

Boxers Fracture Treated With Antegrade Prebent K Wire Vs Conservative Management In Young Adults

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❖ ABSTRACT

Introduction:- A prospective study of boxer's fracture treated with antegrade prebent K wire and conservatively in young adults.

Material and method:- In Krishna Institute of Medical Science Karad Satara from July 2017 to July 2019, 20 patients of 5th metacarpal neck fracture were studied, 10 were treated with antegrade prebent K wire and 10 treated conservatively were selected, children younger than 15 yrs and fracture involving articular surface were excluded.

Observation:- Boxers fracture are 20% of fracture encountered in hand majority of patients are male with right hand involvement majority of cases were due to hitting an hard object with closed fist.

Conclusion:- Percutaneous fixation with prebent K wire in antegrade direction gives better results as compared to conservative management which is usually associated with shortening and angular deformities.

Keywords: Boxer fracture, Fixation, management

❖ Introduction

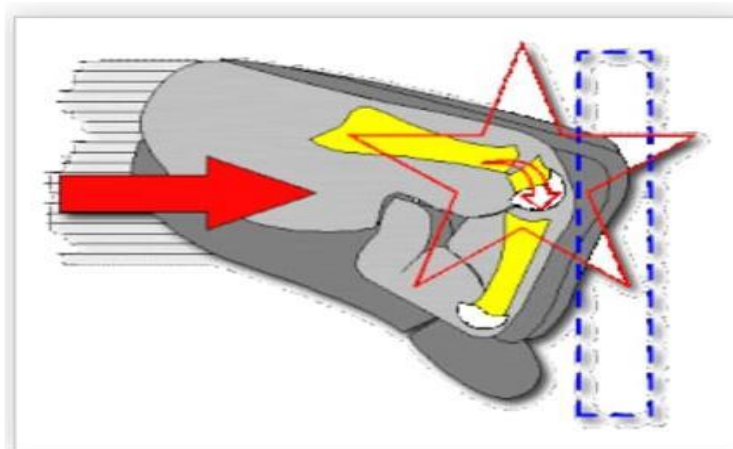
- Among all metacarpal fracture, fracture of 5th metacarpal neck is commonest.
- Also known as scrappers fracture, bar room fracture, street fighters fracture.

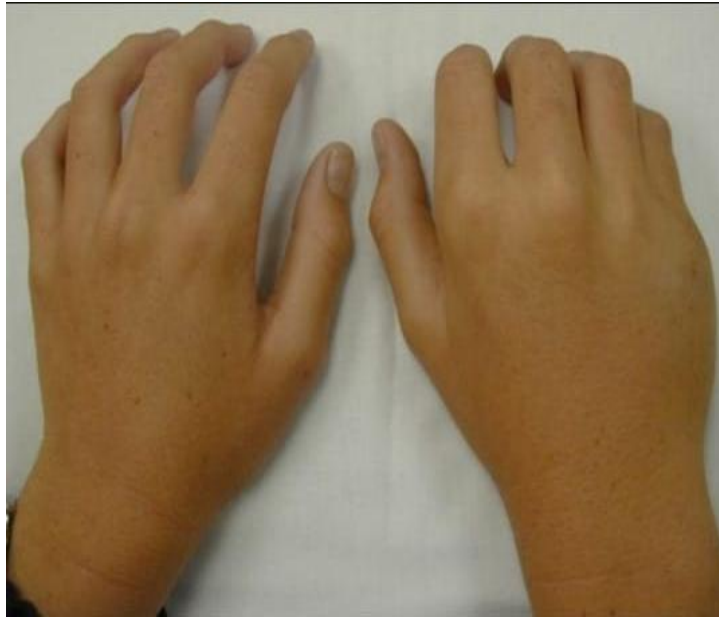
Pathomechanics

Impact of clinch fist to an hard object like skull or wall. Punch with improper form ,forces act at an angle towards the palm, Dorsal bent in bone which causes fracture.

Fracture of 4th & 5th metacarpal more common than 2nd and 3rd metacarpal because:

Normally :- Boxers punches with proper form, Knuckles of 2nd & 3rd metacarpal align linearly with articulating radius followed with humerus thus force travel across joints without injury.





Emergency Management

1. Rest
2. Ice pack
3. Sling
4. Elevation

❖ Material & Methods:-

- 20 patients of fracture of 5th metacarpal were studied in Department of Orthopaedics , Krishna Institute of Medical Science Karad, Satara from July 2017 to July 2019.
- 10 were treated with antegrade k wire and 10 were treated conservatively
- Children younger than 15 yrs were excluded
- Articular fracture were exclude.

