

History of Ilizarov Technique in Bangladesh: A Brief Review

Bari MM*, Islam Shahidul, Bari A.M Shayan R

**Bari-Ilizarov Orthopedic Centre, Dhaka, Bangladesh.*

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ABSTRACT

Background and purpose: Bangladesh Orthopedic surgeons have made a substantial contribution to the development of Orthopedics in the world over. We make a brief review of development of Ilizarov surgery in Bangladesh and I would like to intend to give the way for farther understanding of Ilizarov surgery for the Orthopedic surgeons all over the world.

Methods: Between January 2000 and January 2018, 28 patients (20 males and 8 females) with big defects following infection and post traumatic injury of the tibia were treated. The mean age of the patients at the time of surgery was 15.3 years (4-24 years). The Tibula was mobilized medially to till the defect and was fixed with Ilizarov Fixator. The average size of the defects reconstructed was 7.35 cm (6-10 cm). Patients were evaluated functionally using the ASAMI scoring system.

Results: The Ilizarov technique, its biological law of tension stress theory, experience and treatment strategies plays an important role in treating Orthopedics and Trauma disorders in our country. For the last 3 decades Bangladesh Orthopedic surgeons have made great gratifying achievements Orthopedics and Trauma surgery.

Conclusions: Orthopedics and Traumatology is constantly evolving, and we must strengthen the new Ilizarov innovation to serve our poor patients.

Keywords: Ilizarov, Bangladesh Orthopedics and Traumatology

INTRODUCTION

With a population 170 million, Bangladesh is a small country with substantial diversity of economic development health care systems. A recent reported demonstrates that the incidence rate for traumatic fractures was 4.5/1000 in 2018. After the liberation war in 1971 the Bangladesh Orthopedic surgeons have made a substantial contribution to the development of Orthopedics and Traumatology worldwide. Ilizarov compression-distraction osteosynthesis system is an independent sector in Orthopedics & Traumatology has got definite history of its own development [1]. Utilization of this method in orthopedics attracts many scientists with opportunity without considerable surgical trauma to eliminate severe congenital and acquired deformity which is connected with great regeneration. Indisputably facts remain that compression distraction method opens new era instead of using traditional methods of surgical interventions [2-6].

In 1952, Academician Prof G. A. Ilizarov G A Ilizarov developed a principle of trans osseous apparatus consisting of wires and metallic rings widely used in Soviet Union. Since then this versatile method has been used in Kurgan of Russia for the next 68 years [7]. In 1981 in Italian AO meeting in Bellagio, Italy, Prof. Ilizarov presented three topics: Treatment of open fracture, the treatments of post-traumatic osteomyelitis, bone lengthening. And that was the first western conference outside Russia.

In Bangladesh this method becomes popularized in early late eighties. Now a quiet good number of orthopedic surgeons gathered knowledge and practice this method in their orthopedic management. In our country orthopedic surgeons invariably face some terrible situations like open fracture, open fracture with bone loss, post-operative or post traumatic osteomyelitis with implant in situ and chronic osteomyelitis along with low socioeconomic condition of our country. For all these cases there is no answer but Ilizarov. In some problems that have historically been refractory to standard treatments such as congenital pseudarthrosis of tibia and severe hemimelia's, the Ilizarov solution should be considered primarily because of proven results. Amputation stump can be lengthened to facilitate prosthetic wear and, in some cases, eliminate need of prosthesis. Thin bone can be made wider both strengthening and cosmetically shaping limbs such as polio, club foot.

Corresponding author: Dr. Md. Mofakhkharul Bari, Professor PhD, Chief Consultant, Bari-Ilizarov Orthopedic Centre, Visiting and Honored Professor, Russian Ilizarov Scientific Centre, Kurgan, Tel: +8801819211595; E-mail: bari.ilizarov31@gmail.com

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Many tumors of bone can be managed by resecting tumor part and gap can be minimized by bone lengthening. Now it is evident that Ilizarov method covers almost all pathology of locomotor apparatus [8]. This method involves minimum invasive procedure with least hemorrhage and joint sparing surgery permit early mobilization and weight bearing which enhances early bony consolidation. Deviation from normality is called deformity. Deformity cannot be accepted by anyone. Academician Prof G. A. Ilizarov has introduced an excellent technique for managing various problems of musculoskeletal system including fixed deformity. The principle behind his technique has got 4 contributions:

