



## Conservative Treatment in Acute Multiligament Injuries

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## Multiligament-injured knee

- Complex problem in orthopaedic surgery
- Typically arising from an acute knee dislocation
- High energy trauma !!!
- At least 3 of the 4 major ligaments torn
- Often concomittant lesions: fracture, vascular and nerve damage




## Available evidence...

- Knee dislocations account for less than 0.02% of all orthopaedic injuries
- Low prevalence makes it difficult to large, prospective clinical trials for multiligament knee injuries

## Available evidence...

- Therefore little high-level evidence on which to base treatment decisions
- Controversy regarding optimal management for these uncommon but debilitating conditions

### Management of knee (tibiofemoral) dislocation



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    graph TD
      A["Tibiofemoral dislocation  
OR  
Knee with multiple ligamentous injuries"] --> B["Reduce joint immediately  
- Posterolateral dislocations not reducible  
- Procedural sedation as indicated"]
      B --> C["Examine distal and popliteal pulses  
- Obtain ankle-brachial index  
- Perform bedside duplex ultrasound screen if available"]
      C --> D["Strong distal pulses  
- Ankle-brachial index >0.9  
- Normal duplex ultrasound"]
      C --> E["Well perfused limb, BUT:  
- Asymmetric pulses  
- Ankle-brachial index <0.9  
- Abnormal duplex ultrasound"]
      C --> F["Weak or absent pulses  
- Signs of ischemic limb or vascular injury"]
      D --> G["Admit for observation  
- Perform serial vascular examinations  
- Obtain orthopedic consultation for reconstructive surgery"]
      E --> H["Obtain urgent arteriogram or comparable vascular study (eg. CT angiogram) in consultation with vascular surgery"]
      F --> I["Emergency vascular surgery consultation  
- Operative repair"]
    
```

## What about diagnosis...

- Acute : Difficult  
We wait...

BUT....

- Chronic : ...why did we wait ?!?

## Current treatment options

- Surgical *versus* Nonsurgical Management
- Preoperative external fixation *versus* Hinged knee bracing
- Open *versus* Arthroscopic Reconstruction
- Early *versus* Late ligament reconstruction
- Ligament Repair *versus* reconstruction
- Postoperative external fixation *versus* Hinged knee bracing



## Surgical *versus* Nonsurgical Management

Meta-analysis (2001) Dedmond et al.:

- Improved motion with surgical reconstruction
- No differences in stability and return to work
- Average Lysholm scores were almost 20 points higher in the surgically treated group

Overall: Too little evidence available to draw any conclusions



## External fixation *versus* Hinged knee bracing

- There is a role for external fixation
- The main advantage of external fixation is the ability to assess the skin, compartments, and neurovascular status of the affected limb with serial examinations



## Open *versus* Arthroscopic Reconstruction

- The selection of arthroscopic versus open reconstruction in a complex knee injury depends on the timing of the surgery as well as the nature of the injury itself
- The preferred treatment consists of arthroscopic ACL and PCL reconstruction, with open reconstruction being reserved for the LCL/posterolateral corner (PLC) and/or the MCL/posteromedial corner



## Early *versus* Late ligament reconstruction

- Ligamentous reconstruction in patients with severe soft-tissue trauma or the management of concomitant nonorthopaedic injuries are often deferred for weeks before definitive surgical treatment, resulting in worse outcomes for patients treated in the chronic rather than the acute period
- Prospective trials with closely matched participants are necessary



## Ligament Repair *versus* reconstruction

- Reconstruction has lower failure rates and results in more stability
- Allograft tissues provide several benefits over autograft tissues, including absence of donor site morbidity, multiple graft size options, and less tourniquet time
- PCL: achilles tendon



### Summary (I)

1. Vascular assessment should include serial physical examination and Ankle-Brachial Index measurement, with the selective use of arteriography.
2. Early surgical management should be done of all damaged ligamentous structures.



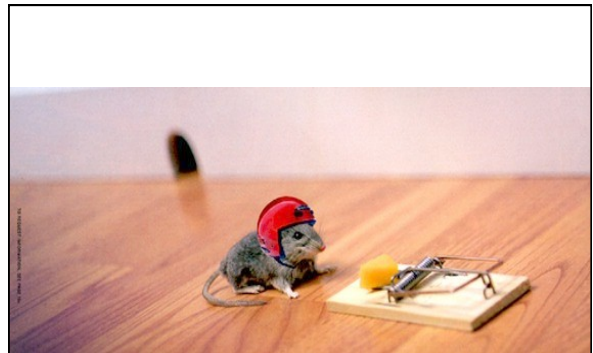
### Summary (II)

3. Selective use of preoperative and postoperative joint-spanning external fixation is advocated
4. Arthroscopic reconstruction of the ACL and PCL should be done, rather than repair of these structures
5. Primary open reconstruction rather than repair of the LCL/PLC should be done, either staged or with concomitant ACL/PCL reconstructions.



### Summary (III)

6. Primary open repair or reconstruction of the MCL/PMC should be done, either staged or with concomitant ACL/PCL reconstructions.
7. Allograft or autograft tissue should be used for all ligamentous reconstructions. Donor site morbidity should be considered when choosing autograft tissue.



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