Treatment of humeral condylar fractures in the elderly with locking plates

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Introduction
Humeral condylar fractures are one of the most challenging fractures to treat:
• The bone is thin at the epicondylar level and has a small contact area
• High rotational torque on the epicondyles by the forearm muscles
• Inadequate fixation in the elderly due to poor bone quality and reduced regenerative ability of the bone

Restoration of painless and satisfactory elbow function
• Anatomic reconstruction of the articular surface
• Restoration of the overall geometry of the distal humerus
• Stable fixation of the fracture fragments for early rehabilitation

Results
• Bone union: 43/45 cases (95.3%)
• Non-union: 2 cases (both type A2)
  • 1 case: revision ORIF
  • 1 case: TEA
• Mean flexion: 121.7° ± 12.2°
• Mean extension: 16.5° ± 10.5°
• Mean MEPS: 91.1 points

Complications
• Ulnar nerve palsy: 1 case (2.2%)
• Transient radial nerve palsy: 1 case (2.2%)
• Heterotopic ossification: 1 case (2.2%)
• Condylar nonunion: 1 case (2.2%)
• Loss of correction: 2 cases (4.4%) (1)

Discussion
Failure of anatomical reduction ⇒ osteoarthritis
Failure of rigid fixation ⇒ non-union
Unable to start early rehabilitation ⇒ stiff elbow

Problems with type A fractures:
• 2 cases of non-union were both type A2
• Possible reasons:
  • Thin screws
  • Suboptimal number of screws
  • Poor interdigitation of the screws

Problems with type C fractures:
• Bone union achieved in all the cases but...
• Outcome was: C1 > C2 > C3
• Poor outcome of type C was associated with postop. osteoarthritis
• Anatomical restoration of the joint surface is essential

Principles of MAYO Elbow Plate system:
Every screw should:
• Pass through a plate
• Engage a fragment on the opposite side
• Be as many as possible
• Engage as many articular fragments as possible
• Lock together by interdigitation

The plates should:
• Be applied such that compression is achieved at the supracondylar level for both columns
• Be strong enough to resist breaking or bending before bone union

Even more challenging cases:
• Severe comminution of the articular surface in the elderly
• Very poor bone density and quality
• Limitation of locking plates?
• Decision must be made regarding the whole background of the patients
• Alternative treatments such as TEA

Conclusions
We investigated on the distal humeral fractures of patients over the age of 65, treated with locking plates at our hospital and the affiliated hospitals.
• Bone union was achieved in 95.3% of the patients
• Good outcomes were achieved even in the elderly
• The two cases of non-union were of type A2, due to loss of fixation influenced by the thickness, the number and the lengths of the screws.

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