Should all athletes that have an acute ankle injury have an arthroscopy

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- The role of ankle arthroscopy in the management of chronic ankle disease is firmly established.
- The role in acute setting is less well defined
  - Evidence for usage in a wide variety of situations, generally restricted to level 4
  - The potential benefits of arthroscopic surgery are clear in the athlete and include accelerated rehabilitation and return to sport. Acute arthroscopic assessment or treatment of acute injuries may therefore have a key role in the setting of acute ankle injury of the athlete.
  - Hepple and Guha (2013) suggested the following:

<table>
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<th>Indications for acute ankle arthroscopy</th>
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<td><strong>Indications for arthroscopic-assisted surgery in acute ankle injuries</strong></td>
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Acute ligament injury:

- Surgical intervention in acute ligament injuries controversial.
  - Individual randomized studies suggest lower rates of pain and recurrent instability in the surgical group (Pijnenberg 2003)
  - The Cochrane database review (Kerkhoffs 2007)
    - No benefit of acute surgical versus conservative treatment
- Well established that low-to-moderate-demand individuals suffering an isolated lateral ligament injury should be treated conservatively with the expectation of a full recovery to normal sporting function following functional rehabilitation. Failing this, late anatomic repair/reconstruction of the lateral ligaments has produced well documented reliable results (Baumhauer 2002)
- Acute surgical repair of the lateral ligaments only considered in high-demand patient or athlete to enhance/accelerate the return to normal activity.
  - Simultaneous arthroscopic assessment of the joint may be appropriate.
    - Well documented that intra-articular joint surface damage is common in the sprained ankle.
      - Up to 93% incidence of intra-articular disease in patients undergoing arthroscopy immediately before lateral ligament repair (Kemonda and Ferkel 1999)
        - Most damage confined to the chondral surface and does not involve underlying bone => MRI does not always show the lesion
        - As little as 40% sensitivity of MRI to coexistent intra-artic. lesions (Joshy 2010; O’Neill 2010)
        - Most studies relate to the chronic situation
      - Reasonable to assume that a percentage of acutely diagnosed lateral ligament injuries have intra-articular disease either not visible on MRI or obscured by acute edema/hemorrhage.
        - Good long-term results with simultaneously treated osteochondral lesions of talus (OLT) and lateral ligament repair (Gregush and Ferkel 2010)

  ⇒ Acute arthroscopy has potential benefits in detecting lesions that require treatment (e.g. OLT) and may prevent or hamper recovery after ligament repair.

- There is no evidence to guide surgeons in the acute phase as to which lesions cause late ongoing symptoms
  ⇒ Some such lesions overtreated and more work required to clarify
- Recently new techniques described to achieve lateral ligament stabilization by entirely arthroscopic means. These techniques remain experimental and have been reported only in cases of chronic instability.
  - ? May be expanded to acute management and potentially extend indications for acute arthroscopic treatment as rehabilitation is accelerated (Liu 2003, Corte-real 2009, Wang 2014)
Chondral/Osteochondral lesions:

- Injuries to the articular surface of the ankle are common after ankle trauma
- Up to 60% of ankle fractures undergoing surgical fixation demonstrated evidence of articular surface damage (Lauren and Ferkel 2009)
  - Most undiagnosed before surgery because of low sensitivity of X-ray
  - The natural history of purely chondral surface damage not established.
    - The findings of Ferkel suggest that many lesions settle without long-term symptoms
    - The active treatment of some acute lesions is open to question
- True osteochondral lesions are less common but are often most amenable to early arthroscopic treatment
  - An appropriate search for these lesions should be made
  - Direct arthroscopic visualization allows the optimal assessment of the level of displacement, site, size, and condition of the fragment.
    - Determine whether fragment fixation or removal is performed
    - When appropriate, lesions may be reimplanted either entirely arthroscopically or through a small arthrotomy with arthroscopic assistance.
      - Fixation is best performed in the acute setting before bony swelling and deformity caused by weight bearing alter the anatomic fit of the fragment.
    - If nonsalvageable, loose fragments may be excised and the surrounding edges stabilized via arthroscopic means.
      - Subsequently, the bed of the donor site should be treated by marrow stimulation technique (Choi 2009, Zegerink 2010, Cuttica 2011)
    - If lesions large (>150mm²) and fixation of fragment not possible, marrow stimulation techniques have a poorer outcome (Choi 2009). Early second-line intervention is considered and in the case of cartilage growth techniques, a suitable biopsy from the edge of the lesion can be taken and stored
Syndesmotic injury

