CLOSED REDUCTION OF THE CERVICAL SPINE - PROTOCOL
Singhal Traction Bed

Review full protocol and end points prior to commencing protocol

Stage 1 – Patient positioning and Gardner-Well tong application

1. Complete equipment checklist
2. Patient positioned supine on traction bed with immobilisation collar, head support and shoulder straps secured
3. Hair shaved in 5cm radius from external auditory meatus
4. Pin sites marked as discussed with on call spinal specialist
5. Assemble Gardner-Wells tongs and S hook
    a. Slide S hook onto Gardner-Wells tongs (this may require one pin to be removed)
    b. Pins should start from even positions with lock nut on OUTSIDE of tongs
6. Collar removal and manual maintenance of head position by assistant or towels/sandbags
7. Pin site skin prepped with chlorhexidine and 5-10mL 1-2% lignocaine without adrenaline infiltrated into pin site
    a. 1cm longitudinal skin incision made using 11 blade at marked pin site
8. Tongs held in position by senior clinician, pins evenly tightened symmetrically by assistant.
    a. Pins tensioned using fingers into skull until spring loaded indication protrudes 1 mm above the surface (equivalent 139 Newtons)
    b. Lock nuts are tightened onto outside of tongs using spanner
9. Patient position checked, rope run through pulley and weight spike attached
10. X-ray C-arm positioned and initial X-ray obtained ensuring visualisation of bony abnormality

Stage 2 – Traction application

Analgesia and sedative given as required – patient to remain able to report symptoms

1. Brief neurological examination with focus on prior deficits identified
    a. Subjective report
    b. Distal light touch
    c. Gross finger and toe movement
2. Ensure mast is in neutral/horizontal position, in line with Gardner-Wells hook
3. Attach the wire to the hook
4. **Initial weight:** Wind on 2.5kg using **Load Cell Tensioner Handle**
    a. Lift bed to full height and tilt leg end down fully (note this will apply further weight)
    b. Brief neurological exam
    c. Pin sites checked
    d. Position image intensifier unit and acquire lateral X-ray
5. **Wind Mast Tensioner Handle** to increase traction force in **5kg increments** every 5 -10 minutes
    a. Brief neurological exam and lateral cervical spine X-ray at each increment
    b. As the neck flexes, put towel under pillow to support the neck
    c. Repeat until maximal flexion reached

Once maximum flexion reached, if reduction not achieved, wind the Load Cell Tensioner Handle at 5kg increments every 5 minutes until maximal traction weight reached or other end point Do NOT exceed traction weight passed maximum weight (50% body weight for adults, 25% for children)

END POINTS

Reduction successful

- Return mast to neutral position with Mast Tensioner Handle – this will also reduced traction force
- Obtain lateral XR to confirm reduction in neutral position
    - If re dislocated; repeat reduction protocol
- Extend neck by winding Mast Tensioner Handle below neutral position to slight extension to maintain reduction.
- Reduce traction force to 1kg per level of vertebrae above injury level using Load Cell Tensioner Handle
- Obtain final lateral XR
- Contact OCSS and continue definitive management planning

Tip to tip/locked facet joints

Undertake manual manipulations only if experienced in doing so

- Do not add further traction weight
- Undertake manual manipulations if experienced in doing so
    - Manual traction added to Gardner-Wells tongs on at unreduced facet side
    - Add manual rotating force to manual distraction force, rotating head 40 degrees as tolerated ***towards*** side of dislocation

Maximum traction weight reached without reduction

- Return mast to neutral position with Mast Tensioner Handle
- Obtain lateral XR in neutral position
- Reduce traction to 1kg per level of vertebrae above injury level using Load Cell Tensioner Handle
- Plan for urgent MRI and contact OCSS
- Expedite transfer to operative center or proceed to open decompression
- **Radiological evidence of over distraction**
- Reduce traction weight until over distraction resolved
- Contact OCSS, plan for urgent MRI, proceed to open decompression or expedite transfer

Neurological deterioration

- Reduce traction weight until new neurological deficit resolves
- Contact OCSS, plan for urgent MRI, proceed to open decompression or expedite transfer