Title: **The Present Status and Future of Meniscal Transplantation**

Author: Allan E. Gross M.D., F.R.C.S.(C)
Mt. Sinai Hospital
University of Toronto

Experimental meniscal transplantation in rabbits has been performed to evaluate the healing response of free meniscal allografts. Fresh, frozen, and frozen irradiated allograft menisci were inserted with interrupted sutures. Macroscopic, microscopic, biochemical and viability studies were performed. Meniscal allografts healed peripherally. The donor cells died and the meniscus was repopulated by host cells within six months. Tritiated cytidine radiography revealed that fresh allografts started with 90 % viable cells, while frozen cryopreserved menisci had 4% viable cells. Even in fresh grafts by two months, most cells died and repopulation was necessary. During the period of cell repopulation the menisci remained structurally intact. There was a mild immune response to allograft tissue compared to autograft menisci. Overall experimental meniscal transplantation by many investigators has supported the clinical use of meniscal allografts.

From 1972 to 1992, 126 osteochondral allografts were carried out for post traumatic defects of the knee. As part of that series 47 meniscal allografts were performed as part of a composite osteochondral plateau graft for trauma. There was an 85% success rate for the entire series at an average follow up of 7.5 years. There was no relationship between failure and the need for meniscal allograft. In a more recent study of 60 knees that had received fresh femoral condylar allografts for traumatic defects, 10 meniscal allografts were transplanted. At a mean follow up of 10 years there was an 85% survival with patients requiring a meniscal transplant doing as well as those that did not. Arthroscopic examination of 10 allograft menisci at an average follow up of 4.5 years revealed structurally intact menisci with some degenerative changes and viable cells.

The issues to be considered for the future for meniscal transplantation are the indications, preparation, sizing, surgical technique and evaluation. The potential indications are the post menisectomy early arthritic knee with or without an osteotomy, the post menisectomy knee undergoing ligament reconstruction, fresh meniscal tears that cannot be repaired and the meniscus as part of an osteochondral allograft. In our experience fresh tissue does best but the logistics are more difficult and there is the risk of disease transmission. Plain x-rays are adequate for sizing the medial meniscus but C.T. or M.R.I. is more accurate for the lateral meniscus. In our series direct suturing was used but other authors advocate bone blocks. Evaluation of meniscal allografts should be done by arthroscopic examination and biopsy.