
Quill on Scalpel

Plume et scalpel

ETHICS AND XENOTRANSPLANTATION

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In the early 1960s, renal xenotransplantation from chimpanzees and baboons to humans was tried¹ as was liver² and cardiac³ xenografting. Preliminary studies demonstrated the technical feasibility of the procedures.⁴ At that time, the ethics of xenotransplantation was not questioned.

In 1984, after Bailey and associates transplanted the heart of a baboon into a neonate,⁵ the ethical dilemma of xenotransplantation suddenly struck the medical community in the United States. At that time, there was some agreement that research involving xenografts was ethically defensible because of the shortage of available organs.⁶ However, the case of Baby Fae⁶ raised many ethical questions, notably those concerning inadequate scientific preparation, the nature of consent for xenotransplantation and the use of animals from an endangered species.

Today the medical arena is open to intense public scrutiny, and it is probable that when xenotransplantation becomes available clinically it will be a matter of heated debate.

In this issue of the Journal (page 12), Bigam and associates, have reviewed the literature to update our knowledge of xenotransplantation and have presented some ethical issues. They remind us that there are major unresolved scientific problems such as

zoological diversity and histocompatibility. The impact of the physiological hormonal characteristics of the animal in xenotransplantation are not well known. Although acute rejection can now be managed, the long-term survival of such transplants is unknown. The important clinical questions concerning viral xenozoonosis are still unanswered. Recent experience with the human immunodeficiency virus reminds us of how little we know about viruses. Furthermore, the massive long-term immunosuppression required and its potential severe side-effects have not been fully studied.

Although many patients have benefited from allotransplantation over the past 40 years, a large number of potential transplant recipients have been disappointed because no organs were available. For this group, the major issue is the supply of organs, and xenotransplantation would provide the solution. However, the pursuit of survival at any cost should not make us ignore important ethical issues.

The medical profession has accepted and supported allotransplantation since its inception. However, we do not know if the medical profession generally will approve and support xenotransplantation with the same energy, because so many ethical questions remain unanswered.

After the first renal transplantation was performed by Murray in 1954,⁷ the medical profession began to challenge these procedures on the basis of ethical issues. First, a debate was initiated through the medical literature.⁸ Later, an interdisciplinary discussion about the ethical and legal issues of allotransplantation involved nephrologists, surgeons and lawyers.⁹ At that time, surgeons demonstrated their interest and capacity to participate in the research to solve these ethical issues.

Allotransplantation became acceptable because organ donation was interpreted as a "gift of life." It became incorporated in medical ethics as a new moral value. The problem of mutilation raised by transplantation was sanctioned by the noble intention of offering one's organ after death or even during life.¹⁰ The reflections of physicians, lawyers, theologians and philosophers finally converged at the central concept of organ donation as a gift, and it carried moral weight and public acceptance.¹¹ However, it may not be possible to apply the same arguments to the ethics of xenotransplantation.

Not all members of the medical profession may be comfortable with xenotransplantation. Several questions come immediately to mind: Do we really need xenotransplantation? Does xeno-

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transplantation alter our definition of a human being? Are we transgressing the laws of nature? Does life need to be prolonged at any price? What are the psychological and biological effects of xenotransplantation on the recipients? What are the implications for society, and for future generations? What are the effects on animals? Do we care about animal suffering and genetic manipulation of animals?

Xenotransplantation is a response to the problem of organ supply. Other solutions have been examined in the past and have been debated.¹² One solution was the marketing of organs, including buying and selling of organs for compensation. A second solution was harvesting organs from those who have not expressly made the gift in advance. Both solutions were unacceptable because they did not adhere to the principles of voluntarism and altruism. Any elements of commercialization are to be rejected. Among other options, the use of organs from anencephalic infants has been proposed. This solution also presents legal and ethical problems. The anencephalic infant is legally a human being and does not respond to the criteria of brain death. Therefore, salvaging organs from such an infant would constitute direct killing.¹³ Other options have been examined, such as the modification of the criteria for brain death.¹² This solution was unacceptable because it was thought to represent the first step on the slippery slope leading to the eventual use of all brain-damaged patients as organ donors.

The ethics of allotransplantation has promoted the value of improving quality of life, of respecting individual autonomy and of promoting some sense of community through the gift of organ donation.¹³ Respect for the wishes of the family and the dignity of the body has always been advocated in the

ethics of allotransplantation. Those values must be preserved. However, other values are at stake with respect to xenotransplantation: respect for animals, security of patients and people in general, commercialization.

As physicians and citizens, we cannot ignore the problems presented by xenotransplantation. Before it becomes a clinical reality, surgeons need to confront the ethical issues. These questions cannot be hidden and should not be solved solely by bioethicists. Bioethicists can bring some light to the problem of xenotransplantation, but the vision and convictions of the medical profession must be incorporated. Because bioethics has dominated the ethical discourse in medicine does not mean that we, as surgeons, should not be involved in this debate.

Bigam and associates have expressed their opinion about xenotransplantation. They do not believe it should be introduced clinically until prolonged survival has been obtained in a transgenic pig-to-nonhuman primate transplantation. This is one opinion. Other opinions from government groups and transplant societies, which are actively involved in examining all aspects of xenotransplantation including ethical issues, should clarify some of the ethical guidelines that we need for future clinical decision-making.¹⁴⁻¹⁶ With respect to xenotransplantation, many surgeons feel personal responsibility to their patients and to society. Therefore, ethical reflection and ethical discussions must continue and must include the surgeon's contribution.

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