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Limb lengthening and reconstruction using a fully implantable motorised intramedullary nail

Callus distraction can be used to achieve limb lengthening and to bridge skeletal defects by taking advantage of the unique natural potential of bone to regenerate.



500th birthday hospital, Emma is recovering from a cast of her leg after surgery for a bone lengthening procedure.

Offer from Branson

Witt and Jager's motorised intramedullary nail is a fully implantable device that is used for limb lengthening and reconstruction. It is a variation of the callus distraction technique that is used for limb lengthening and reconstruction. The nail is inserted into the bone and is connected to a motor in the proximal part of the nail. The motor is used to lengthen the bone by pulling the nail down the tube. The nail is fully implantable and can be used for limb lengthening and reconstruction.

The history of callus distraction dates to the mid-19th century. Professor Ilizarov of Russia, in the 1950s achieved the breakthrough of transforming a potentially high-risk procedure with severe complications, to a relatively safe one. His work led to establishing the foundations of callus distraction and applying them clinically. The modular ring fixator and operative technique are major landmarks of this success. The Department of Orthopaedic Surgery, TTSH, has the largest experience in this technique in Singapore and the ASEAN region. 500-odd cases of this technique have been

Article in Straits Times, 15 Nov 2000.

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< COVER STORY >

Limb lengthening and reconstruction using a fully implantable motorised intramedullary nail

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used successfully since 1991 to treat adult and paediatric cases of bone loss and limb shortening. The main disadvantages of the external fixator are the risk of infection, nerve and soft tissue irritation and discomfort during the treatment. The Orthofix external fixator used in the patient Emma Richards who was featured in the media recently is a variation of this technique.

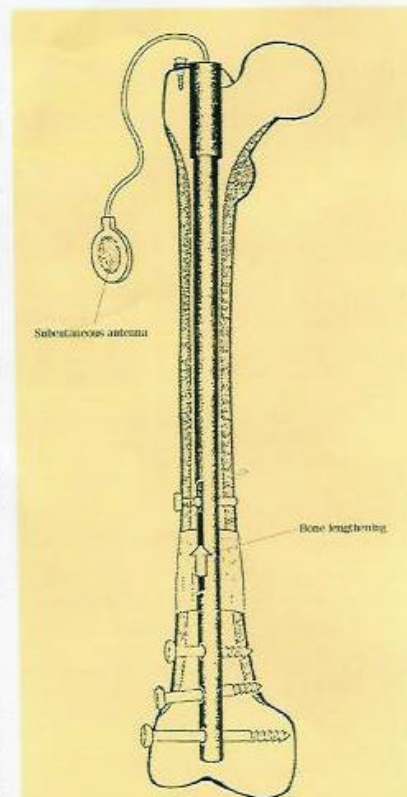
The idea of using an intramedullary distraction device to prevent these disadvantages had been attempted since the 1920s. This was plagued with technical problems, which limited clinical application. Animal experiments confirm bone formation around the nail.

In 1977, Witt and Jager developed the first fully implantable distraction device. Distraction was performed by an electronically controlled distractor set, including a power unit and a two-part guide nail. The operation of the system was regulated transcutaneously by radio control.

The fully implantable motorised nail for limb lengthening and bone transport described combines advantages of using a nail with those of an implantable source of power to good effect. The system has been used to treat various problems including unilateral or bilateral impaired growth, post-traumatic shortening or segmental defects from tumour resection or debridement of osteomyelitic bone. It has also been used for cosmetic lengthening.

The Ilizarov Service in Tan Tock Seng Hospital can now offer this service in Singapore. Clinics are conducted on Friday mornings. Appointments can be made by calling 357 7000 (general appointments) or 357 8000 (for private patients). It requires a short hospitalisation admittance for the insertion of the implant with minimal risk of infection, thus compensating for the higher cost of the implant. Being fully implantable, the system is comfortable to the patient during the entire treatment process. Distraction is simple and can be easily operated by the patient using radio-control.

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Fully implantable lengthening nail for the femur. The subcutaneous reception antenna is connected with a motor in the proximal part of the nail. A guiding tube is fixed in the greater trochanter. During lengthening, the proximal part of the nail slides down the tube. The distal fragment is stabilised with three screws.

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