

Cervical Disk Disease (Cervical Spine Disease)

Risk

- Incidence in USA: 12,000 deaths/y; 70 million with cervical disk disease, spondylosis, or trauma
- Disk disease a consequence of aging (3rd-5th decades)
- Present in RA, ankylosing spondylitis, and other rheumatic disorders
- Trauma, especially motor vehicle accidents
- M:F ratio: 3:2

Perioperative Risks

- Mortality (acute) 1–5% (depending on associated injuries)
- Spinal cord damage with C-spine movement
- Difficulty intubating or reintubating postextubation
- Swelling or hematoma after neck surgery, which can cause obstruction of airway
- Steroid-induced complications

Worry About

- Airway management; C-spine movement during or after intubation

- Exacerbating or causing spinal cord damage with neck motion
- Osteoarthritis with osteophytes impinging on nerve roots

Overview

- Neck pain: Present in 30% of adults in USA
- Can cause radiculopathy, which can be aggravated by neck extension
- Root:
 - C3: Unusual
 - C4: Numbness rare; pain at root of neck
 - C5: Numb over shoulder to lateral aspect of upper arm (“epaulet” area)
 - C6: Second-most common radiculopathy; pain across top of neck, along biceps muscle into tips of thumb and index finger, as well as biceps muscle weakness
 - C7: Most common herniation, resulting in pain across back of shoulder triceps and into middle finger, as well as loss of triceps reflex
 - C8: Numb small finger; weak interossei

Etiology

- Disk disease is a process of aging.
- Inflammatory arthropathy or trauma; in trauma, can have fractures, dislocations, or ligamentous damage causing spinal cord paralysis; can get swelling of soft tissues of the neck.

Usual Treatment

- Neck should be stabilized, not forced into position; any movement can cause damage.
- In pts with atlantoaxial subluxation, avoid flexion. Pts can have superior migration of the odontoid as well as subaxial subluxation.
- Stabilization and time to heal and repair.
- Shoulder and strap muscle-strengthening exercises.
- Epidural steroids for recent disk disease.
- Steroids for acute spinal cord injury based on local recommendations.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Numbness and pain in RA: Superior migration of odontoid, atlantoaxial subluxation, ADI increased (>4 mm unstable), subaxial subluxation, cricoarytenoid arthritis, airway abnormalities, trauma, swelling	Hoarseness, snoring	In RA: TMJ problems, hypoplastic mandible	In RA: Neck x-ray flexion and extension (measure ADD) Evaluate bones, ligament alignment, soft tissue swelling, motion
CV	Trauma: Possible cardiac contusion/injury spinal shock		Heart sounds distant Unstable BP	EKG, ECHO
RESP	Rheumatologic disorders: Fibrosis, honeycombing Ankylosing spondylitis: Restrictive pattern Trauma: Diaphragm function (C3–C5), pneumothorax, hemothorax, contusion, aspiration, rib fractures	SOB	In trauma: Dyspnea, paradoxical ventilation, flail chest, and breath sounds absent with pneumothorax	CXR and ABG
GI	Ulcers secondary to aspirin for RA			
HEME	RA: Anemia secondary to medications		Trauma: Look for signs of bleeding	Hgb
CNS	Vertebral artery compression: Dizziness, vertigo, nausea, blurred vision			

Key References: MacDonald D: Intraoperative motor evoked potential monitoring: overview and update. *J Clin Monit Comput* 20(5):347–377, 2006; Schwartz D, Sestokas A, Dormans JP, et al: Transcranial electric motor evoked potential monitoring during spine surgery: is it safe? *Spine* 36(13):1046–1049, 2011.

Perioperative Implications

- Assess neck in disk disease, rheumatic diseases, and trauma.
- Consider intubation with neck stabilized by an assistant to avoid flexion or extension or awake fiberoptic intubation.
- Consider intubating with fiberoptic intubation, Glidescope, AirTraq, LMA, light wand, or other airway-assistance device.
- Avoid medications (e.g., midazolam), including muscle relaxants if they are used for initial intubation, that might interfere with specialized spinal cord monitoring, SSEPs, or TCMEPs.

Monitoring

- Acute spinal cord shock may require arterial and PA cath or TEE to facilitate monitoring and treating hemodynamic disturbances.

- When using intraop TCMEPs, protect the tongue and ETT from the masseter and muscles of mastication contraction during stimulation. Remember, muscle relaxants cannot be used with TCMEPs.

Induction

- Consider not initiating irreversible steps (e.g., muscle relaxants) until airway is secured.

Extubation

- Consider not extubating until pt is able to maintain airway without threat of swelling or airway obstruction.

Adjuvants

- Steroids reduce injury in acute traumatic spinal cord injury: use local recommendations.

Postoperative Period

- Observe for neck swelling, hoarseness, and airway obstruction.
- Assess neurologic status.

Anticipated Problems/Concerns

- Anticipate difficulty intubating pts due to abnormal anatomy or limitation of motion. Prepare pt for fiberoptic intubation.
- Associated traumatic injuries including cardiac, brain, lung, abdomen, bladder, and long bones, as well their consequences.
- ARDS from aspiration in a preop traumatic event.
- Injury to tongue or ETT from biting down because of muscle contraction from TCMEP stimulation.

Chagas Disease

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Risk

- 16–18 million people infected worldwide
- Rare in southern USA; chronic disease more likely in immigrants from endemic regions (South America, central Brazil prevalence 6–8%)

- More than 50,000 die each year; mortality estimated at 50% at 4 y secondary to heart failure
- Higher risk to laboratory workers and personnel exposed to blood products, travelers to endemic areas

Perioperative Risks

- Not defined.
- Most important prognostic factor is degree of myocardial dysfunction.
- Esophageal changes due to megaesophagus and reflux.