



TISSUE BANK OF TATA MEMORIAL HOSPITAL

The banking of tissues for surgical use is one of the recent advances in patient care. Today, tissues such as skin, bone, dura mater, heart valves and blood vessels are being acquired, banked and transplanted with considerable clinical success. They are benefiting thousands of patients crippled by congenital defects or disfigured and disabled by burns, accidents or disease.

While the use of a patient's own tissues (autografts) remains the gold standard, the use of tissues taken from another individual (allografts) has its own advantages. Allografts eliminate additional incision necessary for acquiring an autograft and consequently reduce operating time, blood loss as well as hospital and medical costs. They also avoid the sacrifice of the patient's normal structures and the additional trauma involved. Children, in particular, depend on banked allografts because they frequently do not possess sufficient tissues to meet their surgical needs.

Tissue Banking

The Tissue Bank at the Tata Memorial Hospital (TMH) is a pioneering effort in the country to provide safe and reliable tissue allografts. It was set up in collaboration with the International Atomic Energy Agency (IAEA) in 1988 to promote the use of radiation for the sterilisation of biological tissues and currently represents the Government of India in this Inter-regional project covering the Asia Pacific, Latin America, Africa and eventually Europe.

At the Tissue Bank, tissues from suitably screened donors, are processed, lyophilised (freeze-dry), and terminally sterilised by gamma irradiation of the packaged grafts.

The high penetration of gamma radiation enables the convenient sterilization of the bulk of the hard or soft tissues in the final packaged form thereby cutting overall costs. Tissues sterilized in this way do not become radioactive and are completely safe.

Lyophilised grafts from the TMH Tissue Bank are gamma irradiated at the ISO 9001:2000 certified ISOMED, the radiation sterilization plant for medical products set up by the Board of Radiation & Isotope Technology (BRIT) of DAE. Alternatively they are irradiated in the Gamma Chamber-1200 manufactured by BRIT and housed in the TMH Tissue Bank.

The ready availability of indigenous allografts sterilized by irradiation has enabled innovative approaches to surgery that have helped save patients' lives or limbs or made



Tissue grafts being irradiated in the Gamma Chamber-1200 in the TMH Tissue Bank. The equipment has been manufactured by BRIT.



A defect following tumour resection reconstructed at TMH with irradiated bone allograft

rehabilitation quicker and less painful. Skin grafts have served successfully as biological dressings in the treatment of burns.

Amnion is another excellent biological dressing which mimics skin. Fresh amnion carries the risk of disease transmission and is not always available on demand. Its cumbersome retrieval and the need for cleansing and sterilisation, deter its use by surgeons. Radiation permits the supply of sterile amnion off-the-shelf. These have been used as temporary wound covers in the treatment of ulcers, burns, wounds, unresponsive bedsores and abscesses.



Irradiated amnion from TMH Tissue Bank being used in a patient with burns.

Its biggest advantage lies in its availability as ready-to-use packs that may be conveniently stored for long periods at room temperature.

Dura mater grafts have been used in duraplasty and in abdominal wall reconstruction following tumour surgery. In oral surgery they have found use as gingival grafts and as barrier membranes in periodontal guided tissue regeneration proving to be cost effective alternatives to imported membranes.



Irradiated bone powder from the TMH Tissue Bank being used in a periodontal osseous defect.

Singapore and Buenos Aires (Brazil). It is currently engaged in the process for implementing the IAEA Code of Practice for the Radiation Sterilisation of Tissue Allografts and will serve as the National Centre for the IAEA/NUS Internet Diploma Course for Tissue Banking, the first of its kind in the world.

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At the TMH, banked amnion has proved to be particularly valuable in the management of moist skin ulceration in radiation therapy patients. Such ulcers are often difficult to treat in areas like groin. Amnion adheres easily to the irregular contours, does not require to be changed frequently, reduces pain and enhances healing. It has proved to be more efficacious and cost effective than routine dressings.

For the first time in India, freeze-dried, irradiated amnion has been used in orbital and ocular surface reconstruction to restore sight following injury and disease. Its biggest

Bone powder is used effectively in the treatment of periodontal osseous defects. Bone grafts have found use in reconstructing skeletal defects, fusing joints, and augmenting fracture healing and joint reconstruction procedures. At the TMH they have enabled reconstruction of massive defects and limb salvage following tumour resection.

As a participant in the IAEA project, the TMH Tissue Bank has contributed towards the development of the Multi-media Distance Learning Package on Tissue Banking which forms the basis of the first comprehensive IAEA/NUS Curriculum in Radiation and Tissue Banking offered as a Diploma Course in

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