

Knee Osteoarthritis Treatment Algorithms

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Osteoarthritis

- Degenerative joint disease
- Failure of cartilage and surrounding tissue.
- Formation of ectopic bone and osteophytes
- Complex multifactorial joint pathology caused by inflammatory and metabolic factors resulting joint damage.
- Neuroinflammation and central sensitization mechanisms causes chronic pain



Etiology

- OA can be primary or secondary.
- Posttraumatic
- Malposition –varus, valgus
- Postoperative
- Metabolic



varus



valgus

Symptoms

- Pain
- Decreased ROM
- Crepitaiton
- Swelling

Grade 1



doubtful JSN and possible osteophyt

Grade 2



definite osteophytes and possible JSN

Grade 3



multiple osteophytes, definite JSN, sclerosis, and possible bony deformity

Kellgren JH, Lawrence JS. Radiological assessment of osteo-arthritis. *Ann Rheum Dis.* 1957 Dec;16(4):494-502

Grade 4



large osteophytes, marked JSN, severe sclerosis, and definite bony deformity

Kellgren JH, Lawrence JS. Radiological assessment of osteo-arthrosis. *Ann Rheum Dis.* 1957 Dec;16(4):494-502

Laboratory

- CRP
- Hemogram
- Sedimentation
- RF

- MRI demonstrates the hyaline cartilage
- Bone scanning, assess metabolic activity in the subchondral bone
- Ultrasonography to demonstrate the soft tissues

Conservative

- First time with knee pain and signs of knee OA.
- Heat and cold treatments
- Weight loss
- Muscle strengthening exercises
- Orthotics
- NSAID- are not appropriate for patients with comorbidities or for long term use because of the increase in the risk of adverse events. da Costa B
- Glucosamine

R, Pereira T V, Saadat P, Rudnicki M, Iskander S M, Bodmer N S et al. Effectiveness and safety of non-steroidal anti-inflammatory drugs and opioid treatment for knee and hip osteoarthritis: network meta-analysis *BMJ* 2021; 375 :n2321 doi:10.1136/bmj.n2321

- Hyaluronic acid injection- low risk of harm while providing potential pain reduction and improvement in physical function. There are no existing data that the HA injections will cause regression of osteophytes, subchondral bone remodeling, or regeneration of cartilage and meniscus in patients with bone and cartilage damage.

Evaniew N, Simunovic N, Karlsson J. Cochrane in CORR®: Viscosupplementation for the treatment of osteoarthritis of the knee. *Clin Orthop Relat Res.* 2014 Jul;472(7):2028–34.

