



Healthy

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A PROMISE for the Future

6 years of Joint Replacement Surgeries at Dr L H Hiranandani Hospital - Exceptional results & Evolvement of techniques for better patient outcome

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The first total knee replacement at Dr L H Hiranandani Hospital was performed on 28th July 2004 on a female patient who had surgery done on both knees at an interval of one week. She stayed in the hospital for a period of three weeks. Considering the type of design and surgical technique and the patient recovery and pain management system prevalent at the time, we have come a long way. Today there is a huge advancement in every aspect, both pre-op and post-op, to get better and quicker outcomes.

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Improvement in Materials and Designs of Joint Replacement Implants

Knee prosthesis in any design is made up of metal and plastic components which can wear out due to quality of polyethylene and surface roughness of metal. Today we have better quality of implants with polished tibial surface mainly with rotating platform designs. Recent cruciate retaining designs have the option of saving bone and internal ligament for further stability. These not only hasten recovery but other activities such as climbing stairs can be achieved quickly.

The Department of Orthopaedics started doing Rotating Platform Hi-flex Knee Replacement in 2005 for the benefit of those who require complete knee-bending. More than 900-knee replacement surgeries have been performed using this technique with excellent results. We were the first to start this technique in India and now are using an improved design with cruciate ligament-saving

knee replacement which further involves significant bone conservation along with high flexion and virtually immediate recovery.

The conventional Hip Replacement prosthesis has both cemented and uncemented version. The main feature for determining longevity of this prosthesis is bearing surface i. e. ball and socket articular area. Wearing out of the plastic (socket) part is key factor for loosening of hip implant. Presently the combination of ceramic on ceramic or metal on metal articular surface with the biggest possible size of femoral head to enable maximum range of movement post surgery is being used. This is the state-of-art in hip replacement technique practiced across the globe. These newer designs permits much improved functional activity level apart from improved survival chances of the implant.

Technology with Computer Navigation

Dr L H Hiranandani Hospital was the first to have this state-of-art machine installed and have performed more than 600 operations using computer-assisted joint replacement technique. Accurate implant alignment and precise ligament balancing is the key factor for longevity of joint replacement.

Quicker Recovery and Shorter Hospital Stay: New Mantra In Joint Replacement Surgeries

In the past, knee surgeries were done with long skin incision and quadriceps muscles were cut to expose the knee joint which led to delay in recovery.

But today, the focus is more on quick recovery and less pain to the patient after the surgery. The skin incision to expose the knee is small, and most importantly, quadriceps sparing 'subvastus' approach is used to perform knee replacement surgery. This technique helps in many ways –

1. Negligible or no pain post-surgery
2. Quicker recovery in terms of physiotherapy, walking and climbing a staircase
3. Minimal usage of walker or stick for support

With faster recovery, the patient-stay in the hospital has reduced with one-side knee replacement patient staying for 2 days and bilateral knee replacement patients for 3 days after the operation.

Bilateral Knee Replacement

Using computer navigation, replacement of both the knees can be done safely in medically fit and motivated patients. This means a single hospital stay, single course of antibiotics and other associated medicines and hence cost-effective.



6 year follow up of Total Knee Replacement



Muscle Sparing Subvastus Approach - Total Knee Replacement Surgery

Patient Specific Jigs for Knee Replacement

Prior to a knee-replacement surgery, patients can now have made-to-order special individual jigs. In this technology, a patient's CT scan is taken and the joint measurements are then sent

to the laboratory in US where the patient's personalized jigs are manufactured within a period of six weeks. Thus, a virtually perfect alignment and bone cuts can be achieved in the operation, leading to superior results with high accuracy and precision.

Revision Joint Replacement Surgery

Failure of a joint replacement could happen due to variety of reasons. Major problem in revision surgery is the existing bone loss and ligament insufficiency. Today there are excellent revision implant systems available and challenges during revision surgeries can therefore be tackled better.

Success, Patient Satisfaction and a Team

A successful operation that will help patients to lead a pain-free and overall excellent quality of life is what we strive for. A combination of minimally invasive muscle-sparing surgery using modern implant and computer navigation, fewer days of stay in the hospital and faster, pain-free recovery has brought all these patients back on the road with a promise of a bright future ahead.

Recent Advancement in the Management of Osteochondral Injuries - Autologous Chondrocyte Implantation

Dr Sanjeev Jain

Osteochondral lesions including Osteochondritis dissecans (OCD) in ankle, knee and elbow are very common sports injuries. An osteochondral injury is an injury to the smooth surface on the end of the bones (articular cartilage) and the bone just underneath it. The degree of injury ranges from a small crack to a piece of the bone breaking off inside the joint. These fragments can be of many sizes and depths and can stay attached (stable) to the area that was injured or become loose (unstable) inside the joint. The prognosis of the resultant articular cartilage defects varies according to age, mechanism of injury, site, size, associated injuries and treatment received.

