INTRODUCTION
i. Osteotomies are the traditional treatment of localized medial/ lateral compartment knee arthrosis with varus / valgus mal-alignment
   b. Objective is to redistribute the mechanical load across the joint
      b. Historical indications of HTO (Coventry et al. JBJS (A), 1985)
         - Stable knee with no subluxation or thrust
         - ROM of at least 15 – 100°
         - Localized medial compartment OA
         - Minimal or no PF symptoms
         - < Than 65 years of age
      c. Contraindications (historical)
         - Unstable knee
         - Tri-compartmental OA
      d. Indications have expanded (Bousquet, Dejour, Noyes, Fowler, Laprade)
         - Posterior/ PL instability
         - ACL deficiency
         - tibial slope in sagittal instabilities

AUTHOR’S INDICATIONS for INSTABILITY (CURRENT)
Author’s indications for HTO in instabilities
Posterolateral or lateral laxity + varus alignment ± thrust
Cruciate deficiency + varus alignment ± thrust
Combined ligamentous laxity + varus alignment ± thrust
Consider sagittal correction for repeat failures of cruciate reconstruction (ACL or PCL)

PREDISPOsing FACTORS
i. Pre-existing pure valgus or varus
ii. Loss of neuromuscular control (usually associated ligament injury and loss of proprioceptive feedback)
iii. Abnormal sagittal slope
iv. tibial slope reduces posterior subluxation and hyperextension, i.e., PCL, PL laxity
   1. tibial slope reduces anterior subluxation, i.e. ACL deficiency
v. Triple varus knee
vi. Unicompartmental degeneration (usually post meniscectomy knee)
The Role of Osteotomy in Knee Instability
A. Amendola, MD

D. PRE-OPERATIVE PLANNING
   a. Detailed Clinical Exam
      i. Joint line tenderness
      ii. Gait - look for thrust
      iii. Stance - limb alignment in single, double stance
      iv. Look for "double or triple" varus knee associated with ACL deficiency, hyperextension PL thrust for PL /PCL
      v. Stability tests: Lachman, pivot shift, anterior & posterior drawer, reverse pivot shift, external rotation tests

   b. Radiographs and Alignment
      i. Single leg standing AP hip to ankle most important – dynamic assessment
      ii. Assessment Of Alignment (preoperative)
         1. Mechanical axis: - measures deviation in weight-bearing line
         2. Generally avoid overcorrection in younger patient or associated instabilities; correct to 62% or just lateral to lateral spine
         3. In severe OA, overcorrection into lat compartment may be justified
         4. Direct measurement intra-operatively with fluro important
         5. Posterior Tibial Slope: - bony slope 0 - 10°
         - Soft tissue (articular) slope is less
      iii. Caution
         1. Severe deformity: accuracy of correction more difficult
         2. Osteoporosis: fixation and healing issues
         3. Other risk factors i.e. smoking, prednisone

E. OSTEOTOMY FOR CRUCIATE INSTABILITY
   i. Usually indicated for medial compartment overload, lateral thrust with ACL /PCL deficiency
   ii. Sagittal correction not clear when indicated but can be incorporated into coronal correction

F. OSTEOTOMY FOR LATERAL / POSTEROLATERAL INSTABILITIES
   i. Usually for varus/posterolateral thrust, medial compartment overload
   ii. Usually tibial correction
   iii. Prefer medial opening wedge osteotomy

G. OSTEOTOMY FOR MEDIAL (valgus) INSTABILITIES
   i. Usually for medial /valgus thrust, lateral compartment overload
   ii. Usually femoral correction, although tibial is OK for smaller corrections
   iii. Prefer lateral distal femoral opening wedge osteotomy, or tibial medial closing wedge.

H. SUMMARY
   i. Correction of malalignment is an essential component in the management of the young patient with ligamentous instability.
ii. Osteotomy should precede or be performed at the same time as ligamentous reconstruction.

iii. In the less active patient often realignment alone will functionally stabilize their knee.

I. References