- PRP- safe

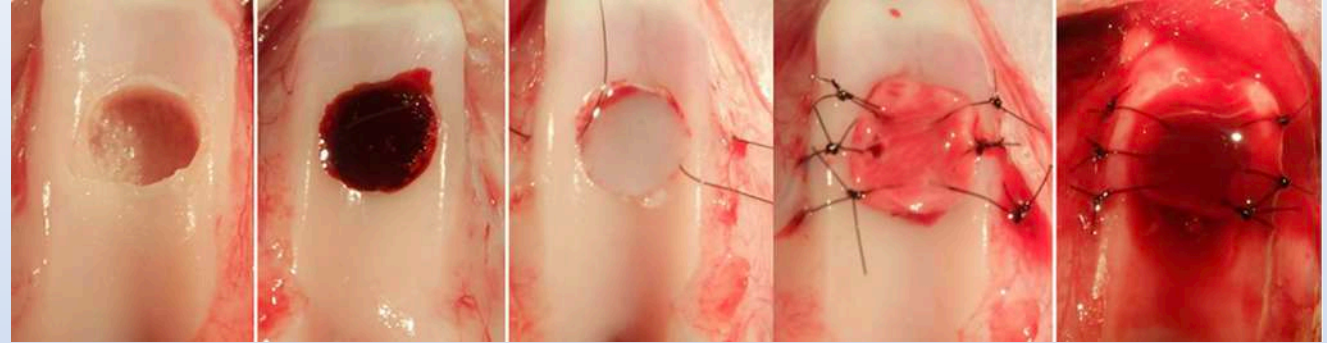
Surgical options

- Arthroscopy
- Cartilage repair
 - Debridment
 - Reparative (marrow stimulation) microfracture
 - Restorative
 - Autologous chondrocyte implantation (ACI)