- **METHOD**



Antegrade k wire in boxers fracture

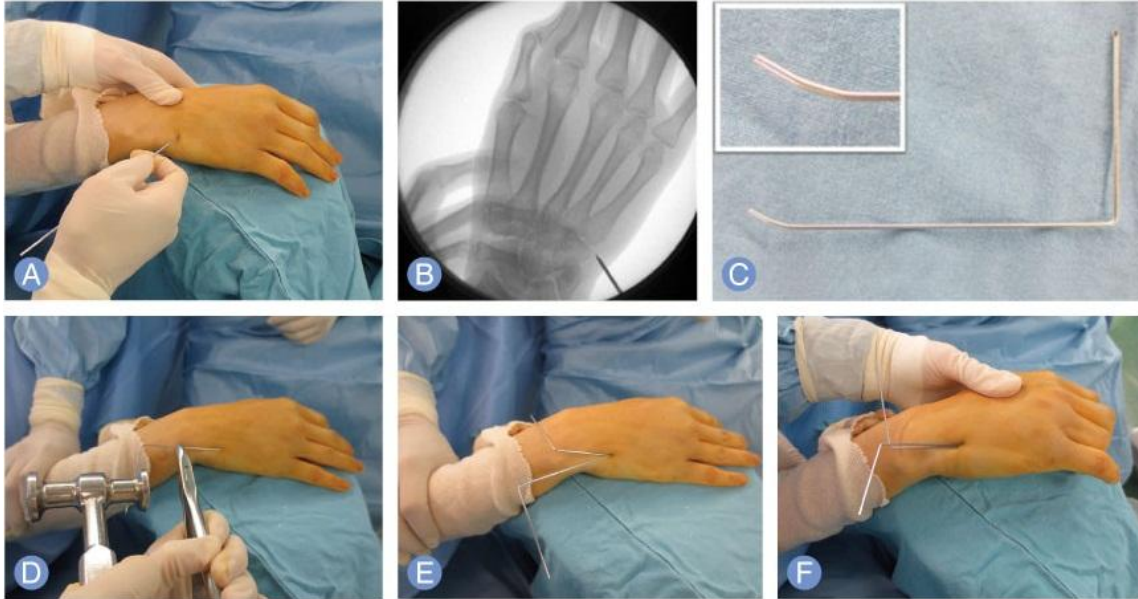
- For 5th metacarpal, entry point of k wire or awl or drill is dorsoulnar at metacarpal base without damaging the carpo-metacarpal joints & respecting the insertion of extensor carpi ulnaris tendon.



EXTENSOR CARPIULNARIS TENDON

- Care must be taken that the protruding end of K wire or bone awl or drill does not interfere with the gliding extensor tendon.

- Pre bending of K wire
- Distal tip of K wire is bent to about 20° about 2 cm from there the wire is bent to about 10°



- Fixation using 2 K wire gives 2 point fixation thus increasing the stability & prevent back out of K wire from proximal end.



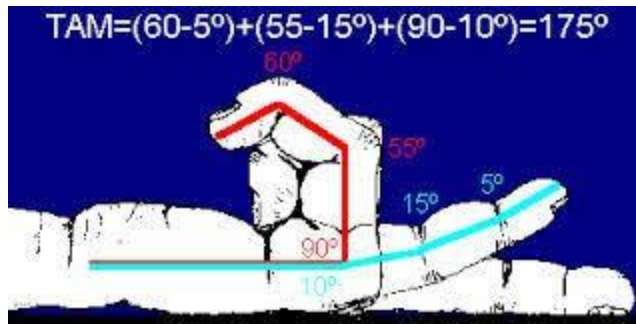
Conservative treatment included splinting as follows: mild wrist extension, 70 to 90 degrees of flexion at MCP joint, and slight flexion at the DIP and PIP joints. Flexion of these joints is important to prevent shortening of the collateral ligaments and subsequent loss of range of motion and functional impairment.



