



## Use of Ilizarov Fixator in Deformity Correction

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### ABSTRACT

*The aim of this modality of treatment is to achieve correction of deformity in limbs. The principle of Ilizarov has been applied to correct limb length discrepancies, deformity correction in relation to joints or shaft of long bones. The principles of distraction osteogenesis have been applied*

**Objectives:** *To evaluate the efficacy of Ilizarov principles in the treatment of deformity correction.*

**Materials and Methods:** *this was a prospective study of 40 cases at Government Medical College, Thiruvananthapuram. Functional and anatomic result were assessed using goniometric measurements and radiology.*

**Result:** *Effective method for deformity correction with less invasive surgical techniques. Limb length discrepancy can be corrected simultaneously.*

**Conclusion:** *Excellent results for deformity correction in our study of 40 cases.*

**Keywords:** *Deformity correction, Ilizarov, distraction osteogenesis.*

### BACKGROUND

Ever since the evolution of orthopaedic surgery grotesque deformities have been a constant source of worry to all orthopaedicians. Fracture nonunions have been associated with deformities. The numerous prevalent techniques were inadequate to counter the challenges.

It was into this background Dr. Gavril Abramovich Ilizarov (1921 - 992) came from an economically backward Jewish family from Kurugan, USSR. He worked wonders with his theory of distraction Osteogenesis which ran contrary to the prevalent basic tenets of orthopaedics.

Ilizarov's basic principle was distraction osteogenesis to produce regenerate bone. He devised versatile rings with interconnecting rods, which could be moulded and fashioned in such a

way as to correct deformities using the above principles. Using these frames he demonstrated techniques to correct uniplanar or biplanar deformities of long bones, realign malformed joints and also to achieve bone lengthening in short stature

### MATERIALS AND METHODS

This prospective study was conducted in Department of Orthopaedics, Government Medical College, Trivandrum 40 cases of various types of deformity including those with non-union, joint based deformities and short stature were included in the study. All patients had received unsuccessful treatment attempts at deformity correction. The results were evaluated depending on bony deformity correction and

functional evaluation using cosmesis, secondary complication and residual pain.

## RESULTS

Table depicts the breakup of 40 cases included in the study

**Table :1**

	No	%
Deformity associated with non union	14	35
Post polio residual paralysis	6	15
Achondroplasia	4	10
Osteomyelitis	6	15
Pseudarthrosis tibia	4	10
Congenital talipes equinovarus	4	10
Epiphyseal Injury	2	5

## Anatomical site incidence was

**Table :2**

	No	%
Tibia	16	40
Femur	12	30
Foot	8	20
Humerus	2	5
Forearm	2	5

The age of the patients ranged from 5 to 45 years

Maximum patient was in 4<sup>th</sup> decade – 30%

All patients have received unsuccessful treatment for their deformity correction before Ilizarov technique was applied.

**Table : 3**

	No	%
Internal fixation	12	30
Plaster of Paris application	8	20
External fixators	10	25
Combined procedures	10	25

Classification of non union

**Table : 4**

	Cases
A 2 – 2 stiff with fixed deformity	6
B 2 Shortening without defect	4
B 3 shortening and bony defect	4

The average time for deformity correction on Ilizarov frame was 8 to 10 months. Failure occurred in 3 patients. All other were successfully rehabilitated. The failures also had partial return

back to social life. Duration of follow-up of patients ranged from 6 months to 2 years.

**Table : 5**

**Complication observed were**

	No	%
Pin track infection	4	20
Ring Sequestrum	2	10
Axial deviation	4	20
Failure	3	18
Apparatus instability	2	10
Nerve Injuries	2	10
Metal reaction	2	10
Injury	1	5

The status after follow up was assessed by

1. Residual bony deformity
2. Associated bony union and
3. Limb length discrepancy

Final result grading was done based on a total of 6 parameters which included the 3 above and the following 3

1. Clinicoradiological
2. Functional and
3. Cosmetic

**Table : 6 Final result grading**

	No	%
Excellent	14	35%
Good	14	35%
Fair	6	15%
Poor	6	15%

## DISCUSSION

In this study 35% of deformity was due to persistent nonunion of fracture. The mean age was 34.2 years. Steward Grice et al reported a mean age of 33 yrs mainly in deformity with non union and the average duration of disability was 128 weeks for non union alone. K. Tetsworth et al had mean age of 29 yrs and the average duration of disability was 96 weeks.

Overall this is found to be one of the most suitable methods for deformity correction as it is semi-invasive and provides histiogenesis and hastens healing of infection if any. The versatility and stability of the apparatus allows for corrective

procedures and ensures weight bearing during treatment.

## CONCLUSION

Deformity correction whether cosmetic or associated with non union is a great challenge for any orthopaedic surgeon. Ilizarov technique allows for histiogenesis that aids in deformity correction as well as osteogenesis that ensures union in deformity associated with non union.

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