

## TEMPOROMANDIBULAR JOINT ANKYLOSIS IN A CASE OF ANKYLOSING SPONDYLITIS – ANAESTHETIC MANAGEMENT

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### SUMMARY

*Temporomandibular joint involvement occurs in a small percentage of patients with ankylosing spondylitis. The anaesthetic management of such a case is discussed.*

**Keywords :** *Ankylosing spondylitis, Temporomandibular joint involvement.*

### Introduction

Ankylosing spondylitis is a chronic inflammatory disease of insidious onset. It affects mainly the axial skeleton, but peripheral joint involvement may also be an important feature. The disorder is postulated to be caused by immunogenetic mechanisms as evidenced by strong association with HLA-B27 and infections with pathogens like Klebsiella (formation of cross reacting antibodies).

The primary pathologic site is the enthesis, or the insertion of tendons or ligament capsules into the bone.<sup>1</sup> Changes due to enthesitis explain the typical findings: syndesmophyte formation, squaring of the vertebral bodies, vertebral end plate destruction and achilles tendinitis.

### Spinal joint disease

The inflammatory process usually begins at the sacroiliac joints and spreads upwards to involve the spine and costovertebral joints (leading to the classical 'bamboo spine'). Limitation of chest expansion to < 2.5 cm is significant. Respiration is normally well maintained by diaphragmatic movement. Cervical spine involvement may range from a limitation of neck movements to complete ankylosis, usually in flexion. These patients have an increased risk of sustaining a cervical fracture after trivial injury. Ossification of interspinous ligaments and formation of syndesmophytes between the vertebrae make the placement of a spinal or epidural needle difficult or impossible in case of lumbar spine involvement.

### Extraspinal joint disease

**Temporomandibular joints:** Limited movement of temporomandibular joints occur in 10% of patients, but if the disease is long standing the incidence may increase to 30-40%.<sup>2</sup> This may progress to complete ankylosis of the joint.

**Cricoarytenoid arthritis:** It is rare and may present as dyspnoea, hoarseness, sore throat and vocal cord fixation. This may make tracheal intubation more difficult.

Extraarticular manifestations<sup>3</sup> include eye (uveitis), cardiovascular system (aortic valve incompetence), central nervous system (spinal cord compression), lungs (fibrosis) and renal (nephropathy).

### Case report

A 28 year old, 55 kg male was posted for release of bilateral temporomandibular joint ankylosis. He was a known case of ankylosing spondylitis since 10 years. He gave a history of initial stiffness in the ankle joints which gradually progressed to the hip joints and the spine. He had difficulty in mouth opening since 4 years and complete inability to open his mouth since 1 year. He also complained of inability to take deep breaths. He had undergone bilateral hip replacement surgery under epidural anesthesia 6 months ago with no post-operative complications. His father and brother were also affected with ankylosing spondylitis. There was no other significant history and no complaints related to the eye, gastrointestinal, cardiovascular or central nervous systems. There was no history of addictions and no history suggestive of obstructive sleep apnea syndrome. The patient was receiving hematinics and cap. indomethacin twice daily.

On examination, mouth opening was 0 mm. Neck movements were severely restricted with only minimal flexion and side to side movement possible and no neck extension. He was unable to flex his back or knees and walked with the help of crutches. His pulse was 96 min<sup>-1</sup>,

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regular, blood pressure was 120/70 mmHg. Heart sounds were normal, there being no murmurs on auscultation. Respiration was predominantly diaphragmatic. His chest expansion at the 4<sup>th</sup> rib was 2 cm. Air entry was bilaterally equal, there were no foreign sounds but the breath holding time was only 15 seconds. When asked to take deep breaths, his accessory muscles of respiration were put to use. Examination of the eye, central nervous and gastrointestinal systems revealed no abnormality.

His preoperative investigations were: Hb of 9.9g%, ESR 65 mm, BUN 7 mg%, serum albumin 2.7 mg%. X-ray cervical spine showed loss of cervical lordosis. Radiographs of dorsolumbar and lumbosacral spine showed presence of anterior and posterior longitudinal ligament calcification with syndesmophytes suggestive of 'bamboo spine'. High resolution CT thorax showed extensive costovertebral ankylosis. No pulmonary or tracheobronchial abnormality was seen.

