Articular cartilage does not contain vascular, nervous and lymphatic tissue and chondrocytes hardly participate in the healing or repair process of chondral tissue because of being surrounded by plenty of extracellular matrix. Therefore, the injury to articular cartilage frequently requires an operative treatment. The goal of surgical repair of articular cartilage is to regenerate nearly normal chondral tissue and prevent degenerative arthritis caused by the articular cartilage defect. Microfracture is a kind of cartilage repair procedure that makes a fibrin clot containing mesenchymal stem cells in the chondral lesion. Microfracture is a simple procedure but it has a disadvantage that the repaired tissue is fibrocartilage. Autologous chondrocyte implantation has an advantage that it implants fully differentiated chondrocytes to the lesion, which theoretically produces hyaline cartilage. Its disadvantages are that it is a two stage and a costly procedure. Osteochondral autograft transplantation is a one stage procedure and repairs the lesion with hyaline cartilage. But its limitation is the lack of donor site availability. Surgeons who understand the theoretical background, indications, surgical methods, rehabilitation, complications, and clinical course of cartilage repair procedures can achieve the goal of preventing degenerative arthritis.

**Key words:** Knee joint, Articular cartilage, Focal chondral lesion, Management.
of defects, and presence of combined defects. Available treatment options include conservative treatment, surgical treatment for symptom relief or articular cartilage restoration.

1. Conservative Treatment
Conservative treatment for chondral defects of the knee can be effective for pain relief, but it cannot be used for articular cartilage restoration. Craig et al. suggested that conservative treatment can be an option when mild pain is present or the risk of surgery is greater than its benefit. Messner and Maletius followed up 28 patients with isolated chondral damage of the knee for 14 years and concluded that conservative treatment was not helpful in preventing the progress of the damage: the patients had excellent or good clinical results, but radiographic examination revealed abnormal findings in ≥50% of the patients. Conservative treatment includes the use of non steroid anti inflammatory drugs (NSAIDs), pain killers, hormones (estrogen and growth hormone), chondroprotective agents (glucosamine & chondroitin phosphate and omega-3), intraarticular injections of steroids or hyaluronic acid, weight loss to reduce the load on the knee joint, braces, and physical treatment. Unfortunately, these methods can be useful for symptom relief only not for restoring structural integrity of the articular cartilage.

2. Surgical Treatment
The purpose of surgical treatment is to improve symptoms and prevent degenerative changes by achieving structural and biomechanical restoration of the articular cartilage. Surgical treatment methods can be broadly divided into arthroscopic lavage and debridement, cell-based therapy (subchondral bone stimulation for chondral tissue differentiation or culture and implantation of chondrocytes), and tissue-based therapy (osteochondral autograft transplantation or osteochondral allograft transplantation). The advantages/disadvantages of each method, size, location, and depth of a lesion, and the patient’s age and activity level should be assessed to determine an appropriate treatment method. However, the two most important factors that should be considered are the cause and characteristics of chondral defects. Chondral lesions can be either focal or degenerative. For the treatment of focal lesions, sufficient debridement should be performed to maintain the adjacent area in the articular cartilage healthy for successful structural and biomechanical restoration. In contrast, for degenerative lesions where the defective and transitional area is wide, a sufficient debridement may restrict subsequent treatment options or cause unfavorable results. In addition, poor cell/tissue regeneration ability may result in less than satisfactory outcome after surgery. Therefore, the cause and characteristics of chondral lesions should be taken into consideration in performing surgical treatment.

1) Arthroscopic lavage and debridement
There has been a transition from open to arthroscopic lavage and debridement of chondral lesions. Arthroscopic lavage is to remove inflammatory mediators that may be responsible for joint effusion and loose cartilage and collagen debris. Debridement of articular cartilage (chondroplasty) is a procedure for removing unstable cartilage fragments or margins of the cartilage that may cause joint impingement with a curette or a shaver in order to alleviate joint pain and prevent additional articular cartilage destruction. Jackson et al. observed clinical improvements in 80% of their patients at 3.5 years after arthroscopic debridement and correlated degenerative changes with clinical outcome. However, Kirkley et al. reported that arthroscopic surgery for knee cartilage defects provided no additional benefit to optimized physical or medical therapy. Arthroscopic repair can be helpful for preventing the progress of delamination of articular cartilage, but there is controversy over its influence on the long-term longevity of the articular cartilage.

2) Cell-based therapy
Cell-based therapy is a promising approach using the patient’s own cells for the treatment of chondral defects. There are marrow stimulating procedures and autologous chondrocyte implantation (ACI). Marrow stimulating procedures include abrasion arthroplasty, drilling, and microfracture. However, the former two are currently rarely performed because they have been associated with poor clinical outcome.

(1) Microfracture
Microfracture is an articular cartilage repair technique in which tiny fractures are made 2-4 mm apart from each other to cause bleeding in the subchondral bone and fibrin clots in the perforations release mesenchymal stem cells that would differentiate into chondrocytes.

Multi-potential mesenchymal stem cells can differentiate into fibrocartilage cells and chondrocytes and induce fibrocartilage or hyaline-like cartilage formation. Fibrocartilage contains more collagen and less proteoglycans compared to hyaline cartilage. It is composed of more type I collagen than type II collagen. Type I collagen has lower compressive strength, elasticity, and wear resistance compared to type II collagen. Accordingly, fibrocartilaginous repair eventually results in failure