Airway management in a patient of ankylosing spondylitis with traumatic cervical spine injury

Nilesh Kumar, Ashish Bindra1, Charu Mahajan1, Naveen Yadav
Departments of Anesthesiology and Neuroanesthesiology, Jai Prakash Narain Apex Trauma Centre, All India Institute of Medical Sciences, New Delhi, India

ABSTRACT

Traumatic cervical lesions compressing the spinal cord pose a significant risk of exacerbating the existing neurological condition during tracheal intubation and subsequent positioning. Preexisting ankylosing spondylitis with spinal column involvement renders the spinal column more rigid and introduces difficulty in airway management of the patient with traumatic cervical spinal cord. To improve ease and success, and reduce cervical spine movement, awake fiberoptic intubation (FOI) is considered the gold standard technique for airway management in such cases. Attaining appropriate position for intubation was challenge in this case due to rigid curvature of the ankylosed spinal column. To prevent neurological injury to the spinal cord and preserve spinal cord function, minimizing movement during intubation and attaining appropriate position was of prime concern. Optimal sedation with self-positioning by the patient in a comfortable posture is quite imperative and assures both airway as well as neurological protection in such expected difficult situations. We report the use of dexmedetomidine for self-positioning and awake FOI in a patient with ankylosing spondylitis having traumatic cervical spine who was otherwise neither able to co-operative nor able to give appropriate position for FOI.

Key words: Ankylosing spondylitis, cervico-dorsal trauma, dexmedetomidine, difficult airway

INTRODUCTION

Ankylosing spondylitis is a painful, chronic inflammatory arthropathy, which primarily affects the spine and sacroiliac joints and eventually leads to fusion and rigidity of the spine (bamboo spine). These patients are at greater risk of sustaining cervical spine injury following trauma due to stiffness, kyphosis and osteoporotic bones. Such fractures are commonly located in lower cervical spine and cervico-thoracic junctions.[1] These patients also have higher incidence of perioperative neurological complications.[2] In this case ankylosing spondylitis with cervico-dorsal injury with cord compromise complicated the intubating conditions. Often such patients are in quite discomfort with such severe pain that they are even unable to lie down supine. While it is hard to accuse intubation as a sole donor to spinal cord injury, but one should not underscore the need to exert caution while intubating these patients. Though, awake fibroptic intubation (FOI) is the gold standard technique for airway management of such patients with a stiff spine but achieving appropriate position in a spondylotic spine is a challenge. Awake self-positioning in a patient with ankylosing spondylitis with a critically located cervical lesion is a bonus as well as an obligation. We hereby report airway management of a spondylotic patient who sustained cervico-dorsal spine injury with cord compromise.

CASE REPORT

A 50-year-old male presented with suspected cervical spine injury after road traffic accident. Noncontrast computed tomography cervical spine revealed fracture of C7-D1 vertebrae [Figure 1]. Cervical spine was fused and suggestive of ankylosing spondylitis. Pelvic X-ray showed bilateral total hip replacement. There was no other associated injury. Patient also gave history of ankylosing spondylitis for which bilateral total hip replacement was done 19 years back, and revision total hip replacement was done on the left side 5 years back.
Before accident, patient was able to do his normal routine activities without much restriction but there was a history of discomfort in changing posture from supine to the lateral position at night. On examination, there was restricted movement in all four limbs with intact sensation in bilateral lower limbs. Patient was unable to lie down in the supine position due to severe pain in the neck. He was lying in left lateral position with support of pillows, and even slightest movement was causing great discomfort [Figure 2].

