

Case report-1

The Use of Ilizarov External Fixator in a Difficult Fracture of Tibia

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Abstract:

The Ilizarov External Fixator is the name of a device that is used to treat fracture & stabilize fracture and may also be used to lengthen bone & correct deformity. In 1950, G.A Ilizarov introduced not only a new apparatus but even more importantly a new understanding of the biology of lengthening. This technique enables correction of angular, rotational & translational osseous deformities as well as rotation of limb length equality. The Ilizarov technique is applied to any parts of the body. This technique has a high rate of success in achieving union & eradicating infection, bone loss and mal-alignment. It has produced excellent results where tradition methods have failed to achieve optimum result.

A 50yrs old man was admitted at Dhaka National Medical Institute Hospital with a badly comminuted open fracture at the lower part of Tibia & Fibula. It was very unstable. The patient was treated by using Elizarov External Fixator. Angulation & rotation was corrected repeatedly and ultimately resulted with nice union at the end of 7 month.

Key Notes: Management, Ilizarov Extrenal Fixator, Fracture Tibia, Non union.

Introduction:

The Ilizarov External Fixator is named after the orthopaedic surgeon Gavril Abramovich Illizarov from the Soviet Union, who pioneered the technique. Illizarov method has emerged as a promising "Mid path" regimen in the management of fracture, mal-union, non-union, post polio residual deformity & various congenital deformities, where other methods of treatment failed. Failed treatment is frustrating for both the patient and surgeon in complicated orthopaedic cases. So, the Ilizarov technique can be used to overcome the difficulties & manage successfully.¹

Illizarov technique is a simple, easy, cost effective, minimally invasive & locally made device can serve the purpose.² Illizarov used external fixator device on patient to treat non union in 1950s. Illizarov observed the calus formation & discovered destruction osteogenesis.

Where there is a high risk of infection or the fracture is such severity that internal fixator are un workable.³

Tibia is a long bone, the anterior part of which is placed subcutaneously in the leg throughout most of its length . where it is covered only by skin and a thin layer of

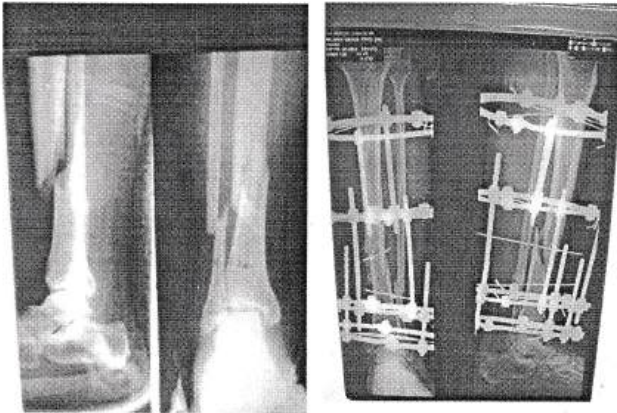
subcutaneous tissue, with no muscle of cuff around.⁴ Limb deformities and infections once considered untreatable or treatable only by amputation , are now correctable with the use of a modern orthopaedic surgical technique known as the Illizarov method . Illizarov external fixator is best indicated for tibial fracture because of its advantage of allowing early weight bearing.

Fixation in a circular /partial frame holding the illizarov wire going through bone connected with rods, connecting plates, hinges, posts washer, nuts and bolts.⁵ With these basic components different fram configurations can be assembled Key to success of the Illizarov fixator. The Ilizarov wire are introduced through safe zones to avoid injury of neurovascular structures .The rate of compression as well as distraction is 1mm/day.⁶

Case Note:

A 50 yrs old man Md. Amir Uddin hailing from Gazipur was admitted in Dhaka National Medical Institute

Hospital in the Department of Orthopaedic Surgery on 30.04.2012 with History of road traffic accident 6 days back. Pain & Swelling at left leg for 6 days. He sustained trauma at his left leg followed by bleeding from injured area. Then he attended to a hospital, where surgical toileting was done & limb was immobilized by long leg back slab. He does not give any history of fever during this period.



