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CASE REPORTS

Difficult airway with difficult regional anaesthesia for lower limb orthopaedic surgeries in patients with ankylosing spondylitis- What should we opt for?

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A difficult airway in an ankylosing spondylitis patient may be a nightmare for an anaesthesiologist. We report a case of a 60-year-old man who was scheduled for open reduction and internal fixation of left femur shaft fracture. He was diagnosed with ankylosing spondylitis with multiple extra-spinal joint involvements. He had hypertension and COPD with a history of exposures to general anesthesia twice in the past 15 years. He was a chronic tobacco chewer and had a difficult airway. He was managed successfully with a paramedian approach of spinal anaesthesia.

Ankylosing spondylitis is an inflammatory arthropathy of insidious onset. The pathological process is one of infiltration of granulation tissue into bony insertions of ligaments and joint capsules. It further progresses to fibrosis, ossification and ankylosis[1]. It is a systemic disorder and a proportion of patients may develop non-articular manifestations of the inflammatory process[2]. Clinical diagnosis with supportive diagnostic investigations is the hallmark of this disease and the clinical features include backache, stiffness with spinal cord compression or altanto-axial subluxation of cervical spine.

The disease per se is a challenge for the anaesthesiologists. Airway management, central venous access, positioning, neuraxial monitoring and management of massive blood loss all may prove to be difficult in these patients[3]. Patients with ankylosing spondylitis may require surgery for the complications of the disease process itself or any other incidental surgical procedure.

Repair of inguinal hernia, hip surgery, lumbar or cervical osteotomy, cardiac, vocal cord surgery, joint replacement surgeries and temporomandibular surgeries in previously diagnosed cases of ankylosing spondylitis have been reported[4, 5]. Peripheral arthritis develops in at least 50% of patients and may be a presenting feature in 15% of cases[6]. In 25% of patients with peripheral joint involvement the arthritis becomes chronic and the commonly involved joints are hip (75% bilateral), followed by shoulder[7]. Spinal and extradural anaesthesia are usually technically difficult and tracheal intubation may be difficult due to involvement of the cervical spine or temporo- mandibular joints[8].

The present case report highlights the problems faced by the anaesthesiologist related to positioning, airway and central neuraxial block.

Case Report

A 60-year old male presented to orthopaedic emergency department with a history of trivial trauma over left thigh with severe pain and

tenderness for the last 7 days. Periprosthetic fracture shaft of left femur was diagnosed by orthopedic surgeons and the patient was scheduled for open reduction and internal fixation of left femur shaft fracture.

He had a history of left leg surgery 18 years back under general anaesthesia. During that period he was diagnosed as having ankylosing spondylitis with multiple extra-spinal joint involvement and history of chronic obstructive pulmonary disease and hypertension. He was treated symptomatically with non-steroidal anti-inflammatory drugs and steroids, intermittently. He was receiving antihypertensives, steroids and bronchodilators for last eight months regularly. The patient had also undergone bilateral total hip replacement 6 years back under general anaesthesia after which he developed 30°fixed flexion deformity at bilateral hip joints. A 20° fixed flexion deformity was present at bilateral knee joints with abnormal rotation present at medial one-third of left thigh.

On routine preanaesthetic check-up, a detailed history revealed that patient chewed tobacco and smoked cigarettes for the last 25 years. His oral hygiene was very poor. On assessment of the airway he had no neck extension. Neck flexion was only 10° and side to side movements were not possible. Due to bilateral temporomandibular ankylosis, the patient's mouth opening was only 1½ fingers with a modified Mallampati grade IV score (fig. 1). The respiratory system revealed bilateral occasional basal crepitations on examination and X-ray chest showed features of chronic obstructive pulmonary disease (fig. 3).

The patient was on regular tablet Amlodipine (5 mg) once daily. All other investigations were within normal limits including coagulation profile. There was significant disability as the patient was unable to stand, sit properly or turn in either lateral position. Anteroposterior and lateral radiographs of lumbar spines revealed extensive ossification and ankylosis. The two previous operations (at 42 years and 54 years) had been done under general anaesthesia because of failure in the regional anaesthetic technique.

In the operation theatre standard monitoring was established. i.e continuous ECG, non-invasive blood pressure and peripheral oxygen saturation. After insertion of an 18G intravenous cannula, preloading was carried out with one unit of Ringer lactate solution. Since the patient had a difficult airway intrathecal anaesthesia was planned. The difficult airway cart comprising of all necessary equipment for emergency use including fiberoptic bronchoscope system and a percutaneous tracheostomy set were kept ready. As the patient was not able to sit properly and turn to either lateral positions, he was supported by two persons and made to sit at an angle he could comfortably tolerate (fig. 2) (Table-Back angle 60°).

