A Change of Heart: Psychiatric Considerations in the First Pig to Human Cardiac Xenotransplantation

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Introduction

- **Xenotransplantation is a potential solution to the scarcity of suitable organs for transplantation**
- **The experimental nature of the procedure calls for adaptation of the already complex pre-transplant evaluations**
- **Guidelines for recipient selection and management are limited and leave extensive room for interpretation**
- **There are additional risks and little regulatory protection for vulnerable individuals**
- **This case describes the first xenotransplantation performed on a consciously consenting human recipient, and the involvement of the consultation-liaison (CL) psychiatrists during the process**

Case Report

- **Mr. X is a 57-year-old male with a cardiac history of atrial fibrillation and mitral valve regurgitation, and a reported psychiatric diagnosis of schizophrenia, who was admitted to the hospital in cardiogenic shock**
- **He was referred for standard heart transplantation and ventricular assist device (VAD) evaluations, however, his surgical team and CL psychiatry determined that he was at high risk for post-transplant complications**
- **Mr. X's clinical condition deteriorated, and he was emergently placed on ECMO. With no other option for survival, he was presented with the opportunity for experimental cardiac xenotransplantation**
- **Concerns about his vulnerability as a reported psychiatric patient led to three additional demands for psychiatrists to evaluate his capacity to consent**
- **All three CL psychiatrists found the patient to have capacity to consent for the procedure**
- **Mr. X survived for two months after the transplant. He subsequently succumbed to organ rejection and multi-system organ failure**
- **Aspects of Mr. X's personal history were brought to the public attention and sensationalized, requiring responses by the treatment team and his family**

Pre-transplant Psychosocial Evaluation	Risk Factors	Risk Stratification
Substance abuse	-Sporadic marijuana use; valid medical marijuana card -No alcohol or illicit substance use in over 20 years	Low
Psychiatric disorders	-Anxiety, hypervigilance and nightmares related to prior assault -Unsubstantiated historical diagnosis of paranoid schizophrenia -No psychiatric medications at time of hospitalization -MOCA 20/30 -CT head: moderate cerebellar encephalomalacia, diffuse volume loss	High
Compliance	-Superficial and concrete knowledge of diagnosis, transplant procedure -Difficulty keeping appointments -Self-adjusting medications -Leaving hospital AMA x2	High
Social supports	-Family available for support	Low

Discussion

- **Publicity, loss of confidentiality and intrusive public interest figured largely in this case, as did ethical ambiguity about the exact nature of consent and questions of equitable selection**
- **Unprecedented issues of informed consent had to be addressed, since no previous xenotransplant recipient had been able to participate in decision-making**
- **Three capacity evaluations were hastily requested in an ad hoc attempt to address conflicts of interest and potential exploitation of a vulnerable patient**
- **We propose developing a multidisciplinary team for xenotransplantation, with CL psychiatry involvement from the earliest stages to stratify risk and vulnerability, clarify psychiatric diagnoses, and assess potential psychiatric consequences both pre- and post-transplant**

Conclusion

- **Future xenotransplantation recipients and their families should receive information and preparation beyond what was forseen to be necessary in this case**
- **As xenotransplantation continues to be developed, unanticipated difficulties are a certainty, and prospective, proactive involvement of psychiatric services will be necessary**

References

- **Woodruff MFA: Ethical Problems in Organ Transplantation. Brit Med J 1965; 1:1457-1460.**
- **Cooper DKC: Genetically engineered pig kidney transplantation in a brain-dead human subject. Xenotransplantation. 2021; 28(6):e12718.**