Lengthening
&
Deformity correction
with
Fixator Assisted Internal Fixation
External Fixation

as

*Intra-Op Alignment tool

* for lengthening
the ilizarov fixator is the best for difficult deformity correction & limb lengthening.
You can correct any deformity
Achieve great results & be tempted to believe you need no other device!
However, we sometimes feel Ilizarov exfix is cumbersome to wear
For long in these modern times!
So we can use more convenient fixators like the LRS & Taylor Spatial Frame fixator.
To achieve perfect alignment even in subtle deformities like this lady from Sweden did.
ExFix Duration!

The biggest problem is TIME!
Limb Lengthening

Min 45 days / cm

Deformity correction

Min 4 to 5 months
We all love to travel!
But know that the most important journey is inwards.
Lengthening over Nails

We began this journey in 1994—the effort to reduce exfix duration
Lengthening 7 cm with Ilizarov would take no less than 11-12 months.
A Modified humerus nail to match the lower herzog curve was used. An Ilizarov fixator with minimum pins was used.
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Happy patient with equal limb lengths in a very short exfix time

Ex-Fix
Removed in 3 months
& IM nail locked distally.
8 cm shortening of femur. Lengthening using an ExFix would take no less than 10 months, with a risk of knee stiffness.
Perfect marriage of internal device inside & gives static support. External device that can do lengthening easily.
Nail is locked distally and exfix removed in 4 months. Equal lengths and Full ROM. Lengthening over an IM nail we performed similarly in many more cases. But when it comes to….
Deformity correction, the surgical technique difficulty goes up by several notches as we discovered over time
Early Failures
We tried correcting the Genu Valgum with IM Nails and had to seek recourse to the trusty Ilizarov to save the day.
We similarly failed to correct this varus & lengthen over an IM nail. The patient ended up with residual shortening & deformity.
we discovered the truth of what the big boss said to his junior consultant several thousand years ago.
आधिपालं तथा कर्ता करणं च पृथाग्निधिम्।
विविधान्ता पृथक्कोश्तः दैवं चैवान्त्रा पुष्चमस्।
We need a specially equipped OR
कर्ता = Surgeon

Paley  Baumgart  Kocaoglu  Chaudhary
पृथग्विधम्  = Spl. Instruments

Full Length X-ray
Entry Point accuracy
Straight Rigid Cannulated Reamers = Spl. Instruments

Straight Nails
- Accurate Guide Wire positioning
- IM Nailing Skills
- ExFix Pin placement
- Percutaneous osteotomy
- FU care
Indications / Favorable Circumstances

- No previous Infection
- After Physeal closure
- Negotiable canal
- No sclerosis
Valgus FEMUR with OA
Lat Compartment OA due to valgus
Fixator Assisted nailing-small incisions, straight IM Nail, Poller screws
Valgus & Shortening
Adolescent & overweight, she wouldn’t tolerate exfix for long....
Guide wire is inserted at 81° to joint line, starting instruments enlarge the track. Two Poller screws are inserted on either side to narrow the track of the intended nail.
Osteotomy translated laterally with help of exfix pins and Poller Screws. Nail locked distally. Addnl Poller inserted medial to nail proximally to prevent chances of loss of correction by translation. LRS fixator well tolerated.
Limb lengths equal and deformity corrected. Ex fix time 6 weeks.
Valgus & Procurvatum
Severe Genu Valgum, short stature. L side lengthening & DC with exfix.
Excellent correction & 7 cm length gain. 7 month exfix duration
We analysed the deformity on R side, planning for FAN method.
Exfix pins are inserted behind track of intended nail passage. Small opening in knee allows guide wire accurately passed, over which reaming is done.
GW passed exactly at 81° to joint line. Starting point instruments and thin walled reamers inserted over it. Osteotomy site marked.
Poller screws are seen in narrowing the track of the reamers preventing the widening of the nail track.
Nail passed thru narrow track. Where it encounters a deformity at the upper level it is osteotomised and nail passed thru. Locked at all three levels.
Tibial nail inserted from centre valgus deformity corrected. Nail stabilized by locking screws as well as Poller screws in both fragments. Lengthening in progress.
Good correction with accurate alignment and lengths equal
Varus Femur
Varus deformity due to growth arrest with short Left limb.
Varus in lower femur corrected well with straight nail, tibia lengthening, angular and rotation correction with Ilizarov fixator well tolerated.
Left limb completely straight. notice the subtle Medial translation of distal fragment & use of Poller screws.
Finally mild varus on R tibia corrected with a Focal Dome osteotomy. Perfect alignment and limb lengths equal.
Double Level correction
Varus & Procurvatum
Varus deformity, procurvatum & shortening in CP and growth arrest.
Double level osteotomy performed with good correction.
Varus & Shortening
Varus Malunion with shortening in a software engineer.
Nail inserted antegrade. Lengthening osteotomy made proximally. Distal correction of varus MU. LRS allowed him to return to desk job.
Limb lengths equal, Alignment same as on other limb. Exfix time only 6 weeks.
Procurvatum & Shortening
Hand to Knee gait with shortening due to Polio. 28 yr old Actor
Exfix duration only one month. Straight knee. Equal lengths.
Varus & Shortening + Instability
35 yr old teacher has unstable ankle with shortening due to Polio
Distal entry nail after arthrodesis of ankle. Lengthening corticotomy just proximal to ankle. Intervening fragment locked. Ilizarov fix for 2 mths.
Stable and plantigrade ankle with 3 cm length achieved.
Stature Lengthening
Opthalmologist wanted 2 inches stature increase. LON method used.
Exfix duration of 14 weeks. 5 cm length gain with good alignment
सहजं कर्म कौन्तेय सदोषमापि न त्यजेतं।
सर्वारसम्भा हि दोषेण धूमेनागिनिस्विब्राहृता:।।
COMPLICATIONS
Premature Consolidation
15 cm shortening due to growth arrest. Tibial correction with Ilizarov
Nail inserted in femur from proximal end, but locked distally.
Nail extracted partially. Repeat Corticotomy done. Lengthening resumed.
7 cm length gained in femur. Exfix duration 4½ months
Lengths equal, alignment good with full function.
Deep Infection
30 yr old banker with CMD. 5 cm length gain with LON. Deep infection.
Nail removed, reaming, ABC rod inserted. Fixator retained for longer. Problem solved.
SCO with femur lengthening over nail. Knee Stiffness.
Quadricepsplasty!

Full knee flexion achieved after Quadricepsplasty
High Tibial Osteotomy
Medial opening wedge osteotomy is very reliable for correction of small Varus deformities with medial locked plating.
With large deformities (masked by FFD here), opening wedge can have problems. Exfix not tolerated at this age.
Good pain relief and excellent function.
Special tools needed = long cassettes & tall xray machine
The Future is here!
Gradual correction of varus deformity in medial compartment OA
Instability & Shortening
PRECICE HTO nail inserted after medial opening wedge osteotomy
ERC= External Remote controller gives gradual and accurate correction
Full Correction achieved.
Is ideal for accurate correction of smaller deformities
Thank You!

www.ilizarov.org
Dr. Milind Chaudhary

- Director,

- Centre for Ilizarov Techniques

- Akola

Consultant

Jaslok Hospital

Mumbai, India