to the body being so dealt with.

SECTION 6

(1) Subject to the provisions of Subsection (3), the removal and use of any part of a body . . . . . in accordance with an authorisation under the provisions of Section 2, 3 or 4, as the case may be, shall be lawful.

(2) Such authorisation shall not be questioned or challenged in any court.

(3) No such removal . . . . . shall be effected, except—

(a) by a registered medical practitioner, who shall have satisfied himself by *personal examination* of the body that *life is extinct*;

(b) with the written *consent of the Coroner* in a case where an inquest or inquiry is to be held in respect of the death of any person.

SECTION 7

No person, who has been entrusted with the body for the purpose of its interment or cremation, shall give an authorisation under the provisions of Section 2 or 3."

In Sections 2 and 3, it is stated that "*the person who is in lawful possession of his body after his death*" has authority under certain circumstances to give consent. But who this person is, is not defined anywhere in the Act. If any tissue or organ of a deceased person is to be used for therapeutic purposes it must be removed from the body within a short time after death, and it is therefore of importance to determine who is in a position to authorise the removal of the part concerned. The only decided case on this point is Williams v. Williams (1882) 20 Ch. D. 659, per Kay L. J. at 664 where it was held that an executor is in lawful possession of the body of the deceased testator.

Since not everybody makes a will, it is obvious that some other person may in the circumstances of a particular case be in lawful possession of a body. But the law is not clear on this point. Certain conclusions may be drawn from a study of decided cases; from the provisions of the Registration of Births and Deaths Ordinance and the Rules made under it; the Burial Grounds Bylaws and the Cremation Bylaws.

In Ambrose v. Kerrison (1851) 10 C.B. 776, and Bradshaw v. Bears (1862) 12 C.B.N.S. 344, it was recognised to be the duty of the husband of a dead woman to dispose of her body; and in R. v. Vann (1851) 2 Den. 325, to be the duty of a parent to dispose of the dead body of a deceased child; while in R.v. Stewart (1840) 12 Ad. and El.

773, it was held that a householder in whose house there was a dead body was bound to inter it.

The Registration of Births and Deaths Ordinance 1938, Sections 13(1) and 13(2) specify the persons who are under a duty to give information of a death to the Registrar or his deputy. And under the Rules made under the Ordinance, after registering the death, the Deputy Registrar issues a Burial Permit without which, under the Burial Grounds Bylaws 1908, no body may be interred. The Cremation Bylaws 1961 recognise that only certain persons can apply for cremation of a corpse.

From a consideration of the above, when a person dies the duty to dispose of the body attaches to certain persons. It is submitted that the person lawfully in possession of a body is the person on whom falls the duty of disposing of the body, as presumably there can be no disposal without prior lawful possession.

The view is clearly borne out by Section 7 of the Medical Act 1965 which prohibits the giving of any authority under the Act by a person entrusted with the body for the purpose only of its interment or cremation, without which prohibition an undertaker could give such authority.

There may however be considerable difficulties in determining in a particular case who has the lawful possession of the body.

Presumably this person will be the nearest relative (if one can be so designated), e.g. the spouse, who will decide on the burial arrangements.

It is noteworthy that under Subsection 7 of the Human Tissues Act 1961, in the case of a death in a hospital, nursing home or other institution, the management authorities can give the necessary authorisation. This interpretation however is disputed. Since the hospital authorities cannot direct how and where a body is to be buried, except in the exceptional case, the hospital where a patient died is not lawfully in possession of the body for the purposes of the Act (Addison, 1968).

The Singapore Act has no such provision regarding hospitals except in the case of bodies unclaimed twenty four hours after death (Section 4). Organs from such bodies are not suitable for transplantation.

In New Zealand, the Medical Act 1908, was amended by the Medical Amendment Act 1954. A few sections were added to the original statute to allow removal of healthy tissue for therapeutic purposes. The law is similar to the English and Singapore ones, but one of the new Sections, namely 24(2) declares that certain persons shall be deemed to be persons lawfully in possession of bodies in institutions (e.g. hospitals) in specified instances.

