1. What is the ankle syndesmosis and why is it so challenging:
   a. The distal fibula should dock into the fibular notch of the tibia
   b. Ligaments providing stability
      i. Anterior tibiofibular
      ii. Posterior tibiofibular
      iii. Interosseous membrane

2. Fracture patterns with anticipated syndesmotic involvement:
   a. Never in low fibula fractures (below ligamentous complex) Weber A
   b. Usually not in Weber B injuries (just above ligamentous complex)
   c. Weber C, when fibular fracture is higher

3. Assessing syndesmotic involvement:
   a. Radiographic evidence
      i. Plain radiographs
      ii. CT scan
   b. Intraoperative assessment of ligament damage, instability

4. Intraoperative assessment of syndesmotic reduction and pitfalls to anatomic reduction:
   a. Assessing the fibular reduction to fibula with compression clamp
   b. Assessing the “docking of the fibula” clinically and radiographically
   c. Importance of the lateral x-ray
   d. Evaluation of fibula reduction
      i. Restoration of length
      ii. Correct angulation
   e. Soft tissue interposition

5. Methods of stabilization:
   a. Position screw(s)
   b. Suture button techniques
   c. Stabilization is USELESS if the fibula cannot be easily and anatomically reduced to the tibial incisura

Ankle injuries involving the distal tibio-fibular articulation with or without an associated fracture continue to be a challenge to manage for the most experienced orthopaedic surgeon.
Involvement of the distal tibio-fibular syndesmosis includes approximately 5-10% of ankle sprains and 13-23% of ankle fractures.

Determining which injuries require operative repair continue to be a challenge. Aspects of management that create additional challenges include: pre-operative assessment, intra-operative reduction and modes of fixation and intra-operative evaluation of reduction. Keys to optimal outcome are dependent upon the accurate assessment of the spectrum of injury, operative reduction, maintenance of reduction and restoration of anatomic alignment of the ankle mortise.

Anatomic reduction is tantamount to optimize outcome. However methods of reduction, implants for fixation and subsequent need for removal are areas of ongoing controversy. Additionally, accurate determination of reduction presents a challenge, even in experienced hands.

Operative repair of syndesmotic injuries associated fractures requires fibular anatomic reduction and open reduction of the fibula within the tibial incisura. Methods of fixation have traditionally employed screw fixation. Options for this mode include one or two screws engaging three or four cortices. Emerging data on the utility of suture button devices may obviate the some of the sequelae associated with the use of hardware in treating these injuries.

Finally, the assessment of the intraoperative reduction poses additional challenges. Use of standard fluoroscopy, contralateral extremity comparison, 3-D fluoroscopy and CT scan have been suggested to assess and ensure anatomic reduction.

Post-operative management and outcomes require an accurate assessment of the extent of the injury and surgical repair.

REFERENCES: