

Tibial lateral condyle fractures – Comparison of conventional plate and angle-stable plate fixation

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Objective

To review functional and radiological results of tibial lateral condyle fractures treated either with conventional plates or angle-stable plates during the years 2002–2008.

Design

Retrospective study.

Patients and methods

We analyzed the results of 67 patients with 67 displaced tibial AO/OTA type B3.1 lateral condyle fractures, who were treated with open reduction and internal plate fixation. All patients, excluding 4, had preoperative computed tomography scans (CT) for accurate fracture evaluation. 28 patients were operated on with a conventional L-shaped buttress plate and 39 with the Less Invasive Stabilisation System plate (LISS) or L-shaped Locking Compression Plate (LCP).

The mean age of the patients at the time of injury was 49 (17–77) years. 18 (27%) of the patients were 60 years or older. The most common mechanisms of injury were falling on flat ground (67%), sports injury (16%), car bumper hit (15%) and fall from heights > 1 meter (10%).

The mean follow-up time was 55 months (range 19–102 months). All 67 patients had a clinical examination with particular attention to their gait and knee motion and stability. Conventional standing knee x-rays were taken to evaluate the stage of developed posttraumatic osteoarthritis. In addition the mechanical axis of both injured and non-injured lower extremities were determined.

At the final follow-up visit Lysholm knee score and

a disability scale relating to knee osteoarthritis (Western Ontario and McMaster Universities Osteoarthritis index, WOMAC) were completed.

Results

In the conventional buttress plate group, the mean mechanical axis at the end of follow-up was 1,3 degrees towards valgus and in comparison to the unaffected knee the change was 2,6 degrees towards valgus. In the LCP/LISS group the mean mechanical axis was 2,3 degrees towards valgus and in comparison to the unaffected contralateral knee the change was 3,5 degrees towards valgus.

In the conventional buttress plate group, the mean WOMAC pain scoring was 11, stiffness 15, and physical function 12. The mean Lysholm scoring was 80. In the LCP/LISS group, the mean WOMAC pain scoring was 7, stiffness 12, and physical function 8. The mean Lysholm scoring was 83.

36 out of 67 patients had mechanical axis 0–5 degrees valgus (mean 2,4 degrees) and the mean WOMAC pain scoring in this group was 9, stiffness 12, and physical function 9. Lysholm scoring in this group was 81. Eleven out of 67 patients had mechanical axis valgus malalignment more than 5 degrees (mean 7,7) and the mean WOMAC pain scoring in this group was 11, stiffness 17 and physical function 15. Lysholm scoring was 80. Twenty out of 67 patients had mechanical axis varus malalignment (mean 2,2 degrees) and their mean WOMAC pain scoring was 9, stiffness 13 and physical function 7. Lysholm scoring was 83.

Conclusion

The radiological results and functional outcome did not differ between the two study groups. In both groups the mechanical axis was slightly more in valgus

than on the contralateral unaffected side, but the differences were not statistically significant.

The goals of treatment of AO B3.1 type tibial lateral condyle fractures are anatomical reduction of the articular surface, filling of the metaphyseal bone defect with bone graft or bone substitute, restoration of limb alignment, stable plate fixation and close to-normal function with minimal morbidity in a reasonable period of time. The type of condylar plate seems to play a minor role in the treatment protocol.