

ALIGNMENT: "What can I do to correct it?"

CONSERVATIVE MEASURES

- Activity modification
- Weight loss
- Physical therapy
- NSAIDS
- **Unloader Brace...**



Surgery....

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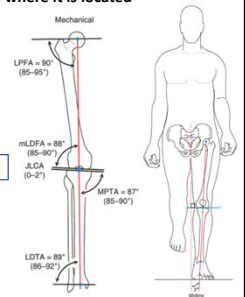
Step 1: Understand the deformity, and where it is located

1. Draw mechanical axis
2. Measure

mPTA typically 87 (85-90) **TIBIAL DEFORMITY**

mLDA typically 88 (85-90) **FEMORAL DEFORMITY**

JLCA – look for instability



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Osteotomy Indications

- Malalignment + Arthritis
- Malalignment + Chronic instability
- Malalignment + Cartilage injury/Restoration
- Malalignment + Meniscal deficiency

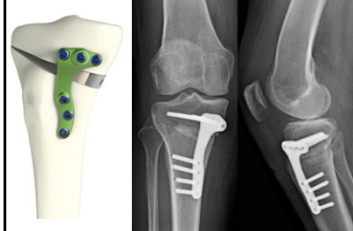
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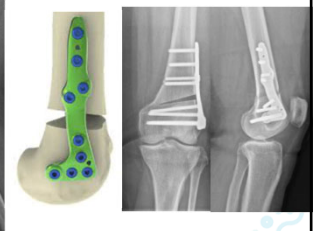
ALIGNMENT:

Step 2: Know your surgical options

High Tibial Osteotomy



Distal Femoral Osteotomy



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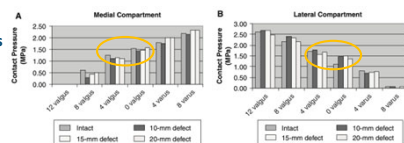
WHY DO WE DO IT?? Because it works

Effect on joint load

- Osteotomy effective for unloading compartment pressures
- Equally distributed contact pressure between M and L compartments at 0-4° valgus
- Improved biomechanics
- Improved patient outcomes

High Tibial Osteotomy for Unloading Osteochondral Defects in the Medial Compartment of the Knee

Curtis Mina,¹ MD, MBA, William E. Garrett, Jr.,¹ MD, PhD, Ricardo Pietrobon,¹ MD, PhD, Richard Gleason,² and Laurence Higgins,¹ MD
From the Hospital for Special Surgery, New York, New York,¹ Duke University Medical Center, Durham, North Carolina, and ²Birmingham Women's Hospital, Boston, Massachusetts



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Outcomes- Does AGE matter?

- Acceptable survival rates of HTO at 10 and 15 years
- Several pre operative risk factors for survival rate suggested, including **age**
- **Age remains controversial**

Patient reported outcomes after high tibial osteotomy show comparable results at different ages in the mid-term to long-term follow-up (JOS, 2019)

- 158 patients - 99% at 5 yrs, 95% at 10 yrs, 85% at 15 yrs
- No difference in failure in those <64 or >65
- Reduced activity score in older patients
- "there is **no one age** that should be used as a cut off..."

Older age increases the risk of revision and perioperative complications after high tibial osteotomy for unicompartmental knee osteoarthritis (JOS, 2021)

Sun-Ho Lee,¹ Hyung-Yeon Seo,¹ Hae-Rim Kim,² Eun-Kyoo Song,³ and Jong-Kyun Seon^{2,3}

- Database study of 61,145 patients (Korean National Insurance Database)
- <60, 60-65, >65 age groups → increased revision rate and complication rate in Groups B and C (>age 60)

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HOW OLD IS TOO OLD?



My practice

- Depends on the **patient** → Typically ages 18-55
- Need to look at the **whole picture**- what are we dealing with, and what are we trying to achieve
- Set appropriate **expectations**
- A word on total knee after osteotomy....