Sections 2 and 3 of the Medical Act 1965 also have this clause "*any surviving relative*". It has not been decided what the word "relative" means in this context. There is no statutory definition. Judicially the word has usually been taken to mean only those related by blood. The term "relative" as used in wills is confined generally to blood relations, and in the Act the term "relative" would most likely have the same meaning. As it is, "any surviving relative" would mean that very many people can raise objections.

By comparison with the Human Tissues Act 1961, the "relatives" under the Singapore Medical Act 1965, have greater powers of veto. Under the Human Tissues Act, relatives can veto only when the person in lawful possession of the body acts of his own volition. They cannot veto if the deceased had expressed a request that his body be used for the purposes specified in the Act. Under the Singapore Act, the relatives can object if the person in lawful possession of the body wishes to act of his own volition, and also if the deceased had expressed a request that his body be used for therapeutic purposes or for the purposes of medical education or research. Of course, under the Human Tissues Act, if the objecting relative happens to be the person lawfully in possession of the body he may nullify the deceased's properly expressed wish simply by inactivity, there being no duty laid on him by the Act. Similarly, the Medical Act 1965 in Singapore only authorises, but does not require the person lawfully in possession of the body to carry out the deceased's request.

The law has always been careful of the natural sentiments respecting dead relatives. This is exemplified in the English statutes—the Anatomy Act 1832, the Corneal Grafting Act 1952 and the Human Tissues Act 1961—and also in the Singapore Medical (Therapy, Education and Research) Act 1965, where the clause "the surviving spouse or any surviving relative objects to the body being so dealt with" is written into the law.

There is no right of property, in a commercial sense, in the dead body, and after burial the body becomes part and parcel of the ground to which it is committed. But the right to bury a

corpse, and to receive it in the same condition in which death leaves it, is a right which the Courts recognise and protect.

What are the consequences of unauthorised removal of organs from the dead?

This unlawful act is both a crime and a tort. Section 297 of the Penal Code reads as follows:

"Whoever, with the intention of wounding the feelings of any person.....or with the knowledge that the feelings of any person are likely to be wounded.....offers any indignity to any human corpse.....shall be punished with imprisonment for a term which may extend to one year, or with fine or with both."

Clerk and Lindsell on Torts (11th Ed.) p. 499, states, "In the dead body of a human being there is no property, but the executor or administrator of the deceased or other persons charged by the law with the duty of interring the body have the right to the custody and possession of it until it is properly buried. Any violation of that right to possession, such as an unauthorised post-mortem examination, is a trespass for which an action lies."

Section 6(3) of the Medical Act 1965 states ".....a registered medical practitioner who shall have satisfied himself by *personal examination* of the body that life is extinct."

For centuries, the medical profession has defined death as the "apparent extinction of life as manifested by the absence of heart beat and respiration", and the doctor had no difficulty in satisfying himself by personal examination that life is extinct. Today modern techniques in resuscitating and maintaining respiration and circulation have cast doubts on permanent cessation of respiration and circulation as signs which signal the point of no return, and uncertainty sometimes exists as to when a person is dead. But it is important to define the moment of death so that (a) one can decide what legal principles governing the removal of an organ from a human body to apply—those pertaining to a living person or those pertaining to a corpse; and (b) removal of an organ, when legally permissible, may proceed with all possible speed.

The law has hitherto made no effort to define "death" and the "moment of death". The Courts will decide in each case whether or not a man is dead upon the expert medical evidence which is given. The standard criteria used by the medical profession may be inadequate in cases where (a) though death has apparently taken place as judged by the cessation of respiration and circulation, life has been restored by modern resuscitation methods (sometimes with permanent residual brain damage), and (b) where irreversible damage to the brain may exist even though circulation and respiration continue naturally or artificially.

How then can death be recognised? How can one distinguish 'life' from the 'signs of life' which can nowadays be artificially maintained? Can the moment of death be defined as precisely as possible by equally modern techniques so that one can relieve the patient of organs which are essential to life?

