Rehabilitation Guidelines for Osteochondritis Dissecans (OCD) Non-operative Care- Knee

Osteochondritis is a condition in which the blood supply to an area of bone is disrupted. As a result, the area of bone and its overlying cartilage can separate from the rest of the bone. This piece of bone and cartilage can become loose and even break off into the joint. It can cause pain and swelling or even a feeling of "catching" or "giving out." Osteochondritis dissecans most often affects the knee, ankle and elbow.

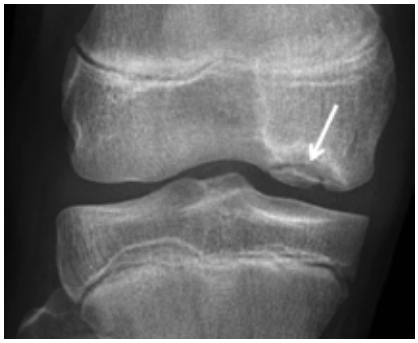

Figure 1 *Radiographic (x-ray) view of an OCD lesion of the knee*

Osteochondritis Dissecans can be seen at any age but it is common in kids and teenagers between 10-15 years of age. Juvenile OCD occurs in kids who are still growing. It is more common in boys than in girls but this may be changing as more girls are playing sports. It is seen in all athletes, including in the elbows of gymnasts and baseball players. The cause of OCD is not completely known there is belief that it is at least partially caused by a change in the blood flow in the bone around a joint that makes the bone sick. Repetitive trauma (loading the joint like in running and jumping for the knee and ankle; or throwing in the elbow) is also thought to play a role in causing OCD.

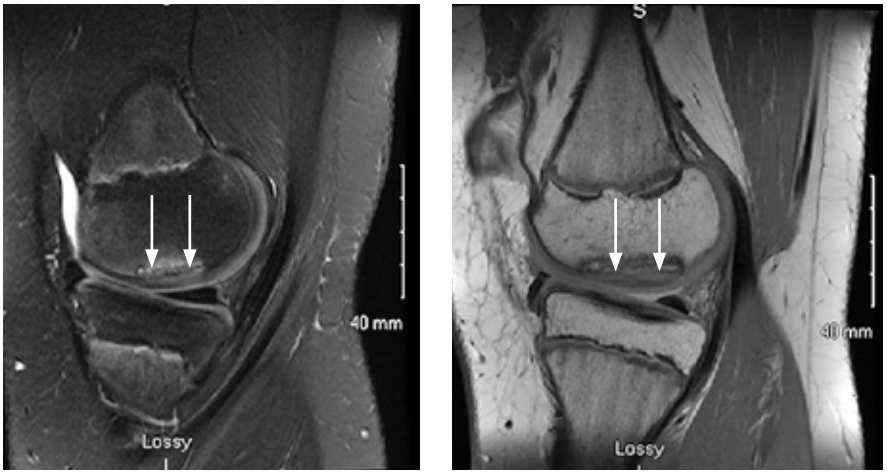

Figure 2 *MRI view of an OCD lesion of the knee.*

OCD usually causes pain in the involved joint. You may also have swelling or stiffness in the joint with pain during or after activity. Sometimes, you might feel like your joint "gets stuck" in a position or it may feel weak. You should see your doctor if you have any of these problems. Your doctor will test your joint and order tests to look at your joint. OCD can often be seen on x-ray (fig 1), but sometimes an MRI is needed to see it. The MRI can also show if the piece could be loose or if it has broken off into the joint (fig 2) causing the joint to not move.

It is possible to heal OCD completely. The younger you are, the better chance you have of healing the OCD and getting back to the activities you enjoy. Sometimes, high impact activities, like basketball, can be difficult to do after OCD. Adults are less likely to be completely cured, even if they have surgery.

Non-Operative treatment

The goal of non-operative treatment is to decrease the load across your joint. This means that you will need to avoid activities like running and jumping (if it's your knee or ankle) or gymnastics and throwing (if it is your elbow). You may need a brace or crutches. This treatment can take from several months to a year or more. The goal of this treatment is to decrease the stress on the bone, allowing blood flow to be restored and the bone to heal. X-rays and/or MRI will be used follow the OCD and see if your OCD is healing.

If the OCD does not heal, if you are finished growing or if the lesion is unstable, surgery will most likely be

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Figure 3 A and B: *A - Depression of the articular cartilage shows the underlying defect. B - Holes drilled for fixation.*

recommended. The goal of surgery is to get the piece of bone to heal. In order to do that, the bone must be healthy and have enough blood supply.

Surgical treatment

An arthroscopic surgery may be done to make small drill holes in the healthier bone around the OCD to improve the blood supply to the OCD piece (fig 3). If the piece is loose, it may need to be held in place with a nail or screw (sometimes, a second surgery will be required to take out screws). Bone from around your other knee (bone graft) is sometimes used if the OCD is very large. After surgery, you will not be able to put all of your weight on the leg (or arm), you will wear a special brace and will do physical therapy. Adherence to your physical therapy program and activity restrictions will significantly affect the long-term health of your joint and your ability to return to sport and activity. X-rays and/or MRI will be used to see whether or not your OCD heals after surgery.