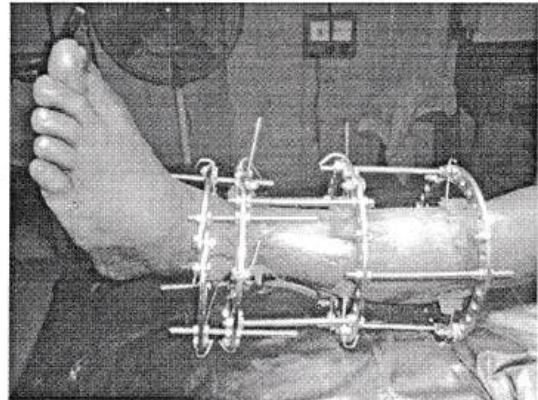
X-ray leg including ankle Immediate post operative x-ray

On removing the plaster there was an open wound about 2cm x 1cm diameter at the anteromedial aspect of the lower part of left leg. The area was swollen & shiny, slight serosanguinous discharge from the wound but not purulent. The area was found to be deformed & the foot externally rotated. Local temperature was slightly raised. Moderate to severe tenderness was elicited over the traumatic sight. Crepitus on deep palpation and painful abnormal mobility could be elicited. There was no distal neurovascular deficit. Active movement of ankle & knee joint was painful & restricted but full passive movement of both the joint could be possible. He is non diabetic, non hypertensive. CBC- Hb% 11.3gm/dl, TWBC-12000/cumm of blood, Neutrophil: 70%, Lymphocyte: 17%, Monocyte: 03%, Eosinophil: 05%, ESR: 35 mm in 1st hour, S.Creatinine:1.2mg/dl, RBS: 7.8mg/dl, Wound swab for C/S: No growth. X-ray left leg including ankle joint B/V showing : Comminuted spiral fracture of the lower 3rd of shaft of Tibia & Fibula (Lt).

Methods:

Under proper antibiotic coverage and immunization against tetanus, wound debridement & surgical toileting was done followed by reduction & immobilization by

Ilizarov External Fixator. Two Ilizarov wire introduced at different plane perpendicular to each other to correct angulation and rotation repeatedly. All the wires were inserted to circular rings. These were connected by continuous rods. Olive wire were introduced at place to correct angulation. The patient was attended to walk, bearing weight at the 2nd post operative week. Gradual compression was applied as per from the need of 3 weeks postoperatively. Fibula was left alone which gained reduction automatically.



X-ray leg including ankle and foot showing illizarov external fixator.

Discussion :

This case was reported as a 6 days old open fracture of the lower 3rd of shaft of Tibia & Fibula (Lt). Open fracture lower 3rd of the tibia is very common & usually results in non-union due to less blood supply in this area. Such a case is simply diagnosed by plain radiograph. Common cause are road traffic accident due to motorbike victim, fall during walking, fall from height, gun shot injury, Among them Road Traffic Accident due to motor bike victim is common.^{3,4} Under proper antibiotic coverage immunization against tetanus, wound debridement & surgical toileting followed by reduction & immobilization by Ilizarov External Fixator is treatment of choice. Ilizarov External fixator device has been proved to be effective and versatile method in the treatment of various difficult cases like gap non- union, infective non-union, unstable open fractures, pseudoarthrosis, as well as in limb-lengthening & correction of deformity etc. The idea of compression osteogenesis has been proved to be successful in this method. Although union is achieved in almost all cases of non-union, it takes a longer time for treatment. The patient can have an ambulatory life immediately after surgery, it minimizes

the anxiety & depression. Above all, this method is still the best option for the treatment of different difficult cases successfully.⁶



Patient walk with illizarov external fixator.

Ilizarov external fixator is remarkable versatile with each assemble custom made for any particular problem. The result are marvelous but there is poor patient acceptance, because of pain and cumbersome size & shape of the frame. The application of Ilizarov is refused by the patient and also less encouragement from orthopaedic surgeon due to tenderness of the procedure, dressing and prolong follow up.

We are convinced that this appliance should be more frequently used to achieved better result, where the conventional method are helpless. Use of external fixator like illizarov in the management of open & infected fracture has some complication like wound infection, pin tract infection, lessening of pin, neuropraxia, stiffness of joint & refracture.⁷

Conclusion :

The Ilizarov technique is very versatile & rewarding. Although it is a long treatment & needs patience both from patient & the family. But it can solve the problems which cannot obtained dealt with conventional method.

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