Causes

The causes of osteochondral injuries are not yet completely understood, but some theories are:

- Direct compressive trauma or repetitive strain
- Lack of blood supply to the affected area
- Heredity

Symptoms

- Pain with weight bearing activities
- Swelling & tenderness over injured area
- Instability of the joint
- Occasional catching and locking of the joint
- Decreased motion

Treatment

Treatment is variable depending upon the size of the bone fragment, age of the patient and activity level of the patient. Skeletally immature patients - patients with open growth plates-typically respond well to conservative treatment.

Conservative Treatment

- Decreasing the pain and inflammation through anti-inflammatory medication
- Ice-application and modified activity
- Rehabilitation to improve strength, flexibility and alignment

Operative Treatment

If the fragment is unstable or loose in the joint, surgery may be necessary to remove and repair the injured area. Operative treatment might also be

necessary if patients do not respond well to conservative treatment. A period of immobilization might be necessary after surgery. Gradual strengthening of the injured joint alongwith activity-specific rehabilitation is the final phase to restore function

Autologous Chondrocyte Implantation

Autologous Chondrocyte Implantation (ACI) is a biomedical treatment that repairs damages in articular cartilage. The goal of ACI is to allow people suffering from articular cartilage damage to return to their old lifestyle by regaining mobility.

How ACI works?

In the first stage, between 200 and 300 mg of cartilage is sampled arthroscopically from a less weight bearing area from either the intercondylar notch or the superior ridge of the medial or lateral femoral condyle of the patient. The matrix is removed enzymatically and the chondrocytes are isolated. These cells are grown in-vitro in a specialised laboratory for approximately 4 - 6 weeks, until there are enough cells to re-implant on the damaged area of the articular cartilage. The patient then undergoes a second treatment, in which the chondrocyte cells are applied on the damaged area during an open-knee surgery. These autologous cells should adapt themselves to their new environment by forming new cartilage. During the implantation, chondrocyte cells are applied on the damaged area in combination with a membrane (tibial periosteum or biomembrane) or pre-seeded in a scaffold matrix.

Post-ACI rehabilitation

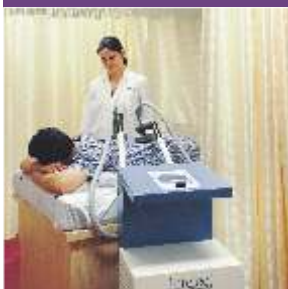
Weight bearing is restricted for 6-8 weeks while the cells adhere to the underlying bone. Motion is encouraged, often with the use of continuous passive movement. Training intensity increases after 3-6 months postoperatively.

Conclusion

From the review of available literature and our experience of the clinical outcome for isolated cartilage defects of the knee using ACI, we can make the following conclusions:

- No current evidence to justify treatment in asymptomatic, small (< 1 cm²) cartilage defects of the knee
- Adult patients with symptomatic full-thickness defects have poor results if not treated
- Instability and mal-alignment require correction
- Smaller, well-contained lesions may be suitable for microfracture, but for patients who do not respond to microfracture, ACI offers a satisfactory alternative salvage procedure
- ACI leads to a statistically significant improvement in objective and patient-reported clinical outcome scores and produces a durable outcome for as long as nine years
- Clinical results of the ACI & MACI (Matrix-induced Chondrocyte Implantation) techniques are comparable
- Finally, the location of the lesion will affect the outcome of the intervention.

Advances in the Department of Physiotherapy & Sports Rehabilitation



The following advanced equipments increase the scope of rehabilitation:

1. ISO Kinetic Multi-joint & Work Simulator:

It is an effective system for muscle-strengthening and work with electrically operated dynamometer that facilitates to simulate, analyse and practice movement pattern with high degree of precision. It helps to measure muscular imbalances, which have damaging effects on joints and sequence of combined movements and works with a biofeedback system, where patients can follow their training displayed on screen in real time.

When patients with little strength are unable to perform a specific action without assistance, the system compensates the external force enabling the patients to perform movement realistically at desired target speed with minimum force. Based on these inputs, individualized exercise regimes are designed for effective rehabilitation.

2. HUR training system:

This is best suited for spine rehabilitation as well as strengthening of muscles of the arms and legs and is based on pneumatic air resistance technology system. It helps to build 'functional fitness' by increasing and maintaining the joint range of motion, strengthening and toning of muscle, increasing static and dynamic endurance. It has smooth adjustment of resistance without any jerk, avoiding overloading of joints and connected tissues, making it more safe and effective training system.

3. Balance Trainer:

In ankle or knee injury, if muscles and tissues do not heal properly, the joints become unstable and prone to injury in future. These programs are designed to strengthen the stabilizing muscles thereby protecting the joint from further injury.

