

CURRENT CONTROVERSIES IN MUSCULOSKELETAL TISSUE BANKING IN AUSTRALIA

The Queensland Bone Bank has passed through an evolutionary period spanning some fifteen years. It initially took the form of a small –16 degree freezer purchased from a local electrical store and housed in the outpatients department. The prime aim of the Bank in those days was to subserve the needs of the orthopaedic surgeons at the Princess Alexandra Hospital. Over the subsequent years it has grown steadily such that it now employs twelve staff, occupies a freestanding building and is the largest tissue bank in Australia.

In concert with this exponential growth, the Bank has a formal management structure which provides operational guidance and strategic positioning within the tissue banking fraternity. The Bank has both clinical and administrative wings, and has achieved a position of full cost recovery and financial self reliance. The Bank was the first to attain a licence to produce musculoskeletal allograft tissues in Australasia.

Donor materials are sourced from living donors (femoral heads) and cadaveric donors (multi organ donors, hospital mortuary donors and Coroner's mortuary donors). Material is retrieved from more than 800 donors each year.

The Bank currently distributes in excess of 2,000 allograft segments annually, assisting 750 patients with orthopaedic, neurosurgical and dental operative procedures.

Any allograft operation carries with it the potential risk of transmission of unwanted disease to surgical recipients. Scrupulous screening of donors serves to limit the risk of transmission of viral and prion particles. Bacterial contamination at any stage between retrieval and distribution is a similarly ever present problem of significant proportions. Some form of secondary sterilisation is recommended by governing authorities. Gamma irradiation has both beneficial and deleterious effects. Whilst the process diminishes allograft allogenicity, guarantees bacterial sterility and may diminish the viral bioburden, it also increases the solubility of the collagen matrix in bone and may hasten degradation of important bone morphogenetic proteins.

The oscillatory phases of the donor pool and recipient requests are often not synchronised. Brief periods of supply difficulty can be encountered. The Queensland Bone Bank is currently exploring a number of options which may equilibrate the supply and inject greater certainty into this burgeoning industry.

The Queensland Bone Bank is actively involved in basic scientific and clinical research projects investigating both the biomechanical strength and osteo-inductive capacity of its allograft products.

Future horizons include chemical modulation of allograft materials, protein enhancement of osteo-inductive capacities, stem cell therapy and skeletal farming. All of these issues will be addressed in this paper.

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