Imaging of intraarticular proximal fractures

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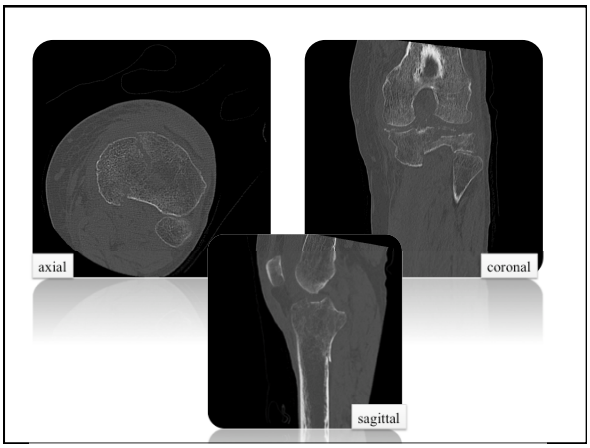
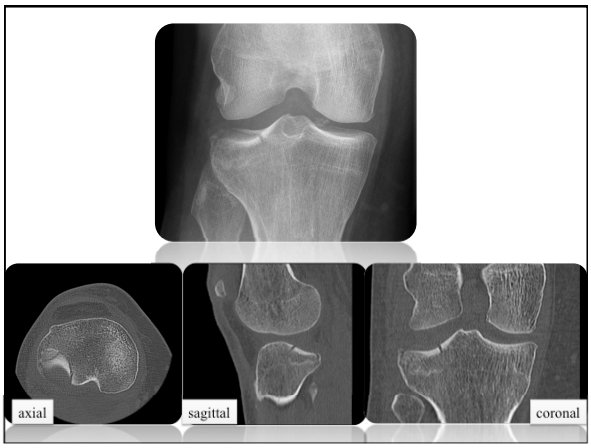
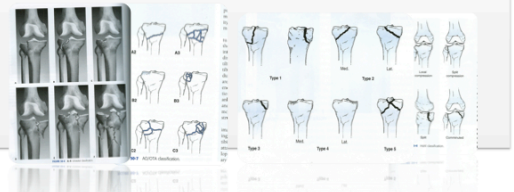




Does CT scanning improve reliability of classification systems?

- Brunner et al Injury 2009
- CT scanning improved inter/intra-observer reliability of AO / Schatzker / Hohl classification ("good reproducibility")

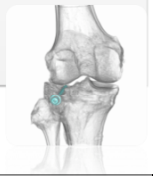


2D / 3D CT

- 3D CT increase reliability of classification systems for tibial plateau fractures
- 3D CT is a more reliable radiographic modality than 2D CT in evaluaton of fracture patterns.
  (Hu et al , Injury 2009)

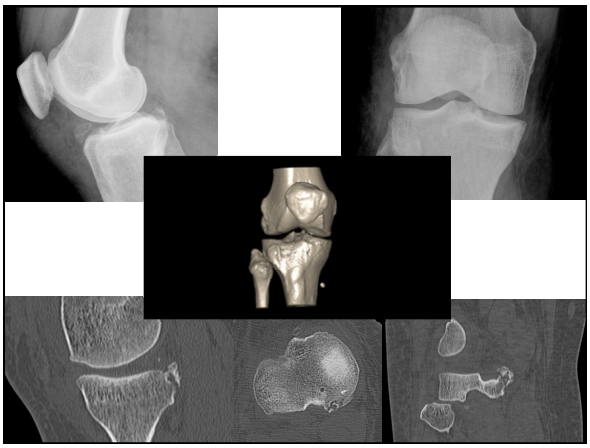
- Comparison of plain radiography and spiral CT with 3D reconstruction
- 3D reconstructions give a better and more accurate demonstration of the tibial plateau fracture and allows a more precise pre-operative surgical plan