1. Law of tension stress (Biological law) slow and steady traction on a living tissue creates a stress that become metabolically activated which results in an increase in proliferative and biosynthetic functions
2. Methods of corticotomy
3. Distraction osteogenesis
4. Myriads of fixator [9]

Proper passing of Ilizarov wires, exact point of entry and exit of wires and proper placement of rings have definite role in excellent outcome. Academician Prof. Ilizarov was always fond of saying “No surgeon is justified to do any reconstructive surgery by Ilizarov technique unless he or she has got the competent idea regarding the technique and apparatus” [10]. We should know the basic principle of Ilizarov technique, the hardware, proper selection of patients, safe corridors of the placement of wires. Understanding of kinesiology and kinematics, anatomy and basic physiology are mandatory before attempt to master this Ilizarov technique [2]. Development in orthopedic surgery in the past 4 decades have indeed remarkable particularly so with regard to compression-distraction method. Reconstruction by Ilizarov technique is an art and skill, which can only be mastered by the discipline of observation and practice. Ilizarov method has now gained a strong foothold in Bangladesh. Other techniques in orthopedics, one can learn in one or two weeks but this technique one cannot learn in a short period of time. There is a training Centre named Bari-Ilizarov Orthopedic Centre which is located at 1/1 block #E, Lalmatia, Dhaka-1207, Bangladesh. From 2015, 19 local Orthopedic surgeons and 11 foreign (Nigeria-4, Malaysia-3, UK-1, India-1, Korea-1, Jordan-1) Orthopedic surgeons got fellowship from this centre.

Introduction of Western Orthopedics and Traumatology into Bangladesh

The plaster and fraction technology were also introduced in Bangladesh long before because of their simple and effective results which still in broad use today. Besides looking, facing, moving and measuring from Orthopedics we get more objective examinations. Bangladesh Orthopedic society is an Association of Orthopedics and Traumatology

surgeons in Bangladesh. After the liberation war under the guidance of the father of the nation Bangabandhu Sheikh Mujibur Rahman. Dr. Ronald Joseph Garst, a missionary Orthopedic surgeon from USA had come forward to give treatment to the war injured freedom fighters. He established RIHD (Rehabilitation Institute and Hospital for Disabled) which is now known as NITOR (National Institute of Traumatology & Orthopedic Rehabilitation). Bangladesh Orthopedic Society was found on 24th August 1979 with the objective to establish cooperation among the relevant association in home and abroad for developing the Orthopedics and Traumatology to world highest level.

Bangladesh road accident

Transportation network in Bangladesh has progressed substantially in the past three decades. In 2019 1075 Noble accidents occurred with high mortality rate of traffic injury. The major reason for so high mortality rate is the inefficiency of Bangladesh traffic injury rescue system. Preliminary results showed that the application of advanced rescue and treatment procedures could significantly reduce the rate of fatality and disability of people involved in severe trauma.

At least 5,227 people were killed while 6,953 injured in 4,702 road accidents across the country (Bangladesh) in 2019. The number of road crashes and deaths saw an alarming rise last year compared to the 2018. The victims who were killed in road accidents in 2019 more than 50% were pedestrians. The statistics has been prepared on the basis of reports 11 national dailies, online news portals, TV channels and information collected from the branch offices of the organization. Unskilled and uneducated drivers, faulty vehicles and roads, poor traffic management, lack of awareness about traffic laws and use of road among peoples, lack of political will and proper implementation of laws are to be blamed for those crashes.

A total of 3,103 road accidents killed 4,439 people and injured 7,425 others in 2018, this was disclosed by “Nirapod Sharak Chai” safe road demand chairman [6].

