



INVESTMENTS IN EDUCATION DEVELOPMENT

## **Experience with the Intramedullary Skeletal Kinetic Distractor for Limb Lengthening (ISKD Nail)**

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Surgical limb lengthening has been performed for more than 100 years. Results from surgery prior to the development of the Ilizarov callus distracting technique were poor. The Ilizarov technique was originated in Russia in the 1960s. It achieved limb lengthening by performing an osteotomy of the bone to be lengthened and then once healing callus started to form around the osteotomy site gradually distracting the callus using a ring external fixation device. Since then many different types of external fixation devices or frames have been produced with refinements of hardware but still employing the basic Ilizarov principles of lengthening by callus distraction.

Over the last decade totally implantable limb lengthening devices have been developed and used in clinical practice. These devices utilize a telescopic nail which is inserted into the medullary canal of the bone to be lengthened. The basic Ilizarov principles still apply. An osteotomy is performed and when healing callus starts to form the bone segments are distracted by lengthening the telescopic intramedullary nail.

Since 2009 16 patients have undergone surgical limb lengthening using the ISKD telescopic nail at the Children's Hospital at Westmead in Sydney, Australia. I have performed 14 of these limb lengthenings. 10 patients were male and 6 were female. Their age range at the time of surgery was 14 to 18 years. There were 12 femoral lengthenings and 4 tibial lengthenings. Congenital short femur was the most common cause for a short leg with 10 of the 16 patients having this diagnosis. Other diagnoses included Russell-Silver syndrome, Arthrogyrosis, Perthes disease and trauma. Lengthening was achieved by gradual callus distraction. All patients achieved the planned limb lengthening. There were no cases of premature consolidation. The amount of lengthening achieved ranged from 24-50mm with an average of 38mm. In 3 cases the rate of distraction was uncontrolled "runaway nail" and in 2 of these cases the patients developed nerve palsies. There were no infections. The ISKD intramedullary nail was found to be far more tolerable than an external distraction device for limb lengthening with an acceptable complication rate.