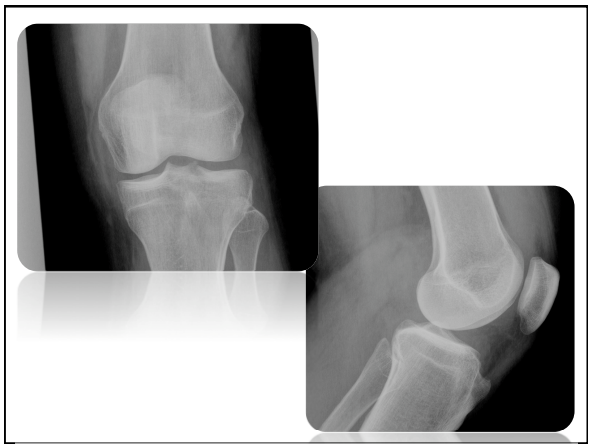
(Wicky et al Eur Radiol. 2000)

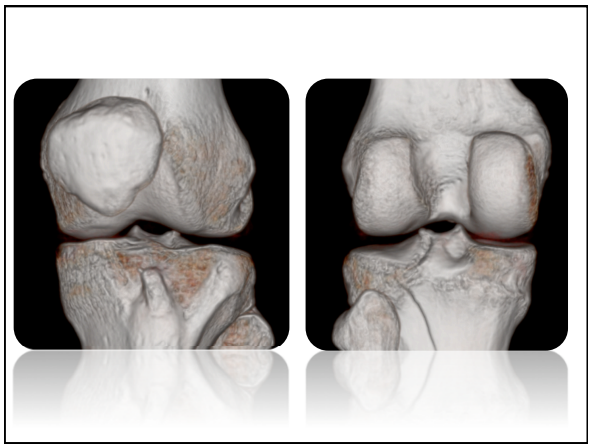


- Use of virtual 3D software for planning of tibial plateau fracture reconstruction
- Special planning software to perform preplanning with successful segmentation analysis, although still time consuming (mean time 174.8 min, 5 cases)

(Suero et al Injury 2009)

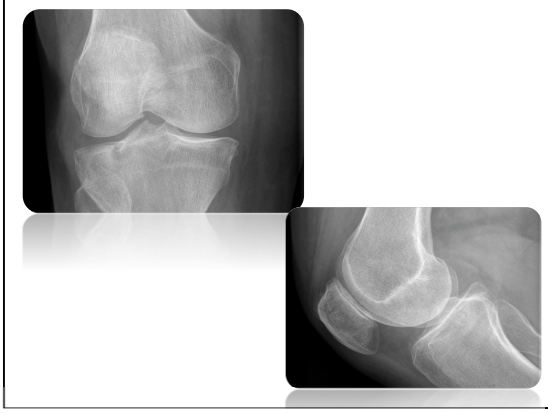






Literature

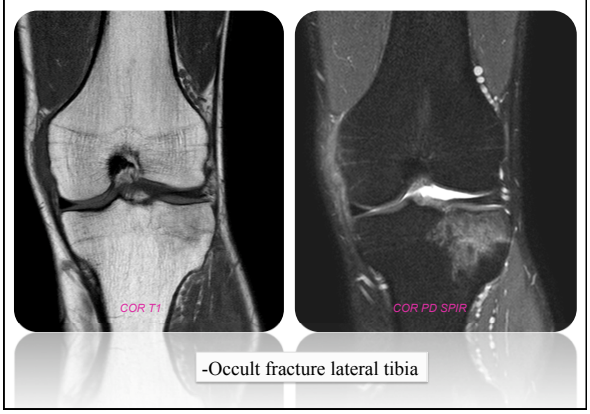
- Markhardt et al Radiographics 2009
- Both CT and MRI imaging are more accurate than plain radiography for classification (Schatzer) of tibial plateau fractures
- Use of cross-sectional imaging can improve surgical planning

