Principle of Fracture fixation

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Contents

- Definition of fracture
- How to make diagnosis?
- Why do we need to operate?
- Different type of fixation
- New technique
Fractures is a break of continuity of bone
- Non displaced fracture
- Complete fracture
- Green stick fracture
- Impacted fracture
- Closed or open fracture
Fractures

- Transverse, oblique, spiral
- Comminuted, wedge, butterfly
- Diaphyseal, metaphyseal
- Articular,
- Pathological, osteoporotic
Closed Fracture
Neglected Fractures
Signs and symptoms of Fx

- Pain
- Swelling
- Deformity
- Unable to move
Investigation

- X ray AP lateral (oblique)
- X ray special view
- CT scan 2D, 3D
- MRI ,3D reconstruction
- Bone scan
CT scan
47y. 43-C3, IIIA open pilon fracture, motorbike injury
50y
Female
Fall from height
Preop planning
Treatment of fractures

Do not operate
May operate
Must operate
Do not operate
(conservative)
May be operate
Must operate
Treatment depends on Patient, Injury, Care team, and Resources.
Indication should be the same for your patient and yourself.
What would I do if this case was my son, wife, mother, brother...?

If in doubt consult, refer!

MUST I?

MAY I?

CAN I?
Complication from Osteosynthesis

Swiss

German

Italian

British
Consultation Process

Line Application
- BDMS Fracture Group
- BDMS H&K Network

BMC Consult

Tele Consultation

Tele Video Conference
Case that require consultation

- High Risk and High cost
- Tendency to be RM case
- Reoperation case
- Surgeon has no competence
Why do we need ORIF

- Save life
- Save limb
- Save function
- Save time
- Save money
Types of internal fixation

- K wire and pin
- Intramedullary nail
- Plates
- External fixators
More Stability

Less vascular/biologic damage

- K-wires
- Ex. Fix
- IM Nail
- Bridge Plate
- Lag Screws Protection Plate
PLATES
Comparison between nail and plate

- **Nail**
  - Use more in long bone
  - Can be done by closed method
  - Contraindication in growing child
  - Require more instruments
  - Allow early weight bearing

- **Plate**
  - Use more in upper extremity
  - More stable in rotation
  - Common in growing child
  - More application in periarticular fracture
  - More use in delayed and nonunion
  - Can be done by closed method
Fracture access

From open ....

....to MIPPO techniques
Evolution of Plate Osteosynthesis

70-80

80-90

90-2000
**MIPO**

**M**inimal invasive
- Small incisions
- Minimal trauma to the soft tissue and the bone ("small footprint")
- Minimal additional trauma at the fracture site

**P**ercutaneous (plate, nail E.F. K Wire)

**O**steosynthesis
External Fixators
Indications

- Open fractures
- Closed fractures
  - Polytrauma
  - Severe soft tissue injuries
  - Indirect reduction
- Bone and soft tissue loss
- Infection
Bone transportation
Ilizarov
Goals of operative treatment

Alignment  Bone Healing  Full Function
Goals of operative treatment

Stability

4S

Safety

Soft tissue

Surgical technique
Conclusions

- Orthopaedic trauma treatment has evolved into a specialty.
- Overall results have improved after AO.
- Fracture has different complexity.
- New techniques will improve better outcomes in fracture treatment.
Conclusion

• Treatment of fracture 3 possible ways
• User the correct indication for operation
• Reduction techniques: direct vs indirect
• Different choice of implants to select
• New techniques: less invasive, MIO,
Thank you for your attention