

ORTHOARIZONA

Shelden L. Martin, M.D.

Microfracture, Mosaicplasty and Osteochondral Autograft Transplant (OATS) Protocol

There are various treatment options for the treatment of osteochondral injuries to the knee. The primary objective of any treatment protocol is to protect the repair/graft site and promote optimum conditions for healing to occur. Progression is based upon the understanding of surgical techniques, location of defect and/or graft site, tissue quality, healing restraints and their ability to tolerate load.

Microfracture: is a marrow stimulation technique with subchondral penetration which promotes a fibrin clot and the replacement of fibrocartilage into the defect.

Mosaicplasty: osteochondral transfer procedure in which numerous small “dowels” (4-6 mm plugs) of autologous bone and articular cartilage are transplanted from minimal weight bearing regions to the defect site.

OATS: osteochondral transfer procedure in which one or two larger (5-10 mm) plugs of autologous bone and articular cartilage are transplanted from a minimal weight bearing region to the defect site.

This protocol is a general guideline and may be altered to accommodate specific surgical techniques, complications and/or tissue quality. Progression is based upon healing times as well as functional progression. In advancing treatment variables the patient is closely monitored for increase pain and effusion which may indicate the repair site is unable to tolerate the stress loads placed upon it.

Recommendations: (4-6 weeks)

NWB 4-6 weeks

TDWB progressing to WBAT as normal gait pattern is achieved (6 weeks).

ROM to tolerance

Per physician preference, either home use of CPM or the patient performs a minimum of 500 cycles of ROM per day.

Although hyaline/fibro cartilage requires movement to promote healing, care is taken to avoid the detrimental shear/rotational stresses with weight-bearing until 6-8 weeks.

Program:

Weeks 1-6: NWB with progression to TDWB (4-6 weeks) with maintaining 2 crutches
Hold on progressing to WBAT until 6 weeks and patient must demonstrate a normal gait pattern, minimal effusion (1-1.5 cm) and demonstration of adequate quad control.

AROM to tolerance

Ice and Elevation, 3-4 times a day

Biofeedback or Electrical stimulation for muscle re-education
Patella mobilization
Isometrics for Quads, hip abductors and adductors
Straight leg raises (SLR) adding weight as able (absence of SLR lag)
 Hip Flexion, Abduction, Adduction and Extension
Lower extremity flexibility program
Control knee effusion as needed
Active Knee extension in painfree range (monitor patellofemoral complaints).
If patella/trochlea involved hold on **resistive** knee extension until 8 weeks.
Hamstring curls in pain free range
Progression to multi-hip machine

Weeks 6-8: ROM - Achieve full ROM by 6 weeks
 Bike, pool, wall slides
Balance training on involved leg
 Eyes open, eyes closed
 Rocker board; progress to BAPS (PWB initially then FWB standing at 8 weeks)
 Single leg balance, balance reach, etc. when allowed
 Ball throws
Endurance training
 Light bike work as ROM allows
 Re-evaluate patello-femoral complex and address any dysfunctions
 Closed chain strengthening exercises (PWB to FWB)
 Squats, lunges, calf raises, leg press, step downs, sports cord, etc.

Weeks 8-12: Progressive resistance on Isotonic machines
Isokinetics
 High speeds 150-300 degrees/second
Increase endurance activities
 Increase resistance on the bike, pool, Elliptical, Versaclimber, walking,
 No Running until 4-6 months
Advance closed chain exercises to unsteady surfaces (pillow, half foam roll, BAPS board) as lower extremity muscle control allows

12 weeks: Full lower extremity biomechanical evaluation to address influence and/or “weak links” from hip and foot/ankle.
Continue strengthening exercises three times per week
Continue flexibility exercises daily

4-6 Months: Jogging (begin with 1 mile jog/walk and increase in 1/4 mile increments, based upon pain and effusion)

Once patient is able to jog 20 minutes (2-3 miles) with no discomfort or swelling
may progress functional activities to include figure 8's, cutting, jumping, etc..

Sport specific activities (progressing as tolerated)
Backward running, carioca, ball drills & other sport skills

Criteria For Return to Sports:

Adequate healing time

Full pain free ROM

No effusion

Normal isokinetic evaluation and function tests

Satisfactory performance of sport specific activities without swelling