

Femoral Lengthening Using Limb Reconstruction System (LRS) Over Intramedullary Nail

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BACKGROUND:

Throughout the years, various techniques have been developed to correct lower limb length discrepancies using basic principles of callotasis.¹

CASE PRESENTATION:

A 23 year old gentleman presented with delayed union right supracondylar femur fracture following a trauma 5 months prior, sustaining open comminuted fractures of bilateral distal femur and right patella. Initial surgery was done for both femur. Subsequent follow ups showed union of left femur, but minimal callus formation of right femur despite well healed wounds and absence of infection. Thus, Ilizarov external fixation of right femur was done. Subsequent follow ups until 1.5 years post trauma showed good callus formation however was complicated with right limb length shortening of 6cm. (Figure 1)



Figure 1 – Pre-lengthening lengthening



Figure 2 – Gradual progress

Limb lengthening surgery with insertion of LRS over a retrograde nail without proximal locking screws was done. Gradual lengthening started at 10 days post-surgery. At 6 weeks post-surgery, lengthening up to 5cm achieved and removal of LRS and insertion of proximal locking screw done a month later. At 3 months post lengthening, patient was able to fully weight bear with knee range motion of 0-90.



Figure 3 – Post removal of LRS and proximal locking

DISCUSSION:

Adequate low energy corticotomy technique: prevention of thermal damage, careful bone separation, creation of vascular bone surfaces, respecting the periosteal sleeve and after a latency period of several days gradually pulling the two bony segments apart are the biological cornerstones for good callus formation.¹

One of the most troubling aspect of the process is prolonged immobilization with external fixator apart from cosmetic properties. Paley et al developed a method to reduce the time needed for external fixation using combination of external fixation and intramedullary nail. The study concluded lengthening over intramedullary nail was safe and reliable and gives an advantage over standard lengthening