Preoperative cervical spine X-rays for patients with rheumatoid arthritis

Cervical joint destruction in rheumatoid arthritis may lead to vertebral instability. The incidence of cervical instability is 5–7% (Campbell et al, 1995; Riise et al, 2001), being more severe in those with erosive disease (Oda et al, 1995). The atlanto-axial joint is more prone to subluxation (AAS), most commonly in an anterior direction. Of patients with AAS only 25% have symptoms or signs (Marshall, 2006). Symptoms range from initial neck pain radiating to the occiput to painless sensory loss in the extremities and a slowly progressive quadraperesis. Sudden death may also occur.

Patients with rheumatoid arthritis frequently require anaesthetic input. Concern of cord injury while sedated often leads to a request for cervical spine X-rays as part of the preoperative assessment. The standard 'sniffing' position for laryngoscopy worsens the degree of subluxation (Takenaka et al, 2004). There are no published evidence-based guidelines identifying which patients should have cervical spine X-rays as part of their preoperative assessment, and textbooks of anaesthesia give differing opinions from a mandatory X-ray for all patients to just for those with symptoms suggestive of cervical instability. For the clinician and patient this leads to a lottery approach to the perioperative management of potential cervical spine instability.

Why not X-ray?

There are only two published case reports of spinal cord injury that may have been associated with anaesthesia, laryngoscopy or intubation. Yaszemski and Shepler (1990) describe a patient intubated as part of advanced life support protocol following a cardiac arrest. Inflammatory cells and ischaemic changes were found in the cervical spinal cord at post mortem, suggesting a pre-mortem injury. The patient was completely asymptomatic before the event but did have AAS of 8 mm which was being managed conservatively. It is possible these changes were the result of laryngoscopy and intubation or that spontaneous cord compression may have been the primary event leading to cardiac arrest. The second report (Bollensen et al, 1991) is of a critical care patient post-emergency laparotomy. Following cessation of sedation quadriplegia with respiratory insufficiency was noted. Neurophysiological and X-ray examination confirmed cord compression secondary to odontoid dislocation.

Neurological symptoms are not always dependant on the degree of subluxation. A cohort study by Weissman et al (1982) of 194 patients found 97.4% had radiological evidence of AAS but only 20 had neurological symptoms. Radiographs consume both time and resources, may not alter practice and expose patients to radiation. In a sub-group with greater than average exposure this is an important consideration.

Why X-ray?

A case series (Mikulowski et al, 1975) showed seven out of 11 cases of sudden death were the result of cord compression in patients with no prior symptoms. Tokunaga et al (2006) have shown that a different head position (protrusion position *vs* 'sniffing' position) reduces the degree of anterior subluxation, but worsens any posterior subluxation. Thus there is no standard 'safe' head position.

Weissman et al (1982) conclude that symptomatic cord compression is associated with a subluxation of 9 mm or more (18 of 20 patients with neurological symptoms had >9 mm AAS), less if atlanto-axial impaction is present. Although X-rays are not specific they are sensitive and may prevent adverse outcome perioperatively.

Conclusions

Spinal cord injury in the perioperative period is either under-reported or very uncommon. Studies to date have been small case series or based on radiological examination and case note review. One key question not addressed is how to identify asymptomatic patients at risk preoperatively. Symptoms which should lead to urgent preoperative investigation include a sensation of the head falling forward upon flexion of the cervical spine, changes in levels of consciousness, 'drop' attacks, loss of sphincter control and respiratory dysfunction.

Based on the above evidence, the greater the degree of subluxation the more likely patients are to be symptomatic. Defining a cut-off safe AAS distance is difficult. The authors suggest all patients with symptoms consistent with subluxation and those with severe erosive disease should be X-rayed preoperatively and others should have a formally reported X-ray once a year. The advent of a nationwide computer system should allow easier access to results, reducing wasted time and resources. **BJHM**

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