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POINT OF VIEW

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Some contemporary ethical considerations related to organ transplantation

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Abstract With the increasing number of transplantable organs and tissues, as well as improvements in transplantation results, has come a severe shortage of organ donors. Consequently, new ethical dilemmas, related to the fair allocation of available organs and the use of alternative sources of donor organs, are of growing concern. Establishing fair allocation priorities is a serious problem in organ transplantation. Ethically, they should be defined by society as a whole rather than exclusively by the medical profession. Proposed solutions for the organ donor shortage, each with their unique ethical constraints, include the use of related donors, partial organ transplantation, cell transplantation using fetal tissue, and the use of animal organs („xenotransplantation"). Commercial trading in donor organs must be regarded as an unethical activity rather than an ethical dilemma since the donors are motivated by monetary rather than by humanitarian reasons. These ethical dilemmas could be largely avoided by an effective reduction in the severe shortage of postmortal organ donations.

Key words Allocation, organs for transplantation · Transplantation, allocation · Ethics, transplantation, organ shortage · Organ shortage, ethics

In 1841, the American sailing ship William Brown, while en route from Liverpool to Philadelphia, drifted onto an iceberg just off the coast of Newfoundland. Its single lifeboat offered a very small chance of survival. It leaked and soon filled up with far more passengers than it could safely hold. Although the passengers worked throughout the night with buckets and pumps, the seawater continued to rise. By the light of dawn one thing was clear to everyone: unless the number of passengers was reduced by at least half, everyone would soon drown. Eventually, after some hesitation, the coxswain, in desperation, ordered the sailors to throw 14 passengers overboard to their certain deaths in the ice-cold sea, to the horror of the other passengers.

One hundred fifty years later, we are faced with a similar ethical dilemma that is also related to a life-saving procedure, namely, organ transplantation. This ethical dilemma is unique in the annals of medical science since it is related not to the performance of a medical procedure per se but to the overwhelming success of the procedure.

Ethical constraints are inevitably linked to organ donation and transplantation. These activities are subject to regular and fairly penetrating attention from the media. The issues receiving attention are almost always closely linked to their ethical aspects, e. g., setting a maximum age for potential organ recipients or legislative constraints on a particular aspect of organ transplantation.

Continual developments in the field of organ transplantation, i. e., immunosuppressive therapy and organ preservation, leading to the ever-increasing success of, and possibilities for, transplantation, have led to an ever-increasing demand for donor organs. Unfortunately, these increases have not been followed by similar increases in the number of organ donors. The consequence of this shortage is that many patients remain on

waiting lists for transplantation for months or even years and, tragically, too many of them die while waiting. This situation leads to enormous ethical dilemmas: how to distribute the available organs, what methods to use to reduce the donor shortage and, finally, how to prevent the development of commercial trade in organs encouraged by this donor shortage. For whenever there is a distorted supply-demand ratio, there are always people who cleverly manage to use the situation to their own commercial advantage.

In the United States, it has been suggested that the next of kin be paid a sum of money to cover funeral costs if they agree to organ donation [11], the underlying motive being, of course, to persuade people to allow their relatives' organs to be removed and used for transplantation purposes. This idea is, however, not really new. Funeral costs have long been covered in cases where a body has been made available for medical research purposes. However, the consequence of such measures will surely be that people in a financially weak position will agree to organ donation not for humanitarian but for financial reasons. It is, indeed, questionable as to whether this is the proper way to solve the great organ shortage. In any case, it is highly unlikely that a solution will be found in the near future. The discrepancy between supply and demand will continue to leave its mark on the distribution of organs among the increasing number of potential recipients.

In December 1990, a conference was held in Munich, Germany, on ethics, justice and commerce in organ replacement therapy. The problems that were addressed at that meeting still confront us. For that reason, we have decided to address some of them in the context of present-day conditions.