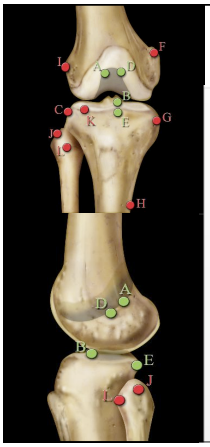


MRI

MRI indications

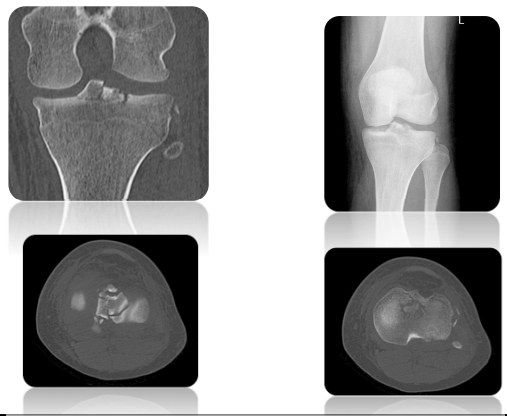
- Recent study showed 90% of tibial fractures had evidence of meniscal injury on MRI, so either MRI / arthroscopy / open exploration should be considered
  (Gardner J Orthop Trauma 2005)
- "nonunion did occur due to incarceration of meniscus tissue in the fracture site".
  (Toro-Arbelaez, Injury 2007)

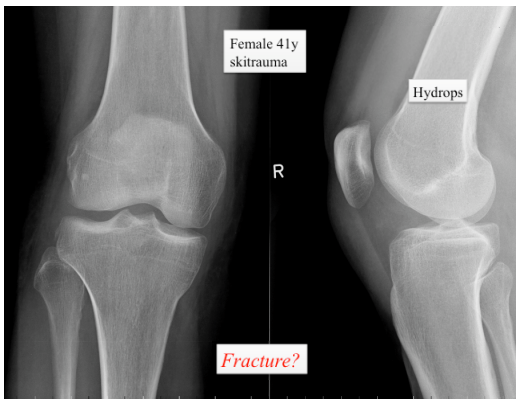


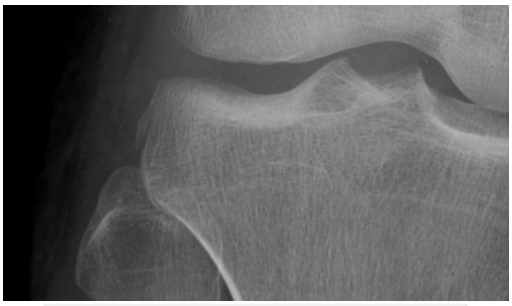


Avulsion fractures

- ACL, PCL (green) origin, insertion (eminentia)
- MCL (origin, meniscofemoral and distal insertion)
- Capsular insertion (ligament fibers) Segond fracture (almost always with ACL rupture)
- ITB: Gerdy tubercle
- Fibular head: Arcuate ligament ("arcuate sign"), LCL, biceps tendon



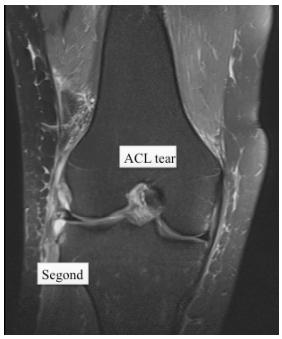


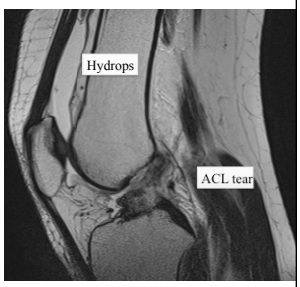


Segond fracture (capsular insertion, also ligament fibers)
Almost always ACL # and / or meniscal #

Segond P. *Recherches cliniques et expérimentales sur les épanchements sanguins du genou par entorse. Progres Med 1879; 7:297-299, 319–321, 340–341.*

MRI





Conclusion

Plain radiographs

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CT scan, preferebly with 3D reconstruction

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Possible MRI indications (avulsion # ?, occult fractures, ruling out meniscal / ligament pathology if no inspection during surgery)


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THANK YOU !