He was planned for instrumentation and posterior fixation of cervico-dorsal spine. In the preoperative visit, patient was conscious, oriented, with normal systemic examination. Oxygen saturation on room air was 98%. Airway examination showed mouth opening of 4 cm with Mallampati grade 3 and cervical collar in situ. Other investigations like hemogram, liver function test, renal function test and electrocardiogram were unremarkable. Patient was explained about awake FOI. Intramuscular glycopyrolate 0.2 mg was given as a premedication. In operation room, all standard monitors were attached. Patient was asked to position himself in a comfortable posture. Two pillows were kept under head to accommodate acute curvilinear posture of the spine but despite all attempts he remained in left lateral position. Two 16 g cannulae were in place. Patient was nebulized with 2% xylocaine for 10 min followed by gargles with 10% xylocaine viscous. Injection midazolam 1 mg and fentanyl 50 µg was given intravenously. Supplemental oxygen was administered through nasal cannula. Anatomical landmarks were not well-defined, and we were able to give right superior laryngeal nerve block only in this position. Transtracheal injection with 4 ml of 2% xylocaine was given. Bite block was placed, and fiberoptic bronchoscopy was attempted in the same position, but was unsuccessful. Patient was unable to cooperate as any body movement was associated with severe pain and apprehension. Patient was started on dexmedetomidine infusion, with 1 µg/kg induction dose over 10 min followed by infusion of 0.5 µg/kg. Patient became quiet and comfortable and helped us to position himself in a semi-supine posture with support of pillows. This semi-supine position so attained was helpful for bronchoscopy and also ensured secured spine with a cervical collar in place. Fiberoptic bronchoscopy was attempted again and was accomplished with ease in this position. An 8.0 mm internal diameter portex endotracheal tube was placed. Thereafter intravenous induction was done with intravenous propofol and rocuronium. All pressure points were padded. Anesthesia was maintained with O₂:N₂O (40:60) in isoflurane. Boluses of fentanyl and vecuronium were given intermittently. Subsequently surgery went uneventfully in the prone position. Patient was shifted to Intensive Care Unit for postoperative ventilation where he was extubated on postoperative day 3. There was no new neurological deficit. His further stay in hospital was uneventful.

**DISCUSSION**

Traumatic cervico-dorsal spine injury in a patient with ankylosing spondylitis poses a great challenge to the anesthetist. The entire anesthetic management of this patient was quite alarming for many reasons. Patient had a history of long-standing ankylosing spondylitis due to which he had already undergone hip replacement twice. Such patients are at increased risk for the posture deterioration and iatrogenic fractures of the spine with worsening of neurological outcome during the surgical procedure, especially while under sedation and anesthesia.[2] Trauma to his cervical spine and its fixation in the prone position further complicated the management. For airway management, awake FOI was the safest bet.[3]

As this patient had a difficult airway and was likely to be ventilated in the postoperative period, we preferred oral
route. Orotracheal tubes are preferred over the nasotracheal tubes as the latter are associated with greater chances of sinusitis.[³] Our routine protocol is to use orotracheal route, and we are more comfortable with it especially in neurotrauma settings. For awake FOI, patient comfort and optimal intubating conditions both are of paramount importance. The main challenge is to provide adequate sedation while maintaining a patent airway and ensuring ventilation.[³] While it is hard to accuse intubation as a sole donor to spinal cord injury in such cases but one should not underscore the need to exert caution while intubating these patients.[³] In our case, the patient was in severe pain, lying in left lateral position and was unable to lie supine. He was supported with pillows for comfort, airway blocks were done with great difficulty in the lateral position due to distorted anatomy and difficult access. We decided to do awake FOI in the lateral position itself, but it was very uncomfortable for the patient and difficult for the performer [Figure 2]. Then the patient was started on dexmedetomidine infusion to provide sedation and analgesia. Dexmedetomidine is a selective α-2 adrenergic agonist which has sedative, analgesic, sympatholytic, anxiolytic and antisialagogue properties.[⁷,⁸] It causes minimal respiratory depression in its clinical doses. The fact that patients are sedated but maintain spontaneous respiration on dexmedetomidine while attempts are made to secure their airway while being awake and co-operative makes it an ideal agent for use in such cases. Electrophysiological monitoring techniques may help early detection of neurological deficit intraoperatively but rare availability and feasibility of such techniques at intubation limits its benefits. Awake self-positioning is the best method for such scenarios.[⁸] After starting dexmedetomidine infusion, patient became quite comfortable and was able to position himself in semi-supine position. This technique may extend the opportunity of continuous neurological monitoring in patients with a risk of position-related cervical injury, especially in the absence of electrophysiological monitoring. FOI was then successfully performed, and the patient was easily intubated.

**CONCLUSION**

Our case demonstrates that awake FOI under dexmedetomidine facilitates self-positioning and helps to secure airway in patients with traumatic spinal injury with preexisting ankylosing spondylitis. Dexmedetomidine can be used as an adjunct to nerve blocks or topical anesthesia. It enhances patient comfort and performer’s convenience without hampering spontaneous respiration and additional risk of neurological deterioration.

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