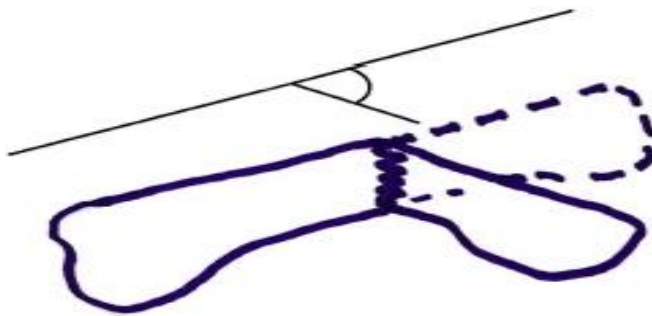
- **Follow up**

Post operative the patient were assessed at 4th week, 6th week, 8th week and 12th week

- At every follow up TAM (Total Active Movement) was noted at metacarpophalangeal joint & interphalangeal joint.
- Total active movement = total active flexion – total extension deficit.
- TAM=total active flexion(metacarpophalangeal joint + proximal interphalangeal joint + distal interphalangeal joint)-total extension deficit(metacarpophalangeal joint+ proximal interphalangeal joint+distal interphalangeal joint).



CALCULATION OF NECK SHAFT ANGLE



- Rotation deformity was noted at neck shaft angle preoperatively & postoperatively percentage of angular correction was assessed and was compared with conservative treatment

❖ RESULT

Demography

| | |
|-----------------|----------|
| Mean Age | 32 ± 2.2 |
| Sex Male/Female | 6:1 |
| Right/Left | 16/4 |

TREATMENT USING ANTEGRADE K-WIRE

| Pt No. | TAM of affected hand on last follow up | TAM of unaffected hand on last follow up | % of improvement | Preop neck shaft angle | Post of neck shaft angle |
|---------------|---|---|-------------------------|-------------------------------|---------------------------------|
| 1 | 270 | 275 | 98 | 65 | 25 |
| 2 | 255 | 260 | 98 | 60 | 18 |
| 3 | 300 | 305 | 98 | 68 | 16 |
| 4 | 290 | 290 | 100 | 70 | 20 |
| 5 | 278 | 282 | 98 | 55 | 16 |
| 6 | 295 | 300 | 98 | 52 | 22 |
| 7 | 278 | 282 | 98 | 64 | 20 |
| 8 | 270 | 275 | 98 | 58 | 24 |
| 9 | 260 | 265 | 98 | 65 | 15 |
| 10 | 300 | 305 | 98 | 60 | 20 |
| MEAN | 279 | 283 | 98 | 61 | 19 |

- The mean TAM of affected hand on last follow up was recorded and was compared with unaffected hand, percentage of improvement was compared with percentage of improvement of TAM in conservative management with respect to neck shaft angle

CONSERVATIVE MANAGMENT

| PT no | Tam of affected hand on last follow up | Tam of un-affected hand on last follow up | Percentage of improvement | Neck shaft angle | Neck shaft angle at end of 3 months |
|--------------|---|--|----------------------------------|-------------------------|--|
| 1 | 252 | 280 | 90 | 64 | 55 |
| 2 | 262 | 282 | 93 | 65 | 49 |
| 3 | 268 | 280 | 96 | 30 | 25 |
| 4 | 282 | 300 | 94 | 45 | 35 |
| 5 | 266 | 280 | 95 | 35 | 25 |
| 6 | 276 | 282 | 98 | 35 | 20 |
| 7 | 268 | 280 | 96 | 35 | 20 |
| 8 | 255 | 300 | 85 | 64 | 50 |
| 9 | 285 | 300 | 95 | 30 | 24 |
| 10 | 280 | 286 | 98 | 32 | 18 |
| MEAN | 269 | 287 | 94 | 43 | 32 |

- We found that at last follow up (3rd month) there was no significant difference in TAM (Total Active Movement) of affected and unaffected hand in patients treated with antegrade k wire technique.
- Conservative management was associated with shortning and malrotation.
- We also found out that person having neck shaft angle more than 45 degrees shows better result when treated with antigrade k wire.
- People having neck shaft bangle less than 30 degrees can be treated conservatively.

❖ Discussion

- Neck Shaft angle more than 45° produces significant muscle restriction that can limit movements of 5th digit but a fracture angle of 30° is compatible with normal function.
- Displacement of head in direction of flexion tends to heel poorly as a result of deforming forces of intrinsic muscles.
- Surgery is indicated when there is clinical malrotation of 5th finger & shortening.

❖ Conclusion :-

- Boxers Fracture are common type fracture in young adults. Conservative management can cause shorting and angular deformities and decrease in hand grip.
- Antegrade prebent K wire help in angular correction and gives better result when compared with conservative management especially in patients having clinical malrotation and shortning.
- Use of two K-wires helps in good fixation and stability to fracture site.

Keywords

- TAM-total active movement
- DIP-distal interphalyngeal joint
- PIP- proximal interphangeal joint
- MCP-metacarpo phalyngeal joint

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