Vol. 15, No. 3
ORIGINAL PAPER

ORTHOPAEDIC

MEDICAL CHANNEL
JULY - SEPTEMBER 2009

ILIZAROV NEW TECHNIQUE FOR THE CORRECTION OF LOWER LIMB DEFORMITIES

1. **M. YOUNUS BALOCH**
M.B.B.S., M.S. Ortho
2. **LUTFULLAH BALUCH**
M.B.B.S., M.S. Ortho
3. **JAVED AHMED BADVI**

1. RMO, Orthopeadincs Unit-II
CIVIL HOSPITAL, KARACHI.
2. ***Assistant Professor***
Orthopaedic Unit-I,
DOW UNIVERSITY OF HEALTH SCIENCES & CIVIL HOSPITAL
KARACHI.
3. Pathologist
DOW MEDICAL COLLEGE
KARACHI.

CONTACT ADDRESS:
DR. MOHAMMAD YOUNUS BALOCH
M.B.B.S., M.S. Ortho
RMO, Orthopeadincs Unit-II
CIVIL HOSPITAL, KARACHI.
Cell No. 0333-3834245
0314-2011342

ABSTRACT

OBJECTIVE: *To find out the application of results of Ilizarov technique in correction of lower limb deformities. After correction of deformity during follow up of Ilizarov fixator application. The pin tract infection and role of antibiotics.*
DESIGN AND SETTING: *This is an analytic study done in orthopaedic Unit II Civil Hospital Karachi from March 2001 to March 2004.*
METHODS: *A wide range of lower limb deformities in 35 patients of different causes were selected from Ilizarov OPD. Patient of either gender age range from 6 to 60 years, were selected. After thorough examination they were admitted in ward and treated with Ilizarov apparatus. Postoperative hospitalization for 1 to 2 weeks. Fortnightly regular follow up were done for at least 8 to 10 months per patient.*
RESULTS: *Patients with limb inequality, genu varus and genu valgus, CPT, and foot deformities, neglected TEV were included, successful correction were obtained in 30 out of 35 patients, among those (14%) patients developed infection after correction. which was treated successfully with antibiotics according to culture and sensitivity.*
CONCLUSION: *Ilizarov fixator is an excellent and cheep method for lengthening and simultaneously correcting deformities of bones and soft tissues. The infection can be treated with culture & sensitivity test.*

KEY WORDS: Deformities Correction Ilizarov.

INTROUDCTION

Adults and children both can suffered from different deformities, like angular or rotational deformities and limb length discrepancy, there are congenital or acquired deformities, the acquired are due to infection trauma, metabolic and developmental disorder genu valgus or varus, and telepes equano varus are common deformities, these can be treated by corrective osteotomies, with or without soft tissue release or with or without internal fixation, but the operative procedure leave ugly scar and need removal later on, for these problems professor Ilizarov, in 1950 introduce new apparatus and more importantly, the biology of lengthening, by the technique we can treat, rotational, angular and translational osseous deformities with limb length equality[1-2] for these conditions the use of Ilizarov is more beneficial then internal fixation[3]. Foot deformities may be due to congenital, ligamental laxity or joint instability [4]. The use of Ilizarov in open fractures for all long bones are for reduction and stabilization. [5] Ilizarov can be used for the management of chronic ostromylitis by intercalary bone transport [6] most of the angular deformities with normal physiologic development corrected without any treatment, only 25% to 15% of patients has pathological deformity require correction by brace or surgery [7]. The short femer congenitally has not difference in length but also has difference growth rate, which has significant growth inhibition [8]

This Ilizarov technique has more advantages than other methods, bone union is achieved without bone grafting, it provides new tool to correct congenital and acquired deformities. This method include the rings with interconnected rods and bone is fixed with wires given tension to raise their rigidity. The bone is osteotomised, followed by starting distraction, at the rate of 1 mm/24 hours in 4 equal increments to avoid bone grafting or internal fixation.[9] Soft tissue under go lengthening along with bone, inspite of stretching, the slow distraction is not disturbing the callus but rather stimulate osteogenesis.[10]

The Ilizarov advantages include: -

- Easy to adjust at any stage.
- Mobilize the patient.
- Minimal surgical scar.
- Ilizarov fixator can be removed without general Anaesthesia.

In our orthopaedic Unit II use of Ilizarov technique is from last 12 years, we are using the method in open fractures and different kind of lower limb deformities primary or secondary to some illness.

