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PROCUREMENT OF BONES AND SOFT TISSUES

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SUMMARY

Bones are either procured from living or deceased donors. However, before procurement, consent is sought from the donor or the next-of-kin. This legal practice is commonplace in Singapore and most Asia Pacific countries. The Medical Therapy, Education and Research Act of 1972 serve as the legal framework in Singapore. Consent must also be obtained for serological and immunological tests to be conducted. Blood samples are screened for anti-HIV1, anti-HIV2, Hepatitis B, Hepatitis C and Syphilis. Once the relevant approval is acquired, bone procurement from living donors is carried out in the operating theatre under sterile conditions.

Living Donors - Potential donors include:

- Elderly patients with fracture neck of femur undergoing hemiarthroplasty
- Elderly patients with osteoarthritis of the hip undergoing total hip replacement

The bones procured sterile in the operating theatre is stored in “sterile double jars” after sending a piece of bone for culture.

Deceased Donors - In Singapore, bone procurement from deceased donors is part of a Multi-Organ and Tissue Procurement System coordinated by the Ministry of Health (MOH). Under this system, the organs and tissues procured include kidneys, liver, heart, cornea and bones. A National Transplant Co-Coordinator is responsible for approaching the donor or the relatives for procurement and test screening consent. The aforementioned laboratory screening tests include blood grouping, HLA typing, anti-HIV1 and anti-HIV2, HbsAg, anti-HCV, RPR (TPHA) and anti-CMV. All potential donors with sudden but known cause of death are approached. Consenting donors usually agree to donate both kidneys with 10 to 20% also agreeing to donate their bones. In these cases, the consent form indicates the limb or limbs from which the bones and ligaments can be procured.

Plans must be made to procure parts of the deceased donor long bones: Proximal femur, Distal femur, Proximal tibia, Distal tibia, Proximal fibular, Distal fibular. These long bones are stored using “sterile triple wrap technique” after sending cultures specimen. Soft tissue allografts procured include patellar tendon, calcaneum tendon, and tibialis anterior/tibialis posterior tendons. These are stored in “double jars”. All bones and soft tissue allografts must be found to be negative for all serological test and culture test before they can be used. For deep freezing they must be stored at -70 degrees before they can be utilized. The bone allografts are preferably gamma irradiated before use.

Deceased donor requirement is a huge logistical exercise. It requires organisation, co-ordination and planning and manpower requirements. The key to success is training and co-operation from all personnel involved.