4. Unweighing Harness and Tilt Table:

These are mainly used for neurological rehabilitation wherein stroke patients are ambulated with the help of unweighing harness on treadmill and made to stand and weight bear on their feet with the help of Tilt Table.

5. MTD Balance System:

It is mainly used to improve balance and co-ordination and has a platform that can measure and train balance, symmetry, speediness, strength, capacity as well as coordination. It consists of number of computerized tasking, which enhances the perception, cognition and anticipation. The training by MTD trainer is supported by visual and audible feedback and can be tailored as per patient's body weight and requirement.

6. Various Advanced Pain Relieving Modalities:

Laser Therapy: This is the application of specific wavelengths of light to affected body tissues increasing microcirculation & vasodilatation, reducing inflammation and decreasing pain. It increases tissue proliferation and regeneration, accelerates soft tissue and bone repair, increases tissue tensile strength and enhances nerve regeneration function.

Shock Wave Therapy: It is the application of a high-energy pneumatically (pressure) acoustic (sound) pulses transmitted into the tissue of the affected area of the body. It is an excellent alternative for chronic pain when other treatments fail and is often used as a pre-surgery option. It increases the metabolic activity around the site of pain or discomfort, stimulating the re-absorption of irritant calcium deposits in tendons.

Combo Therapy: It is the application of two therapeutic modalities at the same time and same site. One therapy enhances the effects of the other making the combination more effective than each therapy undergone separately.

Whirlpool Therapy (Hydrotherapy): It is a means of exercising arthritic joints using the buoyancy of water to assist or resist movement. The warmth of the water increases the circulation and helps reduce muscle spasms.

The Department of Physiotherapy at Dr L H Hiranandani Hospital focuses on:

- 1. Orthopaedic Rehabilitation:** Improving the quality of function and activities of an individual who has undergone the surgery or is suffering from muscular and bone disorders like arthritis of joints, sprains and strains
- 2. Spine Rehabilitation:** Strong and flexible muscles help maintain proper posture and prevent back strain
- 3. Physiotherapy in Pain Management:** For the pain relief, the electrotherapeutic modalities like Short Wave Diathermy (SWD), Transcutaneous Electrical Nerve Stimulation (TENS), Infrared (IR) and Interferential Therapy (IFT) are used
- 4. Sports Rehabilitation:** A comprehensive multi-disciplinary approach which deals with all aspects of training, technique, correct biomechanics, proper conditioning, optimizing balance and co-ordination, optimizing reaction time, correct management of external injuries, optimal diet and nutrition, adequate rest and finally positive mental attitude
- 5. Pulmonary Rehabilitation:** For patients suffering from sub-acute or chronic lung conditions to improve the endurance and breathing capacity
- 6. Neurological Rehabilitation:** For patients suffering from stroke, Parkinson's disease, head injuries and trauma



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Platelet-Rich Plasma Therapy in Orthopaedics: Early Indian Experience

Biologics in orthopaedics is progressing at a rapid pace thus allowing introduction of several products for clinical application. Platelet-Rich Plasma (PRP) therapy is fast becoming very popular in this direction. We introduced PRP therapy at Dr L H Hiranandani Hospital in July 2009 for various indications and our indications are fast growing.

Abstract of our Study (Paper submitted)

We studied 39 patients (51 cases) who underwent PRP therapy for various indications. Patients were assessed using visual analogue scale pre-operatively and post-operatively at various intervals. Early results indicate a favourable outcome in all cases. The advantage of this therapy is that it is safe; however, we need to base our PRP indications on high-level science, rather than anecdotal data in the lay literature. As

we better understand indications and how PRP works, we will be able to design more specific formulations.

Our Conclusion

In our experience, patient education has been an issue as most patients compare PRP injection with that of a steroid injection. World over, researchers are still trying to figure out the best formula and indications for PRP. Only over time and with data accumulation and analysis will it be possible to

define treatment guidelines. However, randomized, prospective studies for these innovations should be conducted on large scale to know the safety and efficacy of these technologies. In this direction, we have collaborated with some major institutions in the country and abroad. We hope that the current research trend can lead to an enhancement of tissue regeneration and reduction of degenerative mechanisms.

ENDORPHINS



Individual views

A priest put up a signboard outside his church saying, "I pray for all". A lawyer passing by wrote underneath. "I plead for all". "I prescribe for all", scribbled a doctor. "And I pay for all, damn it!" added a citizen.

A doctor's complaint

A doctor is talking to a car mechanic, "Your fee is several times more per hour than we get paid for medical care." "Yeah, but you see, doc, you have always the same model, it hasn't changed since Adam; but we have to keep up to date with new models coming every month.."



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