

## Current Advancement in Management of Osteoarthritis

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Osteoarthritis is a chronic, progressive musculoskeletal disorder characterized by gradual loss of cartilage in joints which results in bones rubbing together and creating stiffness, pain, and impaired movement. The disease is associated with increase in age and modifiable and non-modifiable risk factors such as obesity, lack of exercise, genetic predisposition, bone density, occupational injury, trauma and gender.

Osteoarthritis OA is broadly classified into two groups primary and secondary. Primary osteoarthritis is a chronic degenerative disease and is related to aging. The water content of the cartilages decreases on increasing age, thus making them more susceptible to degradation. While secondary arthritis usually affects the joints earlier in life due to specific causes such as injury during a job requiring frequent kneeling or squatting for long duration, diabetes and obesity.

With increase in aging population in our country, osteoarthritis of the knee one of the most common causes of disability among elderly population. This makes disability in form of limited mobility & restricted participation in social life in otherwise healthy older age population and can also be a precursor to heart related diseases. Knee arthritis is more common among Asian population due to our cultural and social life style and also has increased in recent years due to dietary and life style changes in the last three decades.

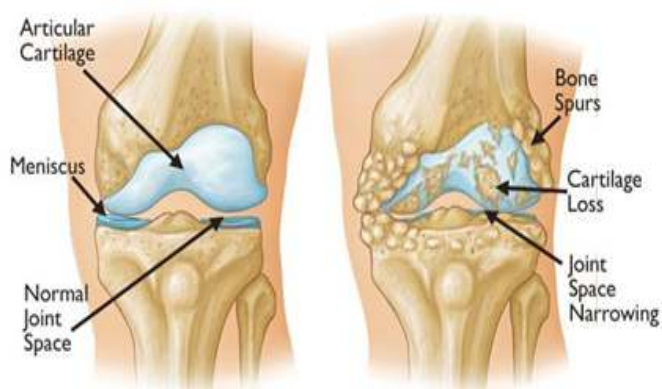
Regarding the incidence, according to national health portal with data published in 2017, Osteoarthritis is the most frequent joint disease with prevalence of 22% to 39% in India. This is more common among women than in men with ratio of approximately 2 to 3:1. More than 50% of patients older than 65 years have radiographic changes in the knee that indicate arthritis.

According to the data 80% of those with osteoarthritis have limitations in movement, and 25% cannot perform their major daily activities of life.

As highly effective long term medical management is not available as compared to other chronic diseases, emphasis should be given to preventive aspect of life style measures in the form of healthy diet and exercise. Knee arthritis clinically manifests in form of pain and stiffness that worsen after not moving the joint for a while, swelling, difficulty moving the affected joint, warmth and tenderness in the joints and a loss of muscle mass around the knee.

Cartilage is the protective substance that cushions the ends of the bones in the joints and allows the joints to move smoothly and easily. In people with OA, the smooth surface of the cartilage becomes rough and starts to wear away. As a result, the unprotected bones start to rub together, causing damage and pain. Eventually, bony lumps form on the joint. The medical name is "osteophytes," which can lead to a knobby joint appearance. These are calcium phosphate and calcium pyrophosphate dihydrate crystals in the joints. As the bones change shape, the joints become stiffer, less mobile, and more painful. Fluid may also accumulate in joint

**Fig. 1 : The causes of knee problems**



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**Management:**

The medical management of knee arthritis include includes use of pain killers in the form of NSAIDs in oral or local form and cartilage supplement agents like chondroitin sulfate, collagen supplements. This is specially recommended for first time presenters. Also some life style modifications and non pharmacological pain relieving therapy in form of physiotherapy. However these methods seldom affect the natural progression of the disease. With increasing age and natural progression of the disease, there comes a stage where some form of surgical treatment may be required in more than 40 to 50% of the population to completely relieve the symptoms and improve the mobility of the patients. Some newer pharmacological treatment like Visco supplementation in form of knee intra articular injections has come up which tries to restore synovial fluid. However this is only useful in the early stages of the disease or for somebody who is otherwise too medically unfit to undergo surgery.