Allocation

The continuing shortage of donor organs confronts us with one of the greatest problems related to organ transplantation: allocation. Who decides which patient gets the available organ? Most people agree that doctors should decide, their argument being that, on the basis of medical criteria, doctors are in the best position to determine which organ should be allocated to which patient. This is, however, only partly true, for if, for example, one heart is available, there are almost always several patients on the current waiting list who can all be shown to qualify equally and simultaneously for that one heart. Which patient should then be chosen, and what criteria should be used to make this decision? Can such a decision be made purely on the basis of medical criteria? What other factors should be taken into account? The core principle of the Hippocratic tradition commits the physician to place the health of his patient as his first moral priority, but this principle is inadequate when it comes to transplantation.

The distribution of organs does not depend solely on medical factors. Many nonmedical factors also play an important role, such as equal opportunities, compassion, justice, etc. Medical criteria must be considered in combination with nonmedical ones. Obviously, a doctor will tend to seek what is best for his own patient, and this could lead to an unfair or incorrect organ distribution that would adversely affect other patients. Would it not be more fitting, from an ethical point of view, if all members of society were involved in this discussion instead of leaving the decisions solely in the hands of the medical profession? Even if this were the case, which criteria should be considered when allocating an organ? The choice is, indeed, a difficult one. The following four approaches have been suggested:

1. The "life-saving principle": the organ is given to the person who needs it the most urgently. This is a purely medical decision where patients in the poorest state of health have the highest priority.
2. "First come, first served": the organ is allocated to the recipient who has been waiting the longest. This would appear to be the fairest way.
3. Optimal usage of the donor organ: priority is given to the patient whose transplantation is expected to be the most successful.
4. A random lottery: a lottery is held in which the medical and psychosocial status of the recipient is not considered at all. Such a practice is seldom applied and would certainly not be popular in the medical community.

Generally speaking, organ allocation takes place on three different levels. Firstly, there are the doctors and their patients. The doctors want their patients to get better as quickly as possible and, therefore, want to give them an organ that will save their lives or improve their quality of life. Secondly, there are the various transplantation centers which, although they are partners when it comes to the transfer of knowledge, become rivals when it comes to competing for available organs. And thirdly, there is the responsibility of politicians, e.g., with regard to determining a maximum age for potential transplant recipients or designating the maximum number of centres for transplantation. On a political level, decisions are often subject to budgetary constraints, which compounds the difficulty of allocation. Since this sometimes has direct consequences for a large group of people, it is likely to be influenced by public opinion.

The interest groups directly affected (i.e., potential transplant recipients and their families) naturally want to influence the distribution policies for donor organs. This clearly does not make it any easier for those directly involved in the organ allocation process. The system of

organ allocation differs greatly from one type of donor organ to another. For donor kidneys, one is confronted with the "conflict of interests" faced by dialysis doctors [14]. On the one hand, they want to encourage transplants for their kidney patients undergoing dialysis but, on the other hand, this then leads to a loss of income for them. Looking in particular at private dialysis centers, there is clear evidence that proportionally fewer patients from these centres are referred for transplantation than from public hospital centers. After all, the fewer patients there are undergoing dialysis, the less income there is for the center's medical and other personnel [12, 19].

The allocation problem for patients waiting for a heart transplant is completely different. In practice, patients referred for a heart transplant often die while on the waiting list, due to the shortage of donors. This is closely linked with the ethical problem that a patient with a good chance of being cured may die while on the waiting list because, at present, organs are often assigned to the clinically more urgent patient whose condition is unstable and who is, therefore, clearly less likely to survive while on the waiting list [13]. The development of mechanical support devices now makes it possible for some of these patients to survive while waiting for a transplant. Although the transplantation results were initially disappointing for these patients, their results are now improving [1]. An organ is found in time for just over half of this category of patients; yet, of these patients, less than half leave the hospital alive following transplantation. The poor medical status of these patients is thought to be the main contributing cause of failure of these transplants. This situation has led some of the medical specialists involved to increasingly wonder whether it would not be more responsible to implant the available donor hearts in patients with the best chance of survival.

