Comparison of different mechanism plate fixation for the distal ulna fractures with concomitant the distal radius fractures

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Purpose

To compare different mechanism plate fixation for the distal ulna fractures (DUF) with concomitant the distal radius fractures (DRF).

Patients&Methods

- unstable DRF & DUF 23 cases (female 19 male4)(2008~16)
- Age  66.9 y.o.(ave.)  (range:52–86y.o.)
- Follow up 14.4 mo. (ave.)  (range:9–20m)
- Stellar hook plate (HOYA) 11 (2008~11) (HP)
- Aptus 2.5 DUP (Medartis) 12 (2013~16) (PLP)

Assessments

- Radiographic assessments
  - radial inclination (RI)
  - ulnar variance (UV)
  - palmar tilt (PT)
- Range of Motion
- Clinical assessment (Mayo wrist score)
  - Mann-Whitney U-test  (P<0.05 )

Results

X-ray Assessments

Radial Inclination

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<tr>
<th></th>
<th>HP</th>
<th>DUP</th>
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<tr>
<td>63.4 y.o. (24~77)</td>
<td>70.4 y.o. (52~86)</td>
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<tr>
<td>F9 M2</td>
<td>F10 M2</td>
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<td>15.8 M ( 8–27)</td>
<td>13.9 M ( 8–20)</td>
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Ulnar Variance

R : AO A3 C1 C2 C3 4
U : Biyani T1 T3 T6 T4 2

Palmar Tilt

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Range of motion

Dorsi-palmar flex.

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Pron.- sup.

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Clinical assesment

Mayo wrist score

HP  89.1  PLP 88.1 (ave.) (Last visit)

Case presentation

43 y.o. / male

Operation

Bicycle accident

Radius : AO C2.2
Ulna : Biyani type3

Last visit

R21 (22)  PT 10

DUF associated DRFx

- 6% in all DRFx (Biyani et al, 1995)
- Conservative treatment in the past
  - small distal fragments
  - poor bone quality and severe comminution of ulnar head
  - Increase of report of surgical treatment recently

Ulnar head is center of rotation of DRUJ

Displacement of ulnar head leads to limitation of Sup.-pro. and change of DRUJ stability

Internal fixation is better for early recovery of function

Purpose of ORIF for DUF

Maintenance of DRUJ congruency

Avoiding from shortening of ulna

Avoiding from DRUJ incongruency by tilting or separating ulnar head

The features&problems of HP&PLP

HP
- Angular stability leads to subchondral support
  - Low profile (1.5mm thickness)
  - Weakness of pullout by braid for distal fragments

PLP
- Angular flexibility&stability of locking screw
  - Anatomical and low profile (1.6mm thickness)
  - Screw fixation for for distal intra-articular fragments
  - Weakness of angular stability of locking plate

Conclusion

✓ Compare the clinical results between hook plate and polyaxial locking plate fixation for DUF associated DRF.
✓ No static difference between the two plate fixations.
✓ Both plates also are useful for fixation of DUF for maintenance of longitudinal length of ulna.
✓ Surgeons should understand the features of the plates for choice