Total Knee Arthroplasty After High Tibial Osteotomy Results in Excellent Long-Term Survivorship and Clinical Outcomes

Chalmers, Brian P. MD; Limberg, Alton K. BS; Tibbo, Meagan E. MD; Perry, Kevin I. MD; Pagano, Mark W. MD; Abdel, Matthew R. MD

The Journal of Bone and Joint Surgery 10(10):949-958, June 5, 2018 | DOI: 10.2106/JBJS.18.01060


- Excellent long term durability, 97% survivorship at 10 years
- reliable improvements in clinical outcomes
- Can make TKA more technically challenging

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REHAB AFTER OSTEOTOMY PROCEDURE

Opening wedge osteotomy



6 weeks FF TDWB, then progress

Closing wedge osteotomy



2 weeks TDWB
2 weeks PWB
2 weeks WBAT in extension with brace

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REHAB AFTER CARTILAGE PROCEDURE

Chondroplasty/Abrasion arthroplasty	WBAT, ROMAT
Microfracture +/- Augmentation	NWB 8 wks, prog ROMAT
MACI (Matrix associated chondrocyte implantation)	*NWB 6 wks, 0-30, prog ROM
OATS (Autograft)	NWB 4 wks, PWB 2 wks, ROMAT
OCA (Allograft)	NWB 6 wks, WBAT

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MACI

- Two – stage surgery, replacing ACI
- Cell based treatment – surface lesions
- membrane impregnated with patient's immature chondrocytes transplanted to defect
- Good short/mid term results
- ? Long term outcomes
- Excellent in PF joint.
- Large lesions
- BAD: Two surgeries, extremely high cost

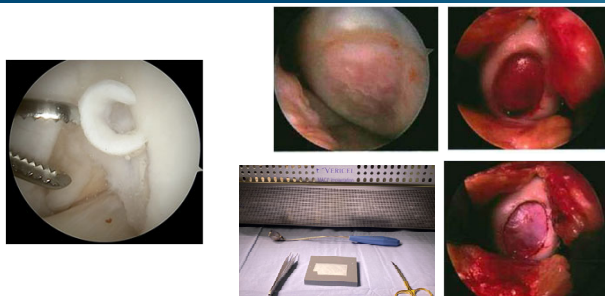
* Am J Sports Med. 2017 Apr;45(4):754-63. doi: 10.1177/0363546516660476. Epub 2017 Jan 20. Clinical and magnetic resonance imaging-based outcomes to 5 years after matrix-induced autologous chondrocyte implantation to address articular cartilage defects in the knee. Jay B Olson, William B Robertson, Jennifer Woodhouse, Michael Feller, Yi-Hi Zheng, Timothy Anderson, David Hwang

outcome measures. At 5 years after surgery, 98% of patients were satisfied with the ability of MACI surgery to relieve knee pain; 86%, with improvement in their ability to perform normal daily tasks; and 73%, with their ability to participate in sport 5 years after MACI.

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Osteochondral Allograft Transplantation



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Osteochondral Allograft Transplantation

- Single stage
- Donor From FRESH LIVING CARTILAGE (donor-match)
- No Limits... SIZE, DEPTH, LOCATION
- Large lesions – no size constraints
- Can be used in all parts of the knee...
- Soak in BMAC for incorporation
- Bone procedure for cartilage problem → Requires osseous integration
- SURVIVORSHIP (Chahla 2016)
 - Condyle: 75% at 15, 67% at 20
 - PF Joint: 100% at 5, 65% at 10

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Osteochondral Allograft Transplantation

The Data...

Osteochondral allograft transplantation of the knee in the pediatric and adolescent population
Ryan T. Mowbray, Andrew T. Parnock, William D. Hughes | AJSM 2016

Osteochondral Allograft Transplantation of the Femoral Trochlea
James J. Cameron, Pamela A. Pridemore, Julie C. McCauley, William D. Hughes | AJSM 2015

Do Outcomes of Osteochondral Allograft Transplantation Differ Based on Age and Sex? A Comparative Matched Group Analysis
Kenneth M. Lin, MD, Dean Wang, MD, Alissa J. Burge, MD, Tyler Warren, BS, Kristofer J. Jones, MD, and Wiley J. Williams, BS, MD | OJSM 2020

PEDS 88% success at 8 years

TROCHLEA 91% survived at 10 years, 89% extremely satisfied

AGE Age >40 did just as well as <40

PATELLA Short term improvement in pain and PRO

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Osteochondral Allograft Transplantation

REVISION

HEMI-CONDYLE

TROCHLEA

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PATELLA

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Questions?

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