A 23 G Quincke Babcock spinal needle was inserted between lumbar 3-4 intervertebral space via midline approach by an experienced anaesthesiologist. After one unsuccessful attempt with median approach and keeping in view of the history of failed attempts in earlier operations, immediately the approach was changed to paramedian. After insertion of approximately 5.0 cm of spinal needle, free flow of cerebrospinal fluid was obtained and 2.5 ml of heavy bupivacaine (0.5%) was administered. Immediately the patient was kept in supine position and a table tilt of 30° was given (towards operating leg). Continuous oxygen at 4 L/min was started through oxygen face mask. Theatre table tilt was reversed and the block was assessed with pin-prick method. The level of block was controlled with position of table till the sensory blockade reached T9 and thereafter operation table was tilted to a 30° head-up. The patient was sedated with 2 mg midazolam intravenously. The total duration of operation was 120 minutes and the patient recovered without any complications. Postoperative pain relief was provided using injection diclofenac sodium (slow intravenous infusion x 8hourly) as per unit policy for initial 48 hours followed by oral paracetamol (625 mg four times a day) for next 3 days. The patient was followed up postoperatively and no complications were observed.

Discussion

Ankylosing spondylitis (AS) is a self limiting disease with unknown etiology. It is an inflammatory arthropathy of insidious onset. The pathological process is one of infiltration of granulation tissue into the bony insertions of

ligaments and joint capsules. Progression to fibrosis, ossification and ankylosis is variable[8]. The disease affects mainly sacroiliac joints and spine, although 50% of cases can also have extraspinal joint involvement. Majority of people have linked the manifestations of disease with genetic marker HLA-B27 antigen. Breweton found the antigen in 96% of patients with ankylosing spondylitis compared with 4% of controls and in 51% of first degree relatives of patients with disease.[9]

Difficult airway in patients with ankylosing spondylitis has always been a challenge for the anaesthesiologist. Various techniques of intubation like intubating LMA [10] and fiberoptic intubation have been used [8].On the other hand, central neuraxial blockade is considered to be problematic due to ossification of interspinous ligaments and the formation of bony bridges between vertebrae. Fortunately, the possibility of regional anaesthesia need not be excluded and it can be done with minor alterations in approaches or sites of needle insertion. Canakci et al reported successful administration of spinal anaesthesia in a patient with hernia and ankylosing spondylitis[12].
In the case reported we faced the following difficulties.

Airway:
The difficulties encountered in airway were limited mouth opening (1 ½ fingers), Modified Mallampati grade IV, absent neck movements, cervical spine arthritis, absent lower teeth.

Regional Anaesthesia:
Hard lumbosacral spine with narrow intervertebral spaces, difficult positioning of patient due to fixed flexion at hip and knee joints, previous history of failed spinal anaesthesia; and severe pain at fracture site.
Regional anaesthesia was still planned with full preparation for difficult airway management although literature shows variable results of success when regional anaesthesia was administered. Schelew and Vaghadia (1996) conducted a retrospective study on 51 patients with ankylosing spondylitis from 1984-1994 for various surgeries. They concluded that subarachnoid block can be used for perineal or lower limb surgeries[5]. The patient was unable to lie in either lateral position. The patient was held at 60° angle (i.e. back – table angle) and supported by two attendants. An experienced anaesthesiologist performed the procedure and spinal anaesthesia was successful via paramedian approach. Care was taken that drug effect does not reach the higher thoracic region. For this only 2.5 ml (12.5mg) drug volume was used and table tilt was utilized to avoid drug reaching higher level**.** Difficult airway cart was kept ready containing all the required equipment for airway management. Epidural anaesthesia was not considered because of anticipated narrow intervertebral spaces.

Regional anaesthesia is a valuable option if the scope of surgery is appropriate. Majority of studies preferred regional anaesthesia over general anaesthesia[5,11] in patients with diagnosed ankylosing spondylitis whereas Wittman and Ring considered epidural or spinal anaesthesia to be contraindicated because the placement of epidural or spinal needle may be difficult or impossible due to the condition of the interspinous ligaments and bony bridges [7].

In this case we were fortunate to locate the subarachnoid space through the paramedian approach.

To conclude, ankylosing spondylitis is usually associated with a difficult airway and general anaesthesia can always be challenging in these patients. Regional anaesthesia is also expected to be difficult but still subarachnoid block through paramedian approach can always be advocated and recommended as first line anaesthetic technique for lower limb orthopaedic surgeries.

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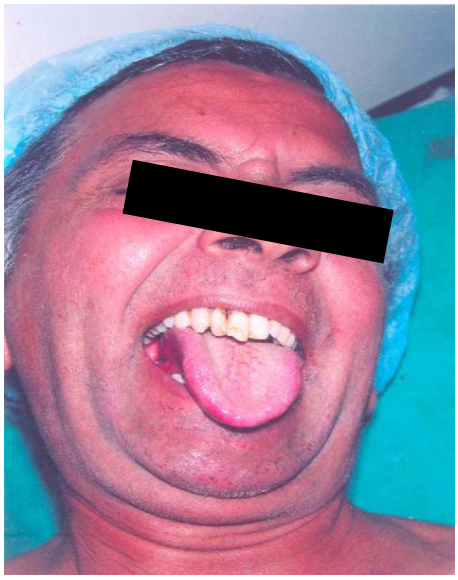

Figure 1: Difficult Airway

Figure 2: Difficult positioning during spinal Anaesthesia

Figure 3:showing thoracic spine X-ray; also shows prominent broncho-vascular markings