 - Particulated juvenile allograft cartilage transplant (PJAC)
 - Reconstructive (osteochondral grafting)
- Osteotomies
- Knee replacements



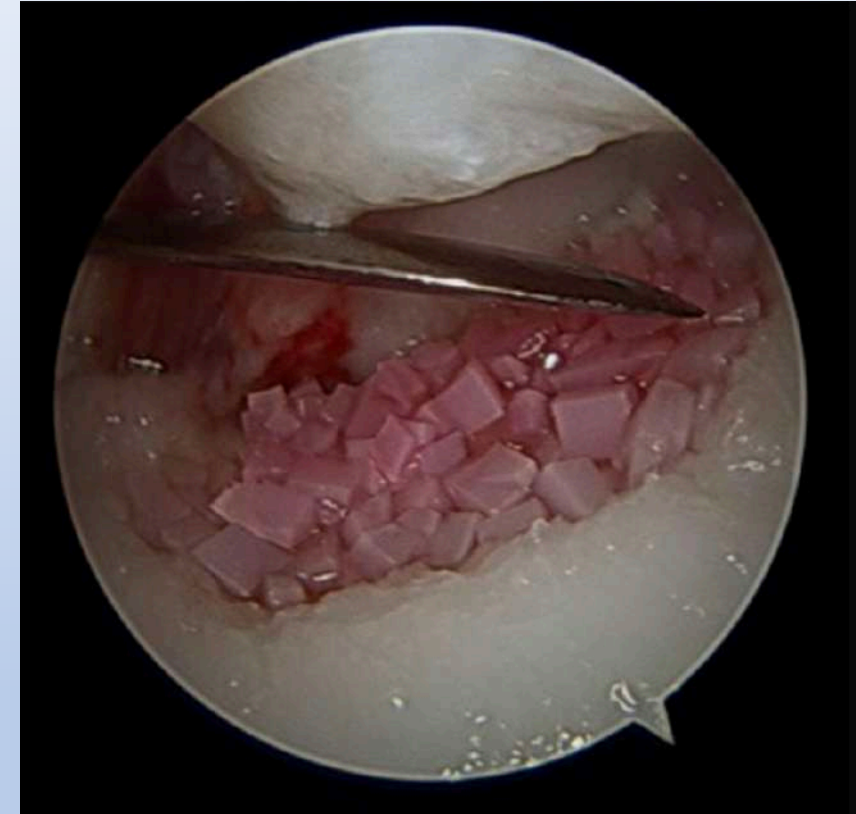
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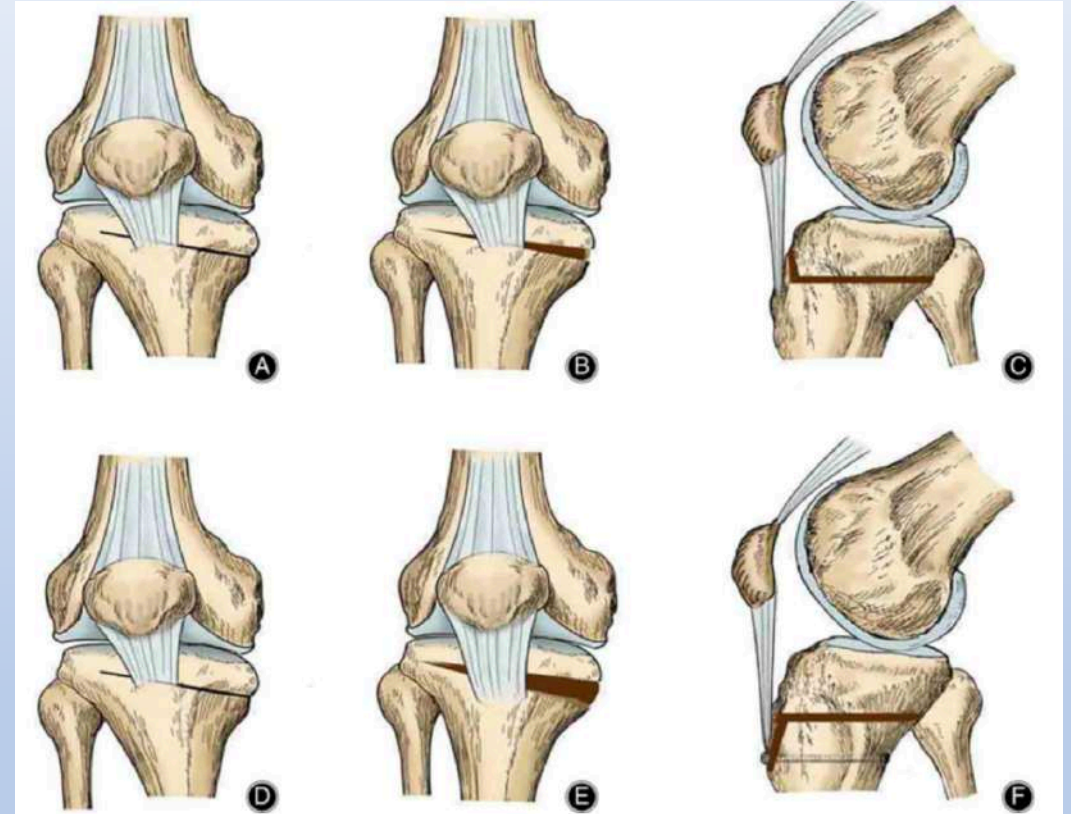


