

Medial Approaches

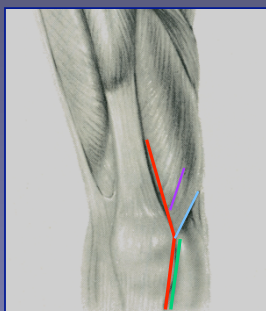
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TKA and Uni

- Good results: function and pain
- Need a good exposure for better placement of instrumentation and components
- Majority: Medial approach
- Usually a parapatellar arthrotomy
- Some prefer subvastus or midvastus

Different approaches

- **Medial parapatellar approach**
- **Subvastus**
- **Midvastus**
- **Mini medial parapatellar approach**
 - "Quad-sparing"



Medial parapatellar approach (MPA)

- Classic early description of the medial parapatellar approach to knee surgery credited to:
 - von Langenbeck B: Zur resection des kniegelenke. Verh Dtsch En Geseuch F Chir 7:23, 1879.
- Directly detaching vastus medialis from its insertion and continuing the arthrotomy along the medial aspect of the patella

Medial parapatellar approach (MPA)

- Midline capsular incision that divides the quadriceps tendon in its medial 1/3 and peels the quadriceps expansion from the patella (Insall)
- This approach is the most popular approach for TKA

MPA: technique

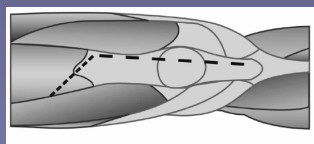
- Straight anterior midline skin incision
- Extending 8 cm proximal to the superior pole and 2 cm distal to the patellar tendon insertion
- Insall preferred the straight midline arthrotomy because it minimizes the disruption of the vastus medialis attachment to the patella.
 - Insall JN: A midline approach to the knee. J Bone Joint Surg 53A:1584-1586, 1971.
- Once the arthrotomy is made, the patella is everted and the knee is flexed.
- Closure is accomplished by anatomic reapproximation with simple sutures placed in an oblique fashion to exploit the vector pull of the vastus medialis muscle.



From Scuderi et al.

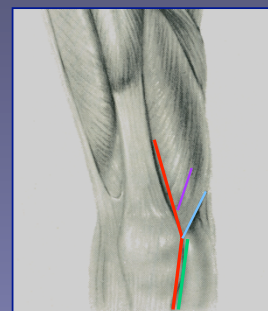
MPA = popular

- Familiarity, simplicity, excellent exposure
- Applied to almost any deformity
- Ability to add a quadriceps snip



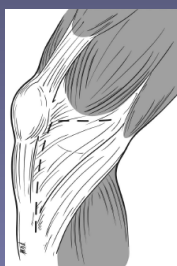
Different approaches

- Medial parapatellar approach
- Subvastus
- Midvastus
- Mini medial parapatellar approach
 - "Quad-sparing"



Subvastus approach

- Introduced by Hofmann et al. (1991)
- Straight anterior midline skin incision: 3/4 cm above the patella, 2 cm distal and just medial to the tibial tubercle
- Medial capsular incision
- Attachment of the vastus medialis obliquus (VMO) to the quadriceps tendon and upper patellar bone is left intact



Subvastus approach

- Attachments to capsule and retinaculum (finger dissection)
- Complete synovial release of the suprapatellar pouch: patellar subluxation
- Dissection of the VMO belly off the intermuscular septum: release tension on the patellar tendon insertion

Subvastus approach advocate

- More anatomic,
- Takes advantage of natural planes of dissection
- Preserve the entire extensor mechanism, minimizing patellofemoral instability and maltracking
- Vascularity maintained, even when coupled with a lateral release by preserving the descending geniculate artery
- Closure is anatomic
- Less PO pain and stronger extensor mechanism
 - Faure 1993, Engh 1997, Chang 2002

Subvastus approach

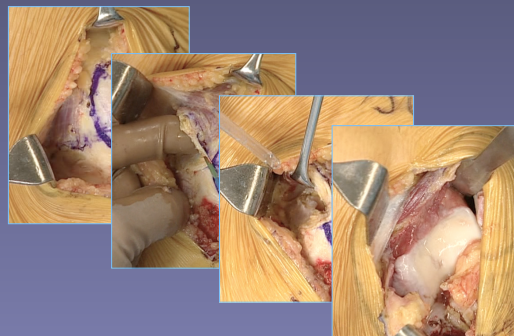
- Criticisms: Unpredictable exposure, difficulty with eversion of the patella
- CI: obesity, muscular thighs, stiffness, revision TKA, previous HTO, patella infera, excessive valgus knees
- Anatomic limits: roughly 10 cm from the adductor tubercle = adductor hiatus and passage of the femoral vessels into the posterior thigh
- Subvastus region: descending geniculate artery and its branches, intermuscular septal arteries and saphenous nerve



Mini subvastus

- 10 cm to 14 cm anterior midline skin incision
- Limited release of the VMO from the intermuscular septum
- Initial patellar subluxation, then bone cuts allow for decompression and reduced tension on the extensor mechanism

Subvastus approach

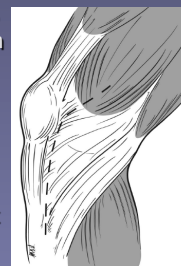


Midvastus Approach

- Compromise between the exposure of medial parapatellar approach and the extensor mechanisms benefits of a subvastus approach
- Engh et al. 1997
- Quality of the medial capsular repair