- Some degree of syndesmotic ligament injury is reported to occur in 47% to 66% of Weber B and C ankle fractures (Lauren 2002; Lui 2005)
  o Diagnosis is often difficult as no radiographic technique entirely reliable and radiographic indices vary between investigators
  o False negative rates up to 58% (Takao 2003)
- Syndesmotic instability can occur without bony trauma (high ankle sprain)
- Evidence that arthroscopic assessment of the syndesmosis more accurate than static or stress radiographs (Lui 2005, Takao 2001, Sr-Ram 2005)
  o At arthroscopy, easy passage of the arthroscope into the lateral gutter is suspicious
  o Further confirmation is obtained by unhindered passage of instruments into the tibiofibular recess
  o Torn anterior and posterior inferior tibiofibular ligaments can be directly visualized
  o External stress placed on the fibula allows observation of the stability in various planes.
  o Increased diagnosis of instability as direct visualization allows detection of instability in multiple planes.
    ▪ Plain X-ray and radiographic indices only assesses in coronal plane.
    ▪ Instability in the sagittal, longitudinal, or rotational planes, more easily visualized at arthroscopy.
  o Useful to check reduction and stability post fixation
- Untreated, syndesmotic instability can result in persistent long-term symptoms in the ankle
  o Complete disruption of the syndesmosis produces 40% reduction in contact surface area (Burns 1993)
    ⇒ Improved diagnostic accuracy potentially of great benefit.
- Although the evidence points to an underdiagnosis of syndesmotic instability with traditional methods, it is not clear how the syndesmosis should be managed after arthroscopically assisted diagnosis.
  o The use of this technique may lead to overtreatment and further work is required to establish at what level of arthroscopically diagnosed instability intervention is required
  o In the athlete, current opinion indicates an aggressive debridement +/-stabilization approach
    ▪ Good results in 19 patients after simple debridement of the unstable syndesmosis after ankle fracture (Ogilvie-Harris 1994)
Ankle fracture:

- Up to 75% incidence of coexistent intra-articular damage apart from the fracture site in ankle fractures (Ono 2004, Takao 2004)
  o Most undiagnosed before surgery because of the low sensitivity of plain X-ray
  o Lesions often occur at sites not accessible by traditional incisions for fracture surgery

- Ankle arthroscopy can be useful, particularly in cases that are fixed via small incisions. The arthroscope can assist with clearance of the fracture site and ascertain accuracy of reduction as well as ensuring that there is no internal abnormality around the fracture site at the completion of the procedure.
  o Technique issues
    ▪ Articular distraction (skeletal or soft tissue traction) is recommended
    ▪ Gravity-fed fluid inflow is preferred to pump devices to avoid secondary calf compartment syndrome.
    ▪ The arthroscopic element is used to
      • Identify the fracture pattern and clear comminution or depressed fragments
      • K-wires may be percutaneously inserted into the fracture fragments to manipulate them into position and aid reduction before definitive fixation is usually achieved via cannulated lag screw techniques.
  o Particular examples include
    ▪ Triplane and Tillaux fractures
    ▪ Simple posterior malleolar fracture - direct visualization of the fracture line and reduction may otherwise involve large exposures
    ▪ Talar Body fractures
      • The result is determined by the quality of the reduction and preservation of the talus blood supply
        o Arthroscopically assisted techniques may confer benefit in both aspects
        o Saltzman 1994 described their technique but admit that it is limited to the simpler 2-part fracture patterns
  o Prospective randomized trial comparing arthroscopically assisted with traditional nonassisted lateral malleolar fracture fixation (Takao 2004)
    ▪ High rate of secondary disease (mostly chondral and syndesmotic)
    ▪ A small but significantly greater AOFAS score in the arthroscopically assisted group at average follow-up of 40 months
      • Benefit was confined to those fractures classified as pronation-abduction types (Lauge-Hansen)
Peroneal tendon injuries:

- In the athlete presenting with acute ankle injury, the diagnosis of peroneal tendon injury needs to be considered to avoid late presentation.
- Commonly misdiagnosed as ankle sprains and are often associated with lateral ankle instability or intra-articular disease.
  - Bare and Ferkel 2009
    - Predisposing factors to tendon injury
      - Intrinsic factors
        - Flat fibular groove and laxity of superior peroneal retinaculum
        - Low-lying muscle belly
        - Osteophytic spurring
        - Cavus foot
      - Extrinsic factors
        - The sporting activity
        - Foot position on impact.
    - Reported 60 intraarticular lesions in 30 ankles undergoing tendon repair
      - The ankle disease included soft tissue impingement, loose bodies, osteochondral lesions, extensive scar tissue, extensive synovitis, and anterior osteophytes.
      - Most (78%) lesions undetected on preoperative scans.

Proposed that ankle arthroscopy should be routinely performed while undertaking peroneal tendon repair. This strategy enables early detection and treatment of intra-articular lesions invisible to imaging techniques.
CONCLUSION

Ankle arthroscopy is a worthwhile procedure for athletes that sustain an acute and significant ankle injury.

It has potential diagnostic and therapeutic benefits particularly in the settings of:

- Ligamentous injuries that warrant stabilization
- Malleolar, distal tibial and talar body fractures
- Suspected unstable syndesmotic injuries
- Osteochondral injuries
- Peroneal tendon damage

The athlete that is “slow to recover” without an obvious cause