Arthroscopic Techniques We All Should Know –
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1. **Subtalar joint.**
   a. **Anatomy** [7]
      i. Sural nerve lies lateral to the joint and superficial branch of the peroneal nerve branches lie dorsal
      ii. The axis of the joint is over the tip of the fibula
      iii. The posterior facet only can be reached by arthroscopy
      iv. The posterior process of the talus and the os trigonum lie posterior
      v. The FHL tendon lies on the medial side and runs through a fibro osseus tunnel just medial and anterior to the tibial nerve
   b. **Indications**
      i. Excision of an os trigonum
      ii. Impingement of a lateral process fracture
      iii. Chondral injury
      iv. Fracture [9]
      v. Fusion
      NB: there are two approaches – prone and lateral – the lateral approach is described as it can be combined with triple arthrodesis and ankle arthrodesis. Use a 2.4 scope or a 2.9 scope.
   c. **Portals**
      i. Anterior lateral
      ii. Direct lateral
      iii. Posterior lateral
      iv. Posterior – medial to the Achilles tendon (for the prone position)
   d. **Technique - lateral**
      i. Patient placed with the affected hip elevated and internally rotated
      ii. No traction required
      iii. Make the portals with care not to damage the superficial nerves
      iv. An incision of the capsule may be required
      v. The C arm and palpation will be required to identify the joint line
      vi. The instruments may be placed in bone if care is not taken
      vii. Fusion may require dissection of the joint capsule to allow insertion of the instruments.
      viii. Fixation is via screws from the tuberosity of the calcaneus to the talus.

2. **Talo-navicular joint.**
   a. **Anatomy**
      i. A ball and socket joint
      ii. The talonavicular joint has a thick strong plantar and medial capsule supporting the medial arch of the foot
      iii. The dorsalis pedis artery and the deep branch of the peroneal nerve are in close approximation to the dorsal aspect of the joint
      iv. The calcaneo cuboid joint is co linear with the lateral joint line and moves in conjunction to the talo navicular joint
      v. The talo navicular joint is a key joint in motion of the hindfoot second only to the ankle joint
      vi. The talo navicular joint if fused will prevent almost all motion at the calcaneo cuboid and subtalar joints
   b. **Indications**
      i. Osteochondral injury
      ii. Fusion
      iii. fracture
c. Portals
   i. Dorsal medial
   ii. Dorsal lateral
   iii. Medial
   iv. Trans calcaneo cuboid joint to the lateral side

d. Technique
   i. No distraction required
   ii. Find the joint using palpation and mini c arm: It is easy to end up inserting
      the instruments into bone in the navicular or talus
   iii. Release of some of the capsule may be required in fusion cases to assist in
      visualization of the joint
   iv. The trans calcaneo cuboid joint portal is particularly useful as it allows the
      joint to be visualized from the lateral side
   v. Fixation for fusion is achieved via a separate stab wound on the plantar
      medial aspect of the foot over the navicular tuberosity: 2 small or 2 large
      fragment screws (dependent on patient size) are placed from here into the
      talus

e. Outcomes
   i. Isolated open talo navicular fusions do not necessarily have a high fusion
      rate. However a higher fusion rate will occur if all three of the triple joint
      complex are fused at the same time.
   ii. No papers have been written on debridement of OCD lesions of the
      talonavicular joint.
   iii. Two papers have described the techniques of TN arthroscopy [7] and
      fusion [8].