Stage of Ilizarov surgery moves towards world

Bangladesh Orthopedic society has made brilliant achievement in Ilizarov. Spine, hand, arthroscopy, arthroplasty and pediatric aspects particularly in the treatment of orthopedic diseases and application of new technologies and our achievements in Ilizarov surgery have reached the world advanced level. After more than 34 years of development of Ilizarov surgery Bangladesh Orthopedic society already processes Ilizarov and Orthopedic rehabilitation other academic activities nicely. Bangladesh Orthopedic society and its branches has greatly improved our level of Orthopedic treatment and academic activities. In addition, BOS (Bangladesh Orthopedic society) has joined several famous international organizations such as ASAMI, APOA, SICOT, EFORT, EOF.

Minimally Invasive Surgery (MIS) by Ilizarov technique has gained popularity in the last 3 decades and due to its minimal invasion, fewer complications, excellent recovery and expense is reduced. Biological Osteosynthesis (BO) is

one of the excellent concepts in the management of deformity correction and orthopedic trauma which is widely applied in my country (Figure 1).



Figure 1. Ilizarov surgery in severe open infected fracture (A, B, C) Open infected fracture G(III)B with uniaxial fixator in situ (D) Radiograph of right tibia-fibula with uniaxial fixator in situ, done elsewhere. (E) Picture of 1st day in OR (F) After 4 months (G) 5 months follow-up (H) 9 months follow-up (I) Radiograph of right tibia-fibul.

Many people ask me “How did you get into Ilizarov technique?” I would like to acknowledge the mentorship and support of many people by telling the story of my Orthopedic Ilizarov journey. The most complex and post-traumatic problems were bone loss and large deformity and nobody could give a good solution for these. That’s why I have taken a decision to pursue fellowship in Kurgan (the

mother institute) under the guidance of Prof. V.L. Shevtsov, the successor of Prof. G.A. Ilizarov and that was life changing for me. I was totally amazed by his clinical work. He is a great teacher and a great man and I am indebted to him for teaching me the tools of this amazing technique. Limb lengthening and reconstruction of deformity is an exciting new discipline in the Field of Orthopedic surgery.

In Kurgan I met N.M. Marzhuk, V.M. Shegirov, Y.P. Saldatov, K.I. Novikov, N. Shikhaleva. I worked with them on clinical and academic pursuits and they exposed me to many aspects of the classic Ilizarov method. Orthopedic conferences have been very productive for the sharing of ideas and knowledge. That's why I am travelling every year 6 to 8 times in different countries to share knowledge and exchange views regarding the orthopedic problems [2].

We have come to appreciate the many indications for the Ilizarov method. I owe a great deal of gratitude to Prof. G.A Ilizarov, the great self-taught orthopedic surgeon, a pioneer genius with distinguished academic activities [3]. Ilizarov's work inspired the formation of ASAMI, which is an international academic society with national branches and fortunately I am the President of ASAMI, Bangladesh Chapter at present. I always encourage doctors who are interested in this field to become the member of this association. It is a place where we can learn, share ideas and meet fellow "Ilizarovians". In 2010, June 16-19, we attended 6th ASAMI International Conference in Cairo for sharing new information regarding the orthopedic problems. Bangladesh is the life member of this society. In June 2012, a 22-member group from ASAMI attended the 7th International Conference in Greece. In September 18-21, 2014, 24 members attended the 8th International Conference in GOA in 4th-7th November 1st Combined meeting of ILLRS-ASAMI, BR meeting was held in MIAMI, USA, in 20th-24th September 2nd ILLRS-ASAMI BR-Congress was held in Brisbane, Australia, 2016 with 38 members from Bangladesh, in 29th-02nd September, 2017 3rd ILLRS-ASAMI BI Congress was held in Estoril Congress, Portugal [4,5].

Bangladesh Orthopedic scholars have made some gratifying achievements in the development of Orthopedics, especially in Ilizarov surgery. However, we are still lacking in innovation of basic research. This article reviews the history of Ilizarov Surgery in Bangladesh and it gives a brief understanding of Bangladesh Orthopedics, especially Ilizarov Surgery to the foreign orthopedic specialists. Orthopedics is constantly evolving; we need to strengthen the ability of independent innovation to achieve Orthopedic Surgeons Bangladesh in dream and better serve to our patients.

ETHICAL CONSIDERATIONS

Compliance with ethical board review statement: This material has not been published and is not under consideration elsewhere.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interests. All authors clearly stated that no benefits had received for this study.

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