

Rotational Deformity Correction using new Rotation Hinges

Mohi El-Shazy & Angus Strover

1. Literature on tibial rotational corrections for patellofemoral problems: "The miserably malaligned knee [1]"

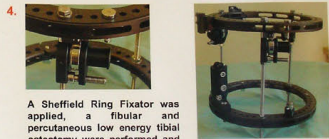
- * A number of studies have linked severe torsional malalignment of the lower limb with anterior knee pain [2,3].
- * The literature has a small number of studies describing technique and results of upper tibial rotational osteotomy but largely in children using internal fixation techniques [1,4,5].
- * There have been no descriptions of progressive correction for this indication in adults. Rotational corrections for other indications have been well described using Ilizarov techniques [6].
- * This case study describes the use of new rotation-translation hinges for correction of severe external tibial torsion causing anterior knee pain.



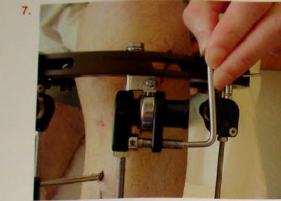
A 36 year old patient presented with bilateral anterior knee pain. He had had multiple operations to improve patellar tracking on the right side with no success and ended up with a patellectomy and a custom made trochlear resurfacing prosthesis. He now wanted the left knee dealt with. On examination he was found to have severely squinting patellae. Examination of his left hip for range of motion showed 55 degrees of internal rotation and 5 degrees of external rotation indicating severe anteversion of the femoral neck. He had 45 degrees of external tibial torsion deformity to compensate for this.

3. Hip X-rays

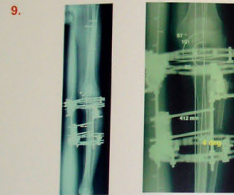
- * OA changes secondary to excessive anteversion.



A Sheffield Ring Fixator was applied, a fibular and percutaneous low energy tibial osteotomy were performed and gradual correction of the external tibial torsion was performed using the new rotation translation hinges.

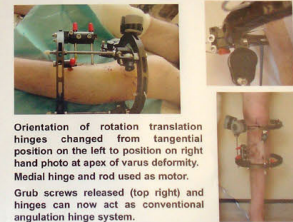


A further 10 degrees corrected gradually by the patient at home using the rotation-translation-angulation hinges.

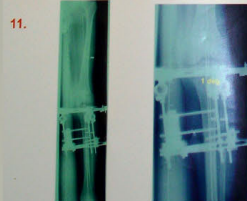


At 2 weeks, 4 degrees of varus identified.

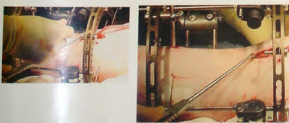
10. Rotation translation hinges used for correction of angular deformity



Orientation of rotation translation hinges changed from tangential position on the left to position on right hand photo at apex of varus deformity. Medial hinge and rod used as motor. Grub screws released (top right) and hinges can now act as conventional angulation hinge system.



Four days later: Angular deformity corrected.



Leg carefully positioned eccentric to the centre of the ring in a postero-lateral direction, deliberately to allow forward translation of the distal fragment creating a Macquet effect, reducing patello-femoral pressures. Fifteen degrees of rotation corrected acutely.



Day 1 postop



Two weeks post op.

13. Follow-up & final X-rays (7 months)



Pre-op Post-op

14. Complication

The patient had transient paralysis of EHL probably due to neuropraxia at the site of the fibular osteotomy

15. Outcome

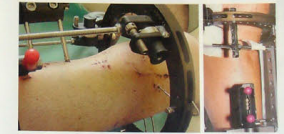
- * Extract from letter from patient dated March 13th 2002 (7 months):

"The good news is that my left anterior knee pain seems definitely improved - not perfect, but unmistakably better. I have recovered about 130 degrees of flexion, and a fair range of movement of my EHL."

I am very pleased indeed. The not so good news is that with a slightly higher activity level, I have been getting some discomfort around my right hip (ie contralateral side to your operation).



17. Rotation Hinges



Comparison with conventional rotation translation systems

18. Discussion & Conclusions

* Severe external tibial torsion associated with anterior knee pain can be corrected gradually by a supra-tuberosity osteotomy. This is safer for the common peroneal nerve and far less invasive.

* The new rotation translation hinges are effective and also allow for angular corrections with no need for major readjustment to the frame.

19. References

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