The problem is essentially that of a patient who is a "hopeless case" and is "kept alive" artificially by a machine for some greater or less period, at the end of which time the use of the apparatus is discontinued.

A hypothetical case will demonstrate the medico-legal problems (Elliot, 1964).

P, after receiving severe injuries in a brawl, reaches this hopeless state on the 1st of the month, and is connected to a respirator. On the 2nd, the surgeon obtains the consent of P's wife to remove one of P's organs which is needed for transplantation into another critically ill patient. The surgeon removes the organ on the 3rd of the month then discontinues the use of the respirator, and P's heart and respiration cease. Did P die on the 1st or the 3rd of the month?

There are only two possible choices for the "moment of death". One when the "hopeless position" is reached, and the other when the apparatus is discontinued.

One school of thought in the medical profession believes that death must now be defined only in terms of irreversible destruction of the vital centres of the brain. On this approach, a person with brain damage of this severity is "dead" even before his heart and lungs have stopped functioning, or when though they have ceased functioning they are resuscitated and function artificially (In the hypothetical case mentioned above, P would be regarded as having died on the 1st of the month). Therefore the doctors who stop resuscitation do not cause a break in the chain of causation between the original wrongful act and death. It also precludes any possibility of these doctors being held themselves to have caused death. But this approach is not without problems? Would a person who stabs the patient through the heart while resuscitation is going on be innocent of causing death? There is also the great moral and

ethical problem of keeping the respiration and circulation going until a convenient moment when parts can be removed to put into a suitable recipient.

Other doctors consider that death only occurs at the moment when resuscitation is abandoned because no progress is being made and life slips away (In the hypothetical case, P is regarded as having died on the 3rd of the month). This approach, while in many ways preferable, also poses several problems:—

(a) When do the doctors give up hope and abandon resuscitation?

(b) In the hypothetical case, the removal of the organ was unlawful without P's consent. His consent cannot be implied since the removal was of no therapeutic value to him, and the defence of "necessity" cannot be pleaded to justify this action.

(c) For the same reason, his wife's consent was not valid for the purpose of rendering the removal lawful; its only effect (if made with knowledge of all the circumstances) is to make the wife a party to the unlawful act.

(d) No protection is afforded by Section 6(2) the Medical Act 1965, for Section 6(3) states that removal must be by a registered medical practitioner, who shall have satisfied himself by personal examination of the body that life is extinct (The organ was removed on the 1st).

This unlawful act is both a crime and a tort.

(e) Does the action of the doctors, who stop resuscitation and transplant organs, operate as a novus actus interveniens which releases the person who originally caused the injury from liability for homicide? An English Court apparently gave an affirmative answer in 1963. In Potters' case (B.M.J., 1963), his assailant was indicted for manslaughter, and although there is no law report on the case, Elliot (1964) and Simpson (1967) report that the charge of manslaughter failed and the assailant was convicted for common assault. The defending counsel argued successfully that the removal of the kidney was a more direct and immediate cause of death. In R. v. Jordan (1956) 40 Cr. App. R. 152, the deceased had been stabbed and died following a penetrating abdominal wound. The defence submitted that the death was caused by medical maltreatment in that there was a mistaken administration of antibiotics and intravenous fluid. The conviction was quashed by the Court of Criminal Appeal. According to that decision, death resulting from any normal treatment employed to deal with a felonious injury may be regarded as caused by the felonious injury, but death following medical maltreatment is not attributable to the assailant.

(f) Are the doctors guilty of homicide themselves? To hasten the death of a person whose death (through sickness or previous injury) is inevitable is homicide in law. It is a question of fact whether death was caused by the previous sickness or injury or by the latter action of stopping resuscitation and removing organs.