The allocation of donor livers raises ethical problems that are similar to those encountered in heart transplantion. Here, too, the question arises as to who should receive an available liver: the patient who has been waiting the longest, the patient who has the best chance of success, or the patient with the most urgent need? Difficult questions like this are the order of the day. Imagine, for example, that there is a good donor liver available. Who is the most eligible candidate for the liver: the younger patient who urgently needs a liver due to acute fulminant hepatitis and who has good prospects for a healthy life following liver transplantation or an older patient with carcinoma of the liver, knowing that the results of liver transplantation in the latter case are often disappointing? Should we conclude that it is wiser from an ethical point of view to make the liver available to the recipient with the greatest chance of success? Is it ethically correct to make such a decision and to argue that if a liver or a heart transplant has a high chance of failure the organ should not be made available to that recipient? Or should the most urgent patient be entitled to the organ because the less urgent patient has the chance of another offer in the future? Who should have to make such decisions over the life and death of a fellow human being?

Living related transplantation

Transplanting a kidney from a patient's relative often provides an alternative to having to wait a long time for a suitable donor kidney. However, such donations are ethically acceptable only if both the recipient and the donor are well informed and have voluntarily made a conscious decision. In addition to reducing the waiting period, living related transplantation had advantages from an immunological point of view, since there is often a large degree of similarity between the tissue types of the donor and the recipient. The small risk of rejection leads to a larger chance of a successful transplant [9]. Ethical considerations regarding living related transplantation include, among other things, the question of whether it is right to deliberately harm one person in order to help another. In order to answer this question, it is necessary to balance the risk to the donor against the benefit for the recipient, whereby it should be emphasized once more that donation as an option is only considered on the basis of voluntarism and full information, "informed consent".

Many years of experience in kidney transplantation using related donor kidneys makes it evident that the quality of life of such kidney transplant recipients is greatly superior to that of dialysis patients and that the risk to the donors is almost nonexistent. In other forms of organ transplantation, this risk-benefit consideration needs to be examined from a completely different angle. Due to the shortage of organs, over the last few years research has been carried out, mainly in the United States, into living related transplantation with a section of liver, pancreas, lung, or small bowel. The distinctive feature here is that this method uses a portion of organs that still retain their function in the donor after partial resection. The risks to the donor from such donations are obviously far greater than the risks involved in a kidney donation. In Chicago, a study on partial liver transplantation has been conducted, inspired by a chronic shortage of livers, especially for small children [22]. More than 20 small children have been transplanted – almost all successfully – with the partial liver sample from a relative. The following prerequisites have been set for this type of liver donation:

1. The liver transplantation must have a good chance of success.
2. The risk to the donor must be minimal.

3. The donation should be voluntary.

In the case of liver donation by a relative, the concept of voluntarism in particular raises a number of questions. How voluntary is this donation when it concerns the life or death of your own child? In contrast to kidney donation, where the alternative is dialysis, in the case of a liver transplant the life of the young liver patient is at stake, and parents are under enormous emotional pressure when making a decision on liver donation. This pressure on the donor is made even greater by the fact that the partial removal of the liver carries far greater risks to the donor than the removal of a kidney. To what extent can we legitimately speak of a donation that is ethically sound on the strength of these risk-benefit considerations?

Currently, living related transplantation with a section of the liver is mainly being carried out in a few centres in Europe, Japan, and the United States, but with the long waiting lists and the shortage of donor livers, it is probably only a matter of time before the discussion on living related liver transplantation by partial resection finds its way to other parts of the world. Would it not be better to increase the opportunities for postmortem organ donation so that donations by members of the family are no longer necessary?

Another form of living related donation involves a section of the pancreas (usually in combination with one kidney). Unlike kidney transplantation, pancreas transplantation per se does not save lives, but it does contribute to a better quality of life for the diabetic patient. Research has shown that the best results are obtained in cases of combined kidney/pancreas transplants [8, 10, 17, 18]. The prerequisites are similar to those for living related kidney transplantation, namely, a close immunological match between donor and recipient. However, in closely related donor-recipient pairs like identical twins and HLA-identical siblings, graft failure caused by the recurrence of diabetes has been observed when no or low-dose immunosuppression protocols have been used [16]. The advantage of a shorter waiting period does not apply to living related pancreas transplantation as it does to kidney transplantation, as there is currently no real shortage of pancreases. The fact that not all of the pancreases available from organ donors are actually used for transplantation is more a problem of logistics than of immunology. The argument for pancreas transplantation is that the mortality rate of diabetics undergoing conventional insulin treatment is considerably higher than the mortality rate after a successful pancreas transplantation. The argument against living related pancreas transplantation is the fact that it remains a major surgical procedure and, as such, poses an increased risk of postoperative mortality to the donor. The long-term results of living related pancreas transplantation cannot yet be determined as our experience with it is still too limited.

