Current and Future Meniscal Salvage and Restoration Strategies

During surgical treatments of meniscus injuries, preservation of sufficient meniscus tissue to retain normal functioning is not always possible.

Efforts are, thus, currently focused on strategies for salvage and reconstruction.

Meniscal Allograft Transplantation
- Most common salvage surgical option in patients <50 years with functionally limiting meniscal deficiency
- Improvement in pain, swelling, and clinical outcomes in the short and intermediate terms
- Temporizing treatment, with graft degeneration and osteoarthritis progression in the long term

Meniscus Scaffold
- Option for symptomatic partial meniscectomies in adults <50 years, with preservation of meniscal roots
- Aims for meniscal tissue development by allowing growth and migration of vascular channels and precursor cells into pores of the scaffold
- Types are: synthetic scaffolds, hydrogels (synthetic, biologic, and hybrid), and tissue-derived materials

Bioprinting
- 3D printing using various combinations of bioink, cells, and thermoplastics
- Aimed at preventing patient wait time to transplantation, preventing patient deterioration over time, and providing patient-specific sizing (by measuring patient knee via MRI scans)
- Still at the research stage

Current and future meniscus salvage and restoration techniques provide acceptable but imperfect results; however, they may improve treatment for meniscal deficiency.