Midvastus Approach

- Anterior midline skin incision 3 cm above the patella and 3 cm distal to the joint line
- VM divided in line with its muscle fibers
- Start to the superomedial corner of the patella
- Proximally extending for about 4 to 5 cm



Midvastus advantages

- Decreased PO pain
- Preservation of patellar vascularity
- Improved patellar tracking and stability
- Better PO quadriceps control, strength
- Facilitation of rehabilitation
- Decreased blood loss
- Complete eversion of the patella

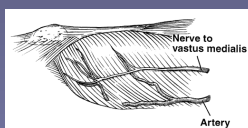
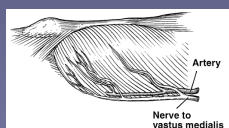
Midvastus disadvantages

- Some difficulty with full exposure / MPA
- Problems or CI: Excessive weight, limited knee flexion, robust extensor mechanism, hypertrophic arthropathy
- Abnormal EMG denervation postoperatively, long-term clinical significance unknown
 - Parentis et al. 1999
- Others: no EMG changes
 - Dalury, 2004

Anatomic Consideration of Nerve Supply to the Vastus Medialis in Knee Surgery

Hiroshi Iojima, MD^{*}; Leo A. Whiteside, MD[†]; and Kosuke Ogata, MD[‡]

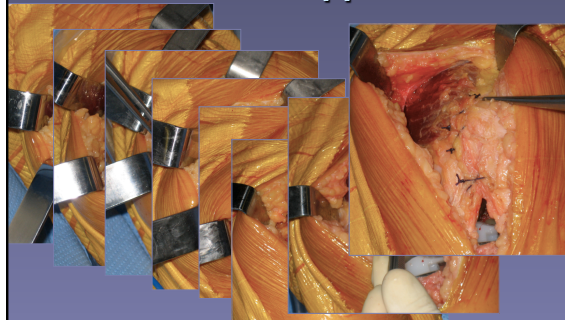
CLINICAL ORTHOPAEDICS AND RELATED RESEARCH
Number 423, pp. 157-160
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Mini midvastus approach

- 10 cm to 14 cm skin incision
- Release of the VMO fibers through a small skin incision

Midvastus Approach

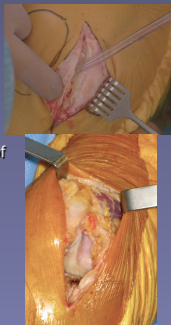


Mini parapatellar

- One part of the parapatellar arthrotomy
- 10 cm to 14 cm anterior midline skin incision (in extension)
 - From superior aspect of the tibial tubercle to the superior border of the patella
- Creation of medial and lateral flaps exposes the extensor mechanism

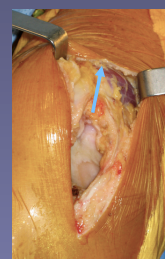
Mini parapatellar

- Limited medial parapatellar arthrotomy
- Skin incision more medially
- The superior incision start at the superomedial corner of the patella
- If necessary, extension proximally
 - Scuderi et al. (2004): 2 cm to 6 cm division of the quadriceps tendon
- Create a "mobile window"
- Bone cuts allow better exposure
- Patella is not everted
- Simple closure



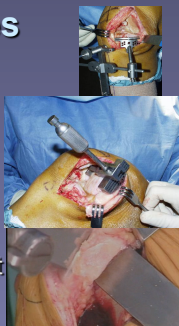
Mini parapatellar advantages

- Quadriceps sparing when possible
- Possibility to extend proximally
- Diminshed progressively the length of incision for the same surgeon
- Learning curve



Mini parapatellar disadvantages

- Modified instruments are required
 - reduced, oblique angle, extra-medullary...
- If necessity of proximally extension: not a preservation of quadriceps
- Patellar preparation is difficult
- Skin necrosis!



Discussion

- MIS has some potentiel advantages
- The choice depend on comparasion between the techniques, the indications and contraindications and the surgeon experience
- But there is some pitfalls and limits...

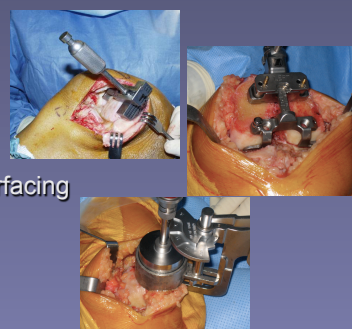
Discussion

- A compromised soft tissue envelope will limit the ability to do a MIS
- Deformity or poor motion should limit
- Size of the femur, high of the patella
- Obese and muscular patients
- Need an appropriate patient selection



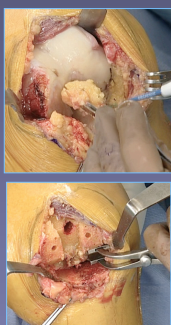
Discussion

- Femoral cuts
- Patellar resurfacing



Discussion

- Fat Pad
- Gaps



Subvastus: our choice

- Real non invasive approach: no muscle or fibers section
- Vascular and nerve preservation / MidV
- Allows good window for surgery / QuadS
- Allows good implant placement / QuadS
- Allows patella resurfacing / QuadS

Conclusion

- Is MIS still popular in the orthopedic community?
- Appropriate position of the implants with correct ligament balancing → Success of the surgery

Thank you

