

BOAST 11: SUPRACONDYLAR FRACTURES OF THE HUMERUS IN CHILDREN

Background and Justification:

Supracondylar fractures of the distal humerus are the most common fractures about the elbow seen in children. They may be difficult to manage and can be associated with significant complications including nerve injury, vascular compromise, malunion and compartment syndrome.

Inclusions:

Children with a displaced supracondylar fracture of the distal humerus.

Standards for practice audit:

1. A documented assessment of the limb, performed on presentation, must include the status of radial pulse, digital capillary refill time and the individual function of the radial, median (including anterior interosseous) and ulnar nerves.
2. These injuries require early surgical treatment, ideally on the day of admission. However, night-time operating is not necessary unless there are indications for urgent surgery.
3. Indications for urgent surgical treatment include absent radial pulse, clinical signs of impaired perfusion of the hand and digits, and evidence of threatened skin viability.
4. Surgical stabilisation should be with bicortical wire fixation. Crossed wires are associated with a lower risk of loss of fracture reduction, whereas divergent lateral wires reduce the risk of injury to the ulnar nerve.
5. If a medial wire is used, techniques to avoid ulnar nerve injury should be employed and recorded on the operation note.
6. 2mm diameter wires should be used, where possible, to achieve stability.
7. Cubitus varus should be avoided by achieving a carrying angle (or Baumann angle) similar to the contralateral arm.
8. The majority of nerve injuries associated with supracondylar fractures or its surgical management are transient neurapraxias and can be managed expectantly. If there is concern over iatrogenic injury then a thorough assessment with consultant input is required for consideration of nerve exploration.
9. The majority of vascular impairments associated with supracondylar fractures resolve with fracture reduction. A perfused limb does not require brachial artery exploration whether or not the radial pulse is present.
10. In case of children presenting with an ischaemic limb, the case should be discussed with the on-call vascular team in the network prior to operative reduction.
11. If the limb remains ischaemic after open or closed fracture reduction then exploration of the brachial artery is required with a surgeon competent to perform a small vessel vascular repair.
12. Documented post-operative monitoring of neurovascular status should occur until the treating surgeon is confident there is no risk of vascular compromise or compartment syndrome.
13. Suspicion of compartment syndrome or deterioration of perfusion should prompt immediate vascular re-assessment and intervention if required.
14. Post-operative radiographs should be obtained between 4 and 10 days to ensure maintenance of reduction.
15. Wire removal and mobilisation is typically recommended at 3 to 4 weeks.
16. Routine long-term follow up is not usually required.

Evidence base:

Predominantly retrospective case series but with good expert reviews and an evolved professional consensus.