High tibial osteotomy

- Correct deformities to prevent progression of OA
- Medial unicompartmantal OA
- Young
- Combine with cartilage repair procedures
- Active patients
- Non-obese
- One compartment OA
- obese patient BMI>35
- flexion contracture >15 degrees
- knee flexion <90 degrees
- procedure will need >20 degrees of correction
- patellofemoral arthritis
- ligament instability

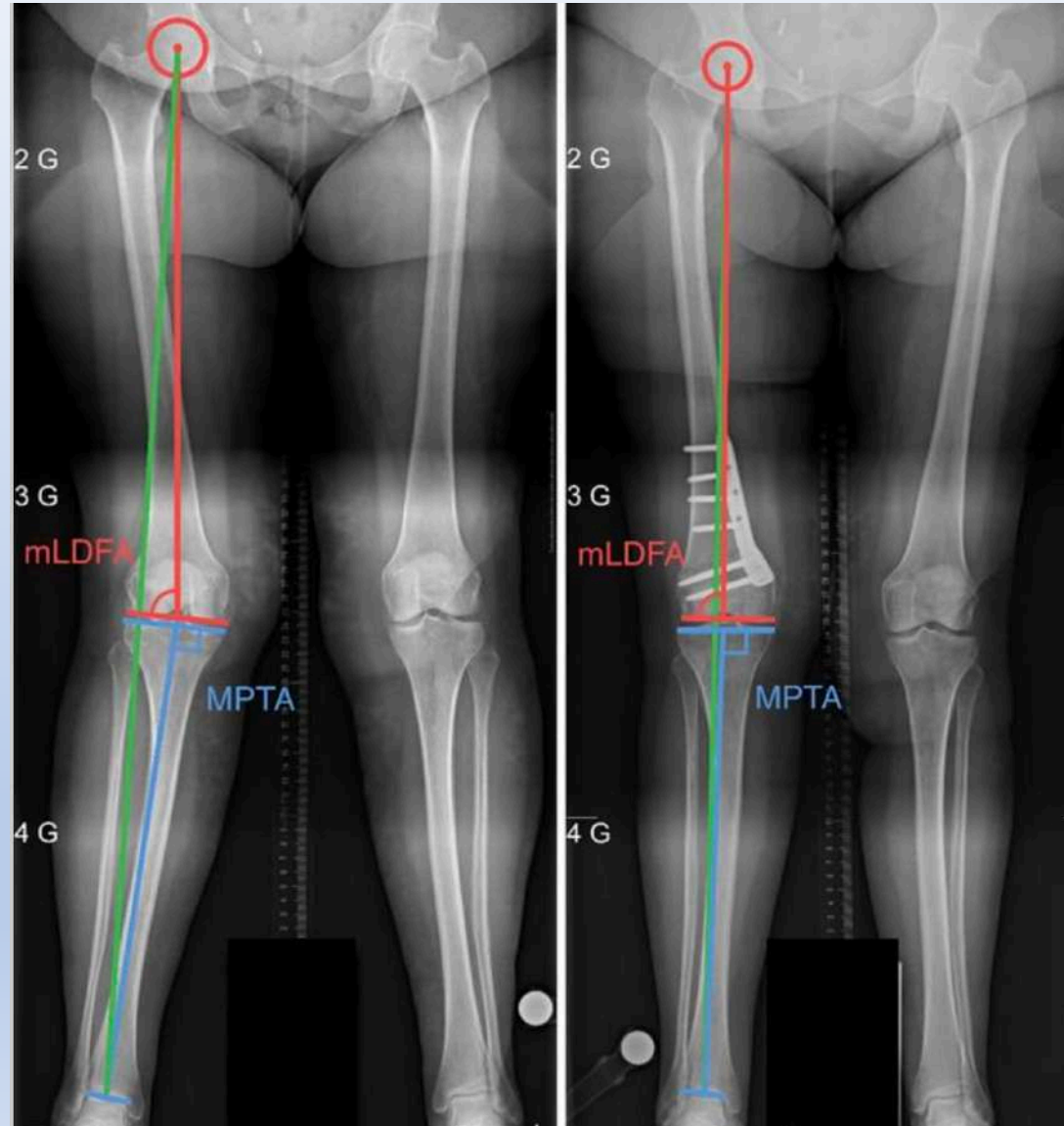
• High tibial osteotomy

- Neurovascular complications
- Fracture
- Delayed union and nonunion
- Infection
- Thromboembolic disease
- Compartment syndrome
- Under correction and recurrence of deformity