PHASE I (surgery to 8 weeks after surgery)

Appointments	• Rehabilitation appointments 1 times per week
Rehabilitation Goals	• Protect knee to allow for healing • Restore/maintain quadriceps function and leg control • Adherence to home exercise plan (HEP)
Precautions	• Touch down weight bearing (TDWB) with crutches • Hinged brace or unloader brace

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Suggested Therapeutic Exercise	• Heel slides • Seated full arc quad knee extensions • Straight leg raises • Prone leg curls • Bike with little to no resistance • Deep water running with little to no resistance • Heel raises • Lower extremity stretching in non-weight bearing positions NOTE: The focus of this phase should be on high volume low load --2-3 times per day, high reps, minimal resistance
Cardiovascular Exercise	• None at this time, aside from the gentle bike and deep water running

Progression Criteria	• Patients may progress to Phase II if they are 8-12 weeks post-operative AND:
	  • Good quad set and open chain leg control
	  • Full range of motion (ROM) and no swelling/effusion
	  • Normal gait without pain

PHASE II (begin after meeting Phase I criteria, usually 8-12 weeks after surgery)

Appointments	• Rehabilitation appointments are 1 time a week for 1 -2 weeks
Rehabilitation Goals	• Normalize gait • Closed chain leg strength and control for non-impact movement and positions • Adherence to HEP
Precautions	• Weight bearing as tolerated (WBAT) • Avoid over-loading the involved compartment through exercise and activity. • Consider unloader brace or continuation of hinged knee brace if needed. • No active inflammation or reactive swelling
Suggested Therapeutic Exercise	• Gait drills: forward and backward march walk, soldier walk, side step, step overs, hurdle walk • Double leg balance drills - balance board, tandem balance • Closed chain strengthening for quadriceps and glutes - double leg squat progressions and leg press (0-60°ROM and respect weight bearing point of OCD as a component of the progression) • Hip and core strengthening • Stationary bike or elliptical trainer with low resistance - starting at 5-10 min and gradually building up • Aquatic therapy - repeated knee motions such as march walking and bicycle walking
Progression Criteria	• Normal gait including stairs without pain • Symmetric weight acceptance for squats to 45°without pain • No reactive swelling/effusion after exercise or activity

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PHASE III (begin after meeting Phase II critera, usually 12 to 18 weeks after surgery)

Appointments	• Rehabilitation appointments as needed. Usually 1 time every 2-4 weeks
Rehabilitation Goals	• Normal running gait without side to side differences or compensations • Normal double leg landing control without side to side differences or compensations for sub-maximal squat jump • Adherence to HEP
Precautions	• No active reactive swelling/effusion or joint pain during or after activity that lasts more than 12 hours • Less than 25% strength deficit on Biodex, no pain and no swelling prior to initiating impact rehab drills
Suggested Therapeutic Exercise	• Closed chain strengthening for quadriceps and glutes - lunge progressions and single leg squat progressions • Single leg balance exercises and progressions • At ~14-15 weeks initiate low amplitude landing mechanics: med ball squat catches, shallow jump landings, chop and drop stops, etc. • At ~14-15 weeks initiate low amplitude low velocity agility drills: forward and backward skipping, side shuffle, skater's quick stepping, carioca, cross overs, backward jog, forward jog • Core strength and stabilization
Cardiovascular Exercise	• Stationary bike with moderate resistance • Deep water running and swimming • Elliptical trainer
Progression Criteria	• Normal jogging gait • Good single leg balance • Less than 20% deficit on Biodex strength test • No reactive swelling/effusion after exercise or activity

PHASE IV (begin after meeting Phase III criteria, usually 18-24 weeks after surgery)

Appointments	• Rehabilitation appointments are once every 2-4 weeks
Rehabilitation Goals	• Normal multi-planar high velocity without side to side differences or compensations. • Normal double leg landing control without side to side differences or compensations. • Adherence to HEP
Precautions	• No active reactive swelling/effusion or joint pain during activity or after activity that lasts more than 12 hours

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Suggested Therapeutic Exercise	• Progressive agility drills: forward and backward skipping, side shuffle, skater's quick stepping, carioca, cross overs, backward jog, forward jog • Landing mechanics - progressing from higher amplitude double leg to single leg landing drills. Start uni-planar and gradually progress to multi-planar • Movement control exercise beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities • Strength and control drills related to sport specific movements • Sport/work specific balance and proprioceptive drills • Hip and core strengthening • Stretching for patient specific muscle imbalances • Unanticipated movement control drills, including cutting and pivoting
Cardiovascular Exercise	• Progressive running program. Design to use sport specific energy systems
Progression Criteria	• Patient may return to sport after receiving clearance from the orthopedic surgeon and the physical therapist/athletic trainer. Progressive testing will be completed. Patient should have less than 10% difference in Biodex strength test, force plate jump and hop tests and functional hop tests

These rehabilitation guidelines were developed collaboratively by UW Health Sports Rehabilitation and the UW Health Sports Medicine Physician group.

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