

Posttraumatic Intraarticular Deformities & Defects: Joint Preserving Options From Intra-Articular Osteotomies To Allograft Joint Transplantation

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Large cartilage defects do not heal. While joint replacement is a good option for the elderly, this is not the case for younger patients, who have more complications (loosening, revisions, bone loss) and less good long term outcome.

Until recently, intraarticular osteotomies for the treatment of posttraumatic intraarticular deformities & defects have not been possible. The use of modern 3D analysis and planning has opened new options for the treatment of these difficult problems. Intraarticular osteotomies can 'rebuild' the physiologic articular osseous contour. In case of severe cartilage degeneration, cell transplants can be a solution for certain cartilage defects.

In cases of large articular destruction (frequently in combination with severe meniscus destruction), the transplantation of osteochondral allografts is another promising surgical option. Bulky osteochondral and frozen allografts do not get vascularized well and degenerate rapidly.

The use thin fresh large osteochondral shell allograft transplants (FLOCSAT) allows a biologic treatment for active patients with large defects. Results from the literature show after transplantation of fresh small osteochondral allografts up to 74% functional survival at 15 years and 79% return to pre-injury sport level. FLOCSAT cartilage cells stay alive in storage systems for up to 4-6 weeks with cell survival >70%. The cartilage cells are protected from host cell response by their matrix and survive. Our group and others can present DNA data showing that cartilage cells in the graft undergo slow exchange with host cartilage cells over years. Vascularization and osteointegration is fast (6 – 12 weeks) and has further improved by the use of stem cell concentrates.

One of the difficulties in managing multi-planar defects with FLOCSAT is the geometric fit. The problem is to create a thin graft shell with full contact to the host bone. This is relatively easy in uni-planar osteotomies (patella, tibia plateau), but gets very difficult in curved complex geometries as distal femur, ankle or elbow. The lack of reference can lead to incomplete contact (gap problem). This compromises vascularisation, osteo-integration, cartilage nutrition, and normal joint function. The concepts, planning, surgical techniques as well as clinical and radiographic results of various joint preserving techniques (intraarticular osteotomies, joint transplantation) of posttraumatic intraarticular deformities in knee, ankle and elbow are presented.