

## Evaluating The Utility Of Accessory Lateral Tibial Plateau Radiographs In Posterolateral Tibial Plateau Fracture Reduction: An Anatomic And Radiographic Study

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### INTRODUCTION:

Posterolateral tibial plateau articular fragments are difficult to accurately visualize, reduce and stabilise. We hypothesized that we could define a fluoroscopic view that would reliably and reproducibly image the posterolateral tibial plateau. We also hypothesized that this accessory fluoroscopic view would improve our accuracy in assessing posterolateral fragment articular steps or malreductions.

### METHODS:

The true articular tangent of the posterolateral tibial plateau in 7 cadaver knees was determined fluoroscopically, using stainless steel markers. The most accurate "accessory view" was oblique, elevated 30 degrees from the horizontal with the knee in extension – profiling the proximal tib-fib joint. The posterolateral plateau was osteotomized, and secured with k-wires. Images included; AP, lateral, joint line and accessory views. Sequential malreductions of 2mm then

5mm depression were incorporated and imaged. The 84 images were randomized and reviewed by 4 fellowship trained trauma surgeons. Accuracy was assessed, an inter-rater reliability analysis using the Fleiss' Kappa statistic was performed to determine consistency among observers and intra-rater reliability was assessed using the Intra-rater correlation coefficient.

### RESULTS:

Fellowship trained observers correctly identified articular congruity or incongruity 79% of the time with

AP/Lateral image combined, 79% of the time with only the accessory view and 63% with only the joint

line view. When stratified for reduction, the observers were accurate 84% of the time with an anatomic plateau, 55% with 2mm depression and 88% with a 5mm depression. The accessory view was most accurate (73% correct) for recognizing a 2mm step. The overall inter-rater reliability for the observers was  $K = 0.47$  ( $p < 0.001$ ), 95% CI (0.39, 0.56), indicating moderate agreement. Intra-rater reliability was moderate-strong (ICC range 0.58-0.76).

### DISCUSSION:

It is possible to reliably image the posterolateral tibial plateau with an accessory "tib-fib" fluoroscopic view. This view is easily reproducible as it profiles the proximal tib-fib joint, providing a reliable anatomic landmark. Overall, 5mm posterolateral fragment malreductions were most reliably identified. The "tib-fib" accessory view was the most reliable single view for identifying 2mm malreductions.

### CONCLUSION:

We propose the addition of an accessory fluoroscopic "tib-fib" view when dealing with a posterolateral column fracture of the tibial plateau as an adjunct to direct articular visualization

### REFERENCES:

1. Graves ML et al. J Orthop Trauma 2011;25:106-109
2. Meulenkamp B et al. Submitted to JOT Feb 2016
3. Yang G, et al. Arch Orthop Trauma Surg. 2013 Jul. 133(7):929-34.