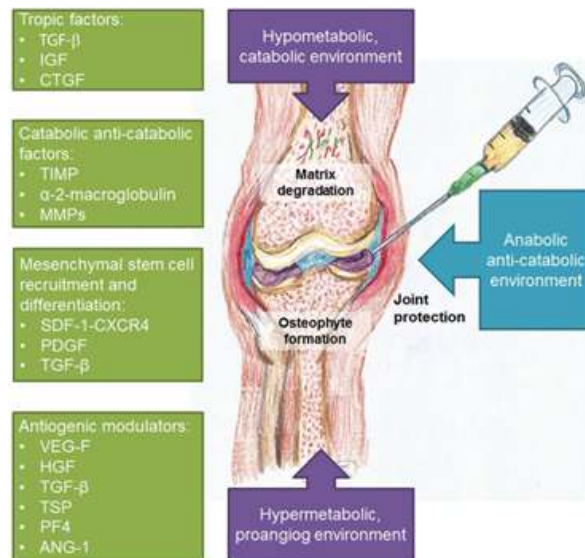
In terms of recent developments in medical treatment and as a regenerative biological cell therapy of Osteoarthritis, Mesenchymal Stem Cells (MSCs) have the potential of self-renewal and differentiation into cartilage and the capability of immune modulation. A number of preclinical and clinical studies have confirmed the potential for MSCs as a novel therapeutic strategy for the treatment of OA. This is specifically useful for post traumatic arthritis in young people.

Platelet Rich Plasma (PRPs) therapy in form of intra articular knee injection is also an option but hasn't shown favourable and consistent reproducible results.

**Surgical management:**

In early anteromedial compartment osteoarthritis, Uni-compartment Knee Replacement (UKR) is considered as safe and effective modality provided patient has isolated medial compartment osteoarthritis and intact ACL ligament. There is no specific age barrier for performing it.

**Fig. 2: Medical Management of osteoarthritis**



For advanced degenerative knee arthritis, especially for older population Total knee replacement has been the Gold Standard Treatment establishing its superior safety and efficacy & best long term results over any other surgical treatment since last four decades. Surgery in form of knee arthroscopy and osteotomy around the knee has some role for a very specific subset of patients with limited and very specific indications.

**Fig. 3 : Surgical Management of osteoarthritis**



In field of the total knee replacement, many advances have taken place in the last two decades for better clinical outcomes especially in the surgical technique. This has been led by tech boom which started in early 2000. By 2005, first computer assisted navigation system for total knee replacements surgery was available in India for clinical use. This was the first time actual computer entered orthopaedic operation theater. In the similar time line, developments in field of

robotic assisted total knee replacements were going on although being used at limited number of centres. In the recent years, the two technologies have been combined and navigation assisted robotic surgery is available for clinical use. It currently offers best possible scenario, offering best intra operative decision making and best execution mechanical arm removing human error so as to give most optimal long lasting results.

Better understanding of morphological anatomy of different ethnic groups populations, their cultural requirements, developments in metallurgy and manufacturing techniques have led to better designed joints which are currently available for the clinical use. These offer best durability of artificial joints in terms of least wear with excellent function using least inert

materials to the body so that patients have best optimum functional outcome with least metal related biological issues.

In terms of improved techniques of patient care, better pre, intra and post operative management, improvement in form of good pre-op evaluation, improved intra operative monitoring and excellent post-op care in form of reduced blood loss and minimal post operative pain with earliest rehabilitation and reduced incidence of DVT and pulmonary embolism have made it possible for total knee surgery being offered as day care surgery at many centres. The field is ever evolving and we hope to have more improved clinical outcomes as new developments continue to happen for better patient care.

**Fig. 4 : MAKO Robot for Knee Replacement**