Pulmonary function tests could not be done since mouth opening was nil. ABG showed pH 7.43, SpO<sub>2</sub> 99, PCo<sub>2</sub> 35, HCo<sub>3</sub> 23.7. Nasal fiberoptic endoscopy revealed a right deviated nasal septum with left inferior turbinate hypertrophy with bilateral spurs.

#### Anesthetic management

We decided to perform a fiberoptic guided awake nasal intubation. Informed consent was obtained for awake intubation and postoperative ventilatory support. Tracheostomy standby and jet ventilation were kept ready.

Patient was premedicated with inj. atropine 0.6 mg I.M. 30 min prior to surgery. An I.V. line was secured and infusion of 5% DNS was started and antibiotic prophylaxis administered. The patient was shifted onto the OT table with great care. 2 drops of xylometazoline were instilled into the more patent right nostril. The upper airway was anesthetized using right nasal packing with freshly prepared adrenalized 4% lignocaine, 2% viscous gargles and bilateral superior laryngeal nerve block with 2 ml of 2% adrenalized lignocaine on each side. Adult size olympus fiberoptic bronchoscope was passed through the right nostril and 8.5 no. portex cuffed endotracheal tube was guided over the bronchoscope into the larynx. The endotracheal position of the tube was further confirmed by capnometry and bilateral chest auscultation.

The patient was then anesthetized with inj. propofol (1%) 2 mgkg<sup>-1</sup> and maintained with N<sub>2</sub>O:O<sub>2</sub>, Halothane and pancuronium bromide. Additionally inj. midazolam 2 mg, inj. pentazocine 30 mg, inj. dexamethasone 8 mg, inj. ranitidine 50 mg, inj. ondansetron 4 mg were given and 100 mg diclofenac rectal suppository inserted.

Intraoperative monitoring included pulse oximetry, continuous ECG, non invasive blood pressure measurement, capnometry and peripheral nerve stimulation, and hourly urine output measurement.

Release of right and left temporomandibular joint ankylosis with interpositional arthroplasty using temporalis muscle flap was done. Total oral opening of 3 cm was achieved. Intraoral coronoidectomy was required on the right side only. Total operating time was 5 hours and blood loss was not significant.

At the end of surgery a direct laryngoscopy was done and only the tip of the epiglottis could be visualized. Residual neuromuscular block was reversed with inj. neostigmine and inj. atropine. Adequacy of reversal was confirmed using double burst stimulation on the peripheral nerve stimulator. We did not have ABG facility, so after confirming that the patient was maintaining normal EtCO<sub>2</sub> and pulse oximetry values, he was extubated on table. Postoperative course was uneventful, he maintained oxygen saturation between 98-100% and was hemodynamically stable. Postoperative PFT was done on day 5 and showed severe restrictive lung disease.

#### Discussion

In a patient with nil or limited mouth opening, intubation choices are blind nasal intubation, retrograde intubation technique via cricothyroid puncture or fiberoptic intubation.<sup>4</sup>

In our patient manipulation of the neck to aid direction of the tube was not possible and if done forcibly could have resulted in a cervical fracture. In addition, repeated unsuccessful attempts could cause soft tissue trauma. Keeping this in mind, we decided to perform a fiberoptic guided intubation rather than a blind nasal intubation. Sedative premedication was withheld till the airway was secured.

Reduction of chest expansion below 5 cm in young persons with insidious onset of low back pain is strongly suggestive of ankylosing spondylitis.<sup>1</sup> Our patient had severe reduction of chest expansion. We therefore anticipated post-operative respiratory problems and obtained consent for ventilatory support.

Since clinical tests to identify the more patent nostril can be erroneous,<sup>5</sup> it is our practice to routinely perform a fiberoptic nasal endoscopy for all patients requiring nasal intubation. Inadvertent intubation of nostrils with septal or other deformities may be associated with an increased risk of complications like mucosal tearing or avulsions of inferior and middle turbinates. Our patient had a more

patent right nostril, so we decided to perform a right nasal intubation.

A variety of techniques for the management of craniomandibular ankylosis<sup>6</sup> have been described. These include gap arthroplasty, interpositional arthroplasty