It has been suggested (Fletcher, 1967) that the act of stopping resuscitation should not be considered as a "positive" act causing death, but as a "negative" one of permitting death to occur. The argument is as follows—that a doctor may not kill is an application of the general principle that no man may kill a fellow human being. In contrast, the principle that a doctor may not omit to render aid to his patient is a function of the special relationship that exists between doctor and patient. He will be liable only for omitting to do that which he is under a legal obligation to do because not all omissions are illegal. The doctor's duty to prolong life is a function of his relationship with his patient. In the typical case, the patient expects his doctor to act in his best interest. Those expectations, in turn, depend on the practices prevailing at the time, and since it is customary and not unethical medical practice to terminate a completely pointless and artificial prolongation of the "vegetative existence" of a doomed man, the doctor's action in turning off the respirator should not be considered as an act to kill.

This approach, i.e. to consider a person dead only when resuscitation stops, gives the doctors who can artificially prolong "life" far-reaching powers to control consequences hinging on the moment of death. To name just a few: the devolution of an estate, estate duties and life insurance. Society may not agree to this.

There is yet another pertinent problem. If death occurs only when the resuscitation

attempts have failed, can a person be certified dead if no attempts have been made to resuscitate him? Are we going to have two standards for certifying death—one for those who die "naturally", and one for those who die when hopes of resuscitation are abandoned?

Section 6(3)(b) states that ".....with the written consent of *the Coroner* in a case where an inquest is to be held in respect of the death of any person."

Since the majority of suitable donors would be healthy young persons who have sustained severe brain injuries, this is another difficulty which will have to be overcome. The Coroner has no jurisdiction until a person is dead, and it is doubtful if he can give prior authorisation in a case where an inquest or inquiry may be held. He would, if cooperative, have to be standing by with the medical team to give his consent the moment the patient is pronounced dead in order that the organs may be removed as soon as possible. He may be quite chary of this as the removal of organs can obscure signs of forensic importance.

From the above discussion, it is obvious that (a) the problem of deciding when life is extinct in patients on artificial aids and its associated legal problems have yet to be solved, and (b) the existing law in Singapore is inadequate for transplantation purposes.

What then can be done to ensure that life is extinct before organs are removed? It is important to allay both professional and public anxiety on this matter. There is much to be said for the entire care of the potential donor being in the hands of doctors who are not members of the transplant team.

It has been suggested that the determination of death is no longer a purely medical matter, and that it has become in part a social one which Parliament and the Courts will have to resolve. It is submitted that the determination of what constitutes death is the responsibility of the doctor and should always remain so. The World Medical Association (1968) in the Declaration of Sydney is of this opinion. Death is the irreversible cessation of all of the following: total cerebral function; spontaneous function of the respiratory system; and spontaneous function of the circulatory system. Its determination will be based on clinical judgement, e.g. absent reflexes, the inability of the patient to start a spontaneous heart beat and respiration upon withdrawal of the artificial means of sustenance, supplemented if necessary by a number of diagnostic aids, e.g. the electroencephalograph (E.E.G.).

Hamlin (1964) has proposed a set of conditions for certifying death in association with cardiorespiratory activity sustained by mechanical aids:—

1. No spontaneous respiration for a minimum of 60 minutes.
2. No reflex response (superficial, deep, organic, etc.). No change in heart rate on ocular or carotid sinus pressure.
3. E.E.G. Flat lines with no rhythms in any lead for at least 60 minutes of continuous recording. No E.E.G. response to auditory or somatic stimuli or to electrical stimulation. Two longer periods of total flat recording some hours apart may be preferred by some.
4. Normal basic laboratory data including electrolyte pattern.
5. Share responsibility for pronouncement of death with other colleagues.

Alexandre (1966) lists these five conditions:—

1. Complete bilateral mydriasis.
2. Complete absence of reflexes, both natural and in response to profound pain.
3. Complete absence of spontaneous respiration, five minutes after mechanical respiration has been stopped.
4. Falling blood pressure, necessitating increasing amounts of vaso-pressor drugs.
5. A flat E.E.G.

In addition to these five criteria, Revillard (1966) includes two others, namely (1) interruption of blood flow in the brain as judged by angiography, and (2) the absence of reaction to atropine.