   i. Sural nerve lies lateral to the joint and superficial branch of the peroneal
      nerve branches lie dorsal
   ii. The joint has a tight lateral and plantar capsule as it is key in supporting the
      arch of the foot
   iii. The joint has a complex s shaped surface allowing some medial to lateral
      translation and dorsi flexion and plantar flexion
   
   b. Indications
   i. Avulsion fragment of anterior calcaneus
   ii. Dorsal debridement
   iii. Chondral injury
   iv. Fracture [9]
   v. fusion

   c. Portals
   i. Dorsal lateral
   ii. Plantar lateral
   iii. Trans talo navicular approach to the dorsal medial joint

   d. Technique
   i. Patient placed with the affected hip elevated and internally rotated
   ii. No traction required
   iii. Make the portals with care not to damage the superficial nerves
   iv. An incision of the capsule may be required
   v. The C arm and palpation will be required to identify the joint line
   vi. The instruments may be placed in bone if care is not taken
   vii. A dorsal debridement can be performed with the scope from the dorsal
      lateral side and the instruments placed from the plantar medial sside
viii. Fusion may require dissection of the joint capsule to allow insertion of the instruments.
ix. Fixation is via cross screws under c arm control.

e. Outcomes
i. Isolated fusion of the calcaneo cuboid joint has a relatively high non union rate.
ii. No outcome papers have been published for arthroscopic procedures of the calcaneo cuboid joint.

4. First MTP joint.
   a. Anatomy [1]
      i. Tendons:
         Tendons: EHL, EHB and extensor hood.
         1. Plantar complex: Sesamoids sit each side of FHL.
         2. Medial sesamoid has insertion of Abductor hallucis muscle and medial head FHB
         3. Lateral sesamoid has adductor hallucis muscle and lateral head FHB.
         4. Tendons from sesamoids insert into proximal phalynx
         5. FHL inserts into base of distal phalynx

      ii. Nerves:
         1. Medial plantar hallucal nerve – sits just medial to medial sesamoid. Avoid injury!
         2. Common plantar digital nerve divides into lateral plantar hallucal nerve: Sits plantar and lateral to lateral sesamoid
         3. Dorsal medial hallucal nerve: Branch of superficial peroneal nerve. Runs medial to the EHL tendon

      iii. Joint
         1. Intra articular structures. Crista of metatarsal head separates the medial and lateral sesamoid articulation
         2. Capsule is quite loose and allows relatively easy instrumentation of the joint but has recesses that are hard to reach for synovectomy.
         3. Metatarsal head: large articular surface with dorsal, medial, lateral and plantar surfaces.
         4. Plantar surface of met head is divided by the crista into a medial and lateral articulation for the sesamoids.

   b. Indications
      i. Osteochondral injury
      ii. Fusion [2]
      iii. Synovitis
      iv. Bony impingement
      v. Loose body
      vi. Fractured sesamoid or turf toe [3] [4].

   c. Contraindications
      i. Extensive arthritis if joint preservation is to be performed.

   d. Portals
      i. Dorso medial. Approach should follow same principles as all foot and ankle arthroscopy: Skin incisions should be superficial and deep dissection should be blunt.
      ii. Dorso lateral
      iii. Medial
      iv. ? accessory – plantar lateral through first web space.
e. **Technique**
   i. **Distraction:** May be performed using finger traps.
   ii. Sometimes easier to flex and extend the toe to visualize the joint and use the instruments and scope to distract the joint after the assistant distracts the joint.
   iii. **Positioning:** Use a bump or bean bag to ensure that the toe is pointing towards the ceiling.
   iv. **Instrumentation:**
      1. 1.9 scope
      2. Small shaver
      3. Small joint instruments
   v. Curettes and osteotomes are useful for removal of osteophytes or debridement of osteochondral defects.
   vi. After insertion of the instruments and scope the joint should be inspected. Try to visualize:
      1. Dorsal recess
      2. Medial gutter
      3. Lateral gutter
      4. All surfaces of the metatarsal head
      5. All surfaces of the proximal phalanx
      6. The sesamoid articulations (hard to see)

f. **Outcomes**
   i. 2006: 19 of 20 pain free after arthroscopy for various causes. [5]
   ii. Ferkel: 22 cases. 73% good, 13.5% fair, and 13.5% poor. [6]

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**References great toe**

**References triple joint**