

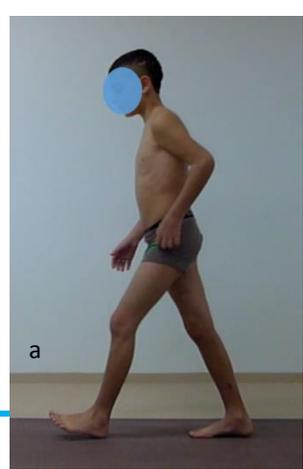


# Traumatic Brain Injury, Heterotopic Ossification and Peripheral Neuropathy in Children

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## Objectives

- Heterotopic ossification is formation of bone where it is neither needed nor wanted
- Ranging from clinical insignificant to devastating effect on quality of life
- Classification –
  - Traumatic
  - Neurogenic
  - Hereditary (fibrodysplasia ossificans progressiva)
- Aim** – evaluate frequency and severity in children with **traumatic brain injury**

## Methods

- Retrospective review - all patients with severe TBI
- Hospitalized at rehabilitation hospital - 2000-2013
- Age at injury 0-16

## Results

- 83 patients fit criteria - 8 cases excluded - incomplete data
- 75 patients included with severe TBI**
- 6/75 – documented heterotopic ossification -**
- 4 – elbow
  - 1 – knee
  - 1 – hip joint
- Follow up – 6.5 years
- Age – 9 (7-14)
  - 4/6 - male
  - GCS at injury ranged 5-8
  - Period of hospitalization ranged 47-827 days
  - Time from injury to HO diagnosis – average 4 months
  - 5/6 – MVA; 1/6 – fall from height
  - 6/6 – **Head trauma, multiple injuries**
  - 2/6 - Fracture in same limb – 1 - proximal humerus, 1 - clavicle
  - 6/6 - **Plegic side**
  - 6/6 - **Spasticity of involved limb**
  - 0/6 - Surgery in same limb
  - 2/6 - Intervention (BOTOX + casting) in same limb

- Discharge GCS - 5/6 - 14-15  
1/6 - 5, deceased after 5 yrs
- 5/6 – Local symptoms improved with NSAIDS treatment
- 2/6 – Significant limb dysfunction – plegia, spasticity, contracture
- 1/6 - Required surgical excision of the HO**



12 year old boy suffered multitrauma after MVA (a, top). Elbow heterotopic ossification with increasing ulnar neuropathy were diagnosed after 4 months (b) and diagnosed with the aid of radiographs (c) and a CT scan (d,e). After excision of the lesion (arrow, f), full elbow range of motion was achieved (g). One and a half years post-op some contracture recurred (h) yet the ulnar neuropathy completely resolved (i).

## Conclusions

- In children with severe TBI, the treatment of HO is usually non-operative with resolution of the HO.
- The effect of this problem is less significant when the limb remains plegic as previously reported in adults.
- Surgical excision of HO may be indicated after maturation of the lesion occurred and when it is clear that limited range of motion is due to this problem and not the CNS injury.
- It is our belief that in cases where nerve symptoms occur in children, early excision of the lesion and release of the compressed nerve is indicated even if the lesion is still deemed immature.