PATIENTS AND METHODS:

We have done study over 35 patients belongs to Karachi and other parts of country with different kinds of lower limb deformities to apply Ilizarov method in orthopaedic Unit II Dow University and Civil Hospital Karachi during 2001 to 2004. In this Unit Ilizarov is also used in various open fractures, non unions and also in some upper limb problems.

The patients were admitted through OPD, from those 21 males and 14 were female and age range from 05 to 60 years, with 8 patients which operated before, the femur were involved in 12 tibia in 28 and foot deformity in 05 patients.

In our Unit we have divided the patients in 04 categories.

1- Deformity of limb with limb length discrepancy.
2- Deformity without limb length discrepancy.
3- Limb length discrepancy only.
4- Congenital pseudoarthrosis tibia.

We were admitted the patients from Ilizarov OPD with different deformities. Ilizarov clinic were arranged 02 days in a week.

History and clinical exam were done there, for functional deficit or weakness, and patient were councelled about the complications duration of treatment and expenses of treatment as well and then patients were given date of admission.

Post operative success is depend upon preoperative planning four ring apparatus is made usually with 1.5mm to 1.8 mm wires connected with inter connected rods with nuts and boults, half ring were used in metatarsal and in calcaneum, wires given tension after application.

Corticotomy were done where bony correction or lengthening required, corticotomy were performed through small incision and then periosteum is elevated by the help of osteotome the osteotomy is performed, image intensifier, or X-Rays is used to confirm corticotomy with different views.

On the day or two following surgery we allow the patient to walk with full weight bear, distraction started after 7 to 10 days at a rate of 1mm / day in 4, hourly intervals (.25mm/6hours)

Physiotherapy started on the 1st Post Operative day. In lengthening and deformity correction patients were checked after every 2-3 weeks with new x rays then clinic visit reduced to 4 to 5 weeks in consolidation phase, in every check up we also access the range of motion of joints, after complete regeneration accessed radiologically, after completion of union the frame is removed in minor 0.T in some sedation, after removal back slab support was given for 02 weeks then K.F.O (Knee foot orthrosis) or A.F.O (ankle foot orthrosis) were given and patient advised for walk with full weight bearing.

TABLE I

DEFORMITIES

CAUSES	Percentage and No. of patients	Corrected Deformities	Deformities
Trauma	02 (06%)	Limb length Discrepancy	02
		Equanous foot	01
		Genu volgus	01
Idiopathic	01(3%)	Talipes equanous	01
Congenital	04(11%)	Pseudoarthrosis fibia	03
Developmental	06(17%)	Genu varus	05
		Genu valus	.05
Poliomylitis	14(40%)	Limb length discrepancy	01
		Flexion contractures knee	03
		Genu Valgus	02
		Equanous foot	02
Infection	05 (14%)	Coxavora	01
		Limb length discrepancy	03
Metabolic	02 (06%)	Anterior bowing tibia	01
		Coxa vara	01
		Limb length discrepancy	01
	01 (03%)	Genu varus	02
Total	35 (100%)	Total	35

RESULT:

Study of 35 patients with limb inequality, genu valgus genu varus, CPT, foot deformities, successful correction was obtained in 30/35 patients, deformities mentioned in table I.

The corrected deformities mentioned as:

(a) The 14 (40%) patients with lengthening of limb inequality up to 3 to 8 cm.
(b) The angular deformities corrected in 06 (117%) patients of genu valgus (17° to 18°) and varus (for 18° to 24°).
(c) Knee with flexion contracture were corrected in 03 (8%) patients (15° to 30°)
(d) coxavara corrected in 02 (5.7%) patients. (range from 80° to 95°)
(c) The post traumatic contracture patients were excised the site of pseudo-orthrosis 4-5 cm, then started bone transport.
(f) Foot deformities corrected in 04 (11%) patients. surgery time was 90 to 130 minutes, average treatment time was 155 days & average duration of apparatus was applied up to 130 days. The regular follow up of the patients initially, fortnightly than monthly for

1 to 3 years up to clinical & radiological achievement of the result.

DISSCUSSION: -

Various techniques are there in correction of lower limb deformities with limb length discrepancy like corrective osteotomy with internal fixation done, but this is reasonable in lesser magnitude deformities with common limitations the immediate correction and internal fixation is greater, the inability to modify post operative gradual correction .[11]

By application of Ilizarov method and by distraction osteogenesis the need for bone graft is quite reduced and gives help in the treatment of multiple deformities [12].

