

# High detection rate of ALL / Segond lesions by using Dynamic Ultrasound in patients with acute ACL injuries

Suzanne Witjes, Stephan Konijnenberg, Marlon Scholtes, Burt Klos

## Misunderstandings

- Segond fracture is rare?
- Segond fracture is hard to find?
- Segond avulsion is only a minor small fragment (to be detected on X ray)?
- Segond avulsion fragment is only attached to the small anterolateral ligament (ALL)?
- Segond fracture itself needs no treatment???
- Segond fracture cannot be repaired (with a implant)???



## Objectives

- Recently increased interest in lesions of the anterolateral structures of the knee resulted in a better understanding of its role in rotational instability, in association with anterior cruciate ligament (ACL) injury



- So far, imaging studies have been mainly performed by using X ray or MRI

## Objectives (2)

- The detection rate of bony avulsions with ACL rupture, in relation to the anterolateral ligament (ALL) (i.e. Segond lesion) was previously described in 9% on plain radiograph and in 3 - 6 % on MRI
- Hypothesis: Dynamic Ultrasound Imaging might detect more ALL avulsion lesions, due to less distortion by hematoma and by the dynamic aspect of moving the probe around the anterolateral tibia with more 3D orientation



## Methods

- Dynamic Ultrasound Imaging was performed in 88 acute ACL patients, < 4 weeks following injury
- We looked for the diagnosis of concomitant lateral femoral condyle impression (> 2 mm), Segond avulsion, medial collateral ligament injury and meniscal injury
- Imaging was performed in both supine and prone positions. Segond lesions, as being a bony avulsion of the ALL, can be detected by ultrasound imaging of the anterolateral part of the tibia

## Results

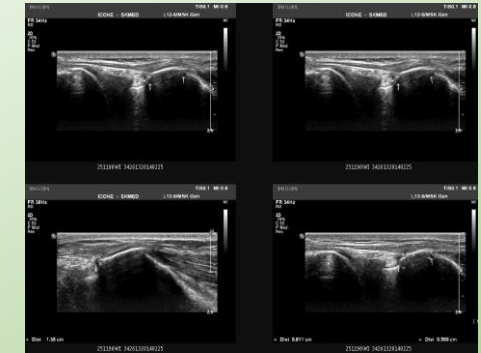
- 88 patients with ACL injuries: 40 % soccer, 28 % skiing
- The detection rate of found Segond Lesions was 29 % (N=25)
- There was a 100 % correlation of Segond lesions with impression of the lateral femoral condyle



- The number of detected meniscal injuries in the patients with Segond lesions was substantial; 86 % lesions in the medial meniscus, 29 % lesions in the lateral meniscus

Contact information  
ICONE orthopedics & sports traumatology  
P.O. Box 41  
5480 AA Schijndel  
The Netherlands  
switjes@icone.nl / www.icone.nl

## US patho anatomy ALL complex



## Conclusions

- Segond fracture is not that rare!
- Segond fracture can be detected by Dynamic Ultrasound
  - in 29 % (25/88) of patients with acute ACL tears
- Segond avulsion is attached to the ITB / ALL complex
- Role of surgical treatment of Segond fracture?
  - In case of substantial rotational instability (i.e. Pivot 3+): refixating or reconstructing the ruptured ALL structures / Segond fracture should be taken into consideration in, as a possible concomitant procedure to ACL reconstruction

## Refixation of Segond fracture

- 1- Preoperative marking with Ultrasound Imaging
- 2- Peroperative staple fixation
- 3- Postoperative Xray (+ ACL with BPTB)