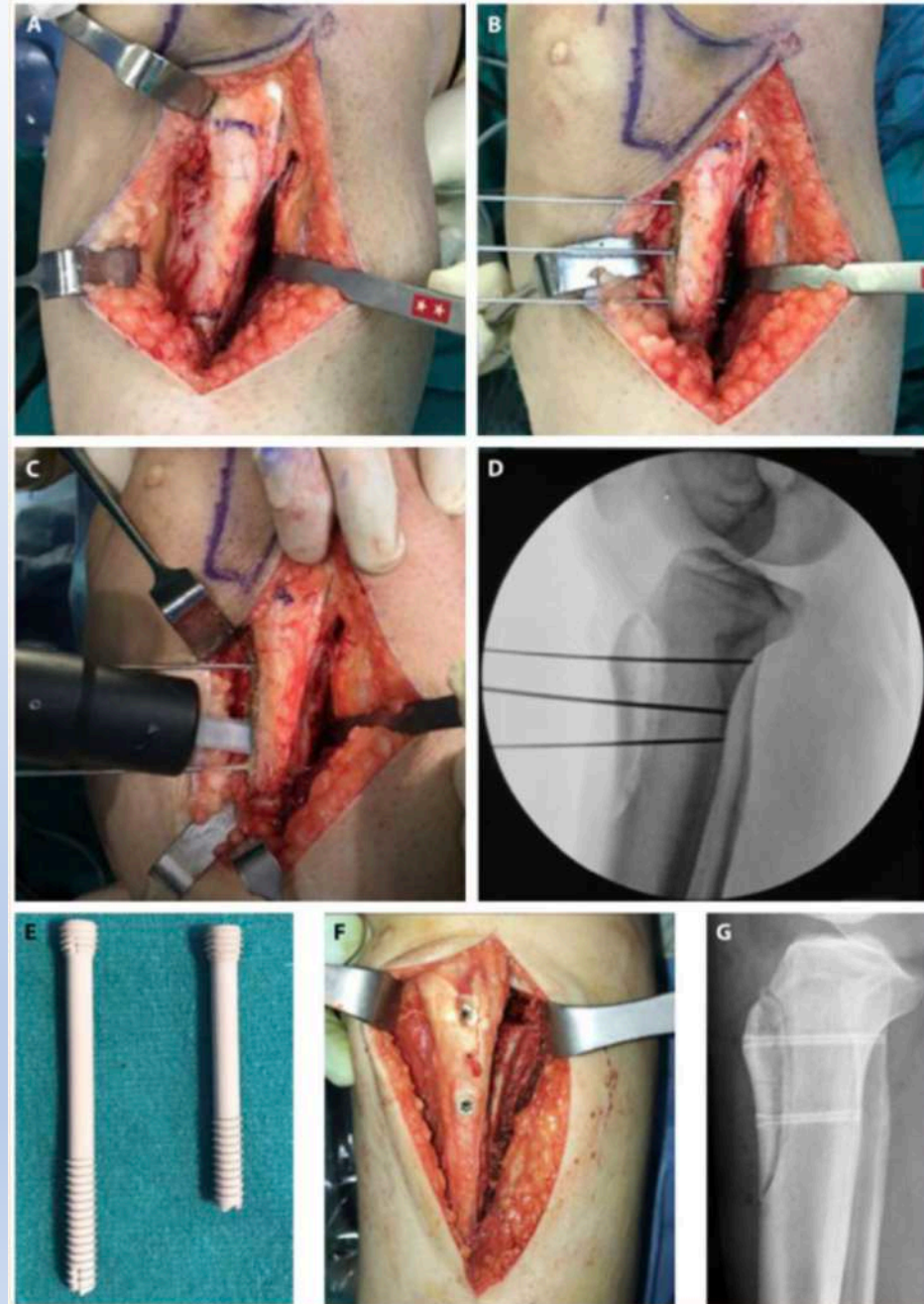
Distal femoral osteotomy (DFO)

- DFO is a reasonable treatment for lateral osteoarthritis in younger patients to avoid disease progression and the need for an TKA. However, there is a long rehabilitation time, a considerable risk for complications, and a high need for hardware removal.



Tibial tubercle osteotomy

- Patellar alignment
- Patellar OA



Unicompartmental knee arthroplasty

- Commonly used in the treatment of isolated end-stage anteromedial osteoarthritis
- Alternative to TKA and osteotomies
- ACL deficiency
- Fixed varus deformity > 10 degrees
- Fixed valgus deformity > 5 degrees
- Range of motion $< 90^\circ$
- Flexion contracture of $> 5-10^\circ$
- Previous meniscectomy
- Patellofemoral OA



- Unicompartmental knee arthroplasty complications
 - Intraoperative fractures, ligament tears
 - Infection
 - Stress fractures
 - Loosening
 - Avascular necrosis
 - Revision rates are more than TKA.

Total knee arthroplasty

- Severe OA
- Deformity
- AVN
- Pain after HTO



- Chronic knee infection
- Vascular diseases
- Extensor mechanism disfunctions

Causes Revision TKA

- Infection
- Aseptic loosening
- Periprosthetic fracture
- Instability
- Polyethylene wear