Achieving of lengthening of many centimeters in a straight line could be possible by application of external fixator [13], but whenever the question is lengthening along with correction of deformity the Ilizarov method is very good for that solution. [14]. The Ilizarov method allow gradual correction without shortening of bone, the assessment and viability of soft tissues and correction is done accordingly[15]. Treatment is continued even after leaving operation theatre in the ward. Patient is advised for no hurry. The sever kinds of deformities can be corrected by Ilizarov method Pin track infection was common complication might be due to stretching of skin, equanous foot was seen in cases with correction of limb length discrepancy. Three patients has premature fusion and out of them one was turning reverse nuts, regenerate becomes collapsed in patient who have lengthening upto 10 cm and after length achieved the fixator was removed might be cause of early removal and weight bearing although good callus was there radiologically, one patient had proximal tibiofibular joint dislocation during lengthening because head of fibula not stabilized initially.

Post operatively, minor complications was adjustment and removal of wires, major complication include recorticotomy in 03 patients, one patient had quadiceplasty, one patient had transposition of ligamentum patellae and in six patients we have done elongations of Tendo achillel hospital study was from 8 to 70 days, only 04 patients has study of 03 months, average time for the removal of fixator was from 60 to 270 days more than 200 days in 05 patients, because of radiologically no consolidation. Ilizarov is good method of limb salvage but also cost effective.

CONCLUSION:

Ilizarov method is proven tool to treat limb lengthening and different correction of deformities like pseudo arthrosis, which was previously was difficult to treat and families and surgeon were willing for amputations. After all Ilizarov gives unique advantage to treat lengthening and deformity correction at same time. Thus the use of Ilizarov ring fixture in the correction of deformities and limb lengthening is very successful and can be strongly recommended, with acceptable complications and duration of treatment. While risk of infection can be over come by appropriate antibiotics treatment, after culture and sensitivity.

These patients can walk attend normal activities include school & college, appear with Ilizarov ring fixator is in place.

REFERENCES:

1. R.J. Velazquez, D.F. Bell Armstrong et al, complication of use of Ilizarov technique in the correction of limb deformities in children. The journal of Bone and Joint Surgery, 1993; 1148-56.
2. Ilizarov G.A clinical application of tension stress affect for limb lengthening, clinical orthopaedics 1990-8-26.
3. Mateen M. A Ilizarov technique in orthopaedic surgery. The journal of surgery 2001; (23, 24) : 10-12.
4. A Graham Apley Louis Solomon. The ankle and foot, Appley's system of orthopaedic and fractures 7th edition, 1993 471-498.
5. Jason H. Calhoun, Fan LI Billy, Led Better and Craig A. Gill, Biomechanique of Ilizarov fixator for fracture fixation clinical orthopaedics and related research July 1992, 15-23.
6. Smrke D, Arnez ZM. Treatment of extensive bone and soft tissue defects of lower limb by fraction and free flap transfer injury, 2000, (3):153-63.
7. Thomas F-Kling Angular deformities of lower in children. The orthopaedic clinic of North America 1987, 513-527.
8. Clinic F-Moseley Leg length discrepancy. The orthopaedic clinic of North America 1987 529-535.
9. De, Bestiani, Aldegheri- Brevio, R-Limb Lengthening by callus distraction Journal of paediatric orthopaedics 1987; 129-134.
10. John H. Herzenberg and Nicholas A Wanders calculating rates and duration of distraction for deformity correction with the Ilizarov technique. The orthopaedic clinic of North America Oct; 1991 P 601-611.
11. Kevin D Test worth Dror paley. Accuracy of correction of complex extremity deformities by Ilizarov method, clinical orthopaedic and related research 1994 P 102-110
12. Mark T Dahl, Benjamin Gialli and T Roy Berg Complication of limb lengthening clinical orthopaedic and related research 1994 P 10-18.
13. K. Korzinck. S Tepic, S. M. Perren Limb lengthening and three dimensional deformity correction. Acchives of orthopaedics and trauma surgery 1990 P 334-340.
14. J Kenwright FL Cummingham External skeletal fixation which form and why? Recent advances in orthopeadics 1992 P 27-40.
15. Fernanlo DE, LA, Heurza. Correction of neglected club foot by Ilizarov method clinical orthopaedic and related research 1994 P 89-93.