“When and How to Open Supracondylar Humerus Fractures?”
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Introduction
- Displaced fractures
  - Up to 49% associated neurological injury
  - 3 – 19% associated vascular injury
  - 1% open injuries
  - Malunion results in loss of motion, aesthetic differences
- Standard of care: timely closed reduction and percutaneous pinning

Indications
- Open fractures
- Fractures with vascular insufficiency after attempted closed reduction
- Inadequate alignment after attempted closed reduction

Principles
- Anterior approach for extension-type supracondylar fractures
- Identification and protection of median and/or radial nerves, brachial artery
- Removal of interposed soft tissue
- Anatomic reduction

Surgical Technique
- Supine, hand table, tourniquet rarely needed
- Medially-based, transverse incision over antecubital flexion crease
  - Incorporate traumatic wounds
  - Avoids scar contracture
  - May extend proximal-medially (and distal-laterally)
- Subcutaneous dissection
  - Basilic vein
  - Release lacertus fibrosis
- Identify and retract neurovascular structures
  - Median nerve and brachial artery (nerve medial to artery)
  - Radial nerve (brachialis-brachioradialis interval)
- Identify and debride fracture
  - Periosteum
  - Brachialis
  - Neurovascular structures!
- Anatomic reduction
  - Liberate and sweep soft-tissues off prominent (anteromedial) metaphyseal spike
  - Tactile, visual, fluoroscopic confirmation
- Standard pin fixation
- Simple skin closure
- Vascular insufficiency
  - Extended proximal and distal incisions
Identification of brachial artery beyond zone of injury
Decompression vs. repair vs. vein grafting
Fasciotomies as needed

**Expected Outcomes**
- Adequate exposure and fracture reduction
- Aesthetic scars
- Restoration of function
- Preserved vascularity with appropriate exploration and treatment

**Selected References**
Clark D, Astle L, Monsell F, Livingstone J. The bicipital aponeurosis may be involved in the anatomical etiology of arterial compromise after swelling in supracondylar fracture. J Orthop Trauma. 2009;23:731-3