Research is also being done on a much smaller scale into living related donation of a section of the lung [15]. A small number of partial lung transplants from parent to child have been performed. An even smaller number of transplants with a section of the small bowel have also taken place [2]. This form of transplantation is the only hope for patients with the small bowel syndrome, an illness that causes massive deterioration of the small bowel. Both the partial lung transplants and the partial small bowel transplants are still in too much of an experimental stage to enable one to draw any conclusions about their efficacy.

Future prospects

As if the ethical questions already posed were not enough, we would like to take a brief look into the future. What can we expect?

In worldwide attempts to find a solution for the shortage of donor organs, other donor sources and new transplantation methods are being explored. Although the possibility of using so-called nonheart-beating donors was introduced as long ago as 1980, that policy has not received the attention it deserves [4, 20]. Nonheart-beating donors are those whose cause of death is failure of their cardiopulmonary systems rather than brain death. The results of short and long-term studies on the survival of grafts obtained from these donors have shown a high degree of similarity with those obtained from heart-beating donors [21].

Research is currently being done into the possibility of cell transplantation with isolated cells from fetal tissue [5, 7]. The results to date are disappointing. The use of fetal tissue for transplantation raises several ethical questions, such as:

1. What is the position of the pregnant woman?
2. Who gives permission for the use of fetal tissue? Is it the woman?
3. Does the woman have a say in the choice of the recipient?

It seems that, for the moment, the use of fetal tissue should be permissible where it has been shown to be effective, provided certain rules are applied to prevent improper use (such as commercial use or elective abortion).

Research has also been carried out for many years on the use of animal organs (e.g., from pigs and monkeys) for transplantation purposes, so-called xenotransplantation [3]. The idea here is to implant animal organs in order to keep patients alive until a suitable human organ has been found or, perhaps, in the future even to use these organs for long-term therapy. From an ethical

point of view, however, the relationship between man and beast forms a central theme in the discussion over whether the transplantation of animal organs can be reconciled with our moral feelings. The central question here is, what position does man occupy in the hierarchy of living creatures? It seems realistic to assume that most humans would ascribe a lower position to animals than to humans. However, this value judgment does not imply that we should allow animals to suffer unnecessarily or that we should use them without restriction for the sake of our own health. In view of the growing awareness and reverence for nature and the environment, it would be wise from a moral point of view to only use animals as "organ suppliers" when there is absolutely no other alternative for saving human lives.

Conclusion

The argument that every patient should wait his or her turn according to a random lottery is not without a legal precedent. After the lifeboat from the William Brown had reached the coast safely, a man named Holmes, who was one of the crewmen, was arrested, tried, and convicted of murder. The judge decreed that the passengers should have been spared at the expense of the non-essential crewmen. If that was not possible, the passengers should have been able to select their own victims by means of a lottery. The Court of Justice decided that, under the circumstances, a lottery would have been the only morally acceptable selection process.

A more contemporary view was reached at the conclusion of a joint meeting of the European Society for Organ Transplantation (ESOT) and the European Dialysis and Transplant Association/European Renal Association (EDTA/ERA) in Munich in December of 1990. One of the resolutions accepted by the participants was that "cadaveric organs procured within a community should be considered as assets of the community, and the community rather than just the medical profession should determine their allocation through announced criteria" [6].

Finally, it is encouraging to note that, recently, the Euro-Parliament, the Council of Europe, and the French Parliament have all addressed the ethical aspects of organ procurement and transplantation.

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