Rosoff and Schwab (1967) adopt a combination of three criteria to establish irreversible brain function, namely, a flat E.E.G., absent spontaneous respiration and absent reflexes of any type, all co-existing for a 24-hour period.

Moore (1968) insists that in cases of brain injury, there must be gross anatomical damage visible on physical examination, by craniotomy or by angiography.

These extraordinary standards are necessary to protect the rights of prospective donors and to allay professional and public anxiety. But once death has been clearly established it would seem pointless to prolong "life" by wholly unnatural means.

How can the law in Singapore be amended to make it less restrictive and more in line with modern medical advances and yet not diminish the protection which it confers on the prospective donor and the feelings of the bereaved family? A host of related legal problems will also have to be solved.

A study of how other countries have attempted to overcome the medico-legal problems associated with organ transplantation may serve as a guide for new legislation which will be required.

In England, the Renal Transplantation Bill (B.M.J., 1968) was introduced early in 1968 to allow easier access to donor material. Its short title is "An Act to permit removal from the body of a human person, duly certified as dead, any kidney or kidneys required for medical purposes, unless there is reason to believe that the deceased during his lifetime had instructed otherwise." The Human Tissues Act is considered too restrictive and this Bill sought to dispense with the need for consent of the relatives, leaving it to objectors to make their views known in advance. The Bill did not become law.

The Conference on Transplantation of Organs in London (B.M.J., 1968) agreed that no attempt should be made to lay down a legal definition of death or rules which doctors should observe in reaching what should be a clinical decision; but that to allay disquiet vital organs should not be removed until spontaneous vital functions had ceased and two doctors, each independent of the transplantation team, and one of them at least five years qualified, had certified that this condition was irreversible.

The Conference reaffirmed that it would be necessary to relax the requirements as to consultation with relatives contained in s. 1(2) of the Human Tissues Act. If neither the deceased nor his next of kin had any objections, the views of other relatives need not be sought. If either the deceased or his next of kin were known to object that objection must be respected.

The developments concerning organ transplantation that have taken place in France are of great interest (France, 1947-1968). It started with legislation to allow removal of corneas, bones, nerves and blood vessels from cadavers.

In 1947 it was decreed that if a patient died in an approved hospital and if the Head of Department was of the opinion that an autopsy or removal of tissues was necessary for scientific or therapeutic purposes he could do so without the consent of the deceased's family. Only two conditions had to be fulfilled: (a) death had to be certified by two doctors using the criteria recognised by the Ministry of Health. In addition to clinical examination, arteriotomy, the fluorescine test, and the 'sign of ether' test had to be carried out. These tests were based on cessation of circulation; (b) a report had to be submitted stating the reasons and circumstances of the case.

Corneas however could be removed at the place of death if the patient had bequeathed his eyes.

In 1955, certain formalities in medico-legal cases were relaxed, provided a detailed report of the victim's injuries, the incisions made and the tissues removed was submitted to the forensic pathologist, and care was taken not to obscure details of forensic importance when removing tissues.

In 1968 further modifications were found necessary to facilitate organ transplantation. Circular No. 67 of 24.4.1968 stated that diagnostic methods based on the cessation of the heart and circulation are inadequate to diagnose death in a patient whose circulation and respiration are artificially maintained. New rules and criteria are recommended for such cases:—

1. Certification of death must be based on irreversible damage to the brain incompatible with life.
2. Death must be certified by two doctors, one of whom must be the Head of a Department (or his duly authorised substitute). When necessary, a third opinion must be obtained from a specialist in electroencephalography.
3. Irreversible damage to the brain incompatible with life is to be diagnosed only after a careful analysis of the history of the case; and when these signs are present:
   (a) No spontaneous respiration.
   (b) Absence of all reflexes; total hypotonia and complete mydriasis.
   (c) No E.E.G. waves even after stimulation for an adequate period of time in the patient who has not been subjected to hypothermia or taken sedatives.
4. Three copies of the death certificate to be made out, each of the doctors to keep a copy and the third to be kept in the hospital records.

5. Once this certificate is signed, it authorises the suspension of cardio-respiratory resuscitation measures.
6. Removal of organs is authorised only after death has been certified. But artificial measures need not be stopped immediately if this interferes with the perfusion of the organ to be removed.
7. A member of the transplantation team cannot be one of the doctors certifying death.

In the United States of America, the National Conference of Commissioners on Uniform State Laws started drafting the Uniform Anatomical Gift Act about three years ago (Stason, 1968). The Act attempts to deal with the problems connected with antemortem gifts for transplantation, problems which legislation must take into account. Briefly, the provisions of the Act deal with:—

1. *Who may make an anatomical gift to take effect after death*
   (a) The donor in his lifetime, assuming he possesses proper legal capacity.
   (b) The surviving relatives in a stated order of priority.
   (c) Certain other persons.

This provision takes into account the very limited time following death for the removal of organs and the desirability to eliminate all possible question by stating the rights of and the priorities among the survivors.

2. *To whom may a gift be made, and for what purpose*
3. *How the gift is executed*
4. *Delivery of the document*
5. *Provisions for revocation*

Careful provisions are made for revocatoin during the lifetime of the donor, taking into account of the possible change of the donor's wishes.

6. *Effect at and after death*

The time of death is to be determined by the patient's doctor. The gift is binding upon the relatives and the donee may accept or reject the gift and civil liability is precluded if he acts in good faith and reliance upon the evidence of the gift without notice of revocation.

Subjects not covered by the Uniform Act

1. *Payment for the gift*
2. *Time of death*

This matter calls for professional medical judgement of a high order to cope with the complex medical circumstances of each case. The Act merely provides that the doctor in charge of the donor shall assume the responsibility of determining when life is at an end, and that he should not in any way be associated with the transplantation. The law cannot and should not attempt to do more.

3. *Who gets the parts (i.e. the recipient)*

This difficult problem is left for the medical profession to solve.

The legal provisions which made organ transplantation possible in South Africa will now be studied (Shapiro, 1967). In South Africa, the Post-Mortem Examinations and Removal of Tissues Act 1952 provides for "the post-mortem examination of certain human bodies, for the removal from human bodies of tissue for therapeutic or scientific purposes, and for the preservation and use of such tissue." The Act distinguishes the removal of tissue (any human flesh, organ, bone or bodily fluid) from bodies of deceased persons, and that of removal from living persons.

Removal of tissue from bodies of certain deceased persons

Section 2(2) authorises the removal of tissue if the magistrate or medical practitioner concerned is satisfied that—"(a) The body is that of a person: (i) who either in the presence of at least two witnesses before his death or in his last will has left his body for therapeutic or scientific purposes; *or* (ii) whose surviving spouse or nearest *available* adult relative or, if no such relative is available, any bona fide *friend* of the deceased consents in writing to the grant of such authority,"

and that the body is no longer required for examination in accordance with certain provisions of the law, e.g. inquests, infectious diseases. Attention is drawn to the clauses "nearest available adult relative" and "any bona fide friend."

Removal of tissue from living persons

Sections 3 and 5(b) authorise the removal of tissue where (a) it is replaceable by natural processes of repair, and (b) where the removal is in the interest of the patient. In these cases, all that is required is the valid consent of the patient or of the person who can consent on his behalf. The law is similar in Singapore.

Section 3 further permits removal for medical or scientific purposes of naturally irreplaceable

tissue from the body of a living person when the removal is not required in the interests of the health of that person provided (a) two medical practitioners certify in writing that removal of the tissue would not prejudice that person in any way, and (b) the person concerned consents in writing to the removal of the tissue.

This section can be interpreted differently by different doctors, and whether a donor is prejudiced if one of his paired organs is removed depends on the criteria adopted.

In conclusion, it is emphasised again that the existing law in Singapore is inadequate for transplantation purposes. Amendments in the law, however, must not undermine the public's confidence in the traditional medical ethical standards which insist that a doctor's obligation is towards his patient and that he should treat his patient to the best of his ability.

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