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In this essay we discuss the different biological methods used in biological resurfacing of articular cartilage defects (especially in the knee joint) clinically and in experimental animals. In order to that we discuss in this essay the histology of articular cartilage as a preliminary step to know it's contour, composition and it's zones. Also spot light about the types of tissues used in articular resurfacing was done like:-

1- Periosteurm

2- Osteochondral autografts

3- Chondrocytes grafts

4- Osteochondral allografts

5- Perichondrium

Because of the extremely limited potential of damaged cartilage for either repair or regeneration and the fact that prosthetic replacement is contra indicated for children and young active adult, the need exists for methods of producing biological resurfacing of large full thickness defect in diseased or damaged joint by transplantation of a tissue that has significant chondrogenic potential

Various experimental approaches to biologic joint resurfacing have been tried including periosteal grafts, perichondral grafts, osteochondral allografts, osteochondral autograft and chondrocytes. The history of periosteal transplantation began with the study of ollier in 1967 and several researchers have confirmed that the cells of the cambium layer of the periosteum when detached from bone and transplanted in

experimental defects in a knee joint differentiated into hyaline like tissue which resembled the surrounding orginal cartilage histologically. Many factors affect regeneration of cartilage from periosteal graft as oxygen tension. Low oxygen tension favors production of cartilage, orientation of the cambium layer, age of the donor animal. Also many trials were done to resurface defects in articular cartilage and the results were satisfactory but need further investigations. Autogenic osteochondral graft also used in biological resurfacing of articular cartilage defect and has some distinct advantages as reliability of the bony union, a high survival rate of the grafted articular cartilage and no threat of disease transmission. However there are some disadvantages as adverse effects on joint function due to harvesting and limitation in graft size.

The biological resurfacing approach to repairing defects in articular cartilage using implants containing cultured proliferating chondrocytes is one of the most promising procedures used for treating the most common joint diseases such as traumatic lesions of cartilage and perhaps osteoarthrosis. Recently the accumulated knowledge on biological resurfacing in animals was used experimentally for human subjects.

The use of a fresh osteochondral allograft to resonstruct defects of articular cartilage is a viable alternative to arthrodesis or prosthetic arthroplasty of the affected joint. The supplemental use of autogenous bone graft is belived to enhance the incorporation of the osseous shell of the allograft and to decrease the amount of allograft cancellous bone needed to reconstruct a deep defect. Osteochondral allograts have many indications. By several researches showed that the best results were with

post traumatic defects other indications include osteonecrosis, following tumour resections for preservation of the limbs, avascular necrosis and chondromalacia.

Many complications regarding osteochondral allografting, the important of which are infection, non union, fractures, ligaments instability and degenerative arthritis.

Perichondrial grafts have the capacity to generate cartilage but the differentiation of this basic tissue to form hyaline cartilage is dependent on extrinsic influences emanating from its environment. The presence of motion, low oxygen tension and absence of vascularity of the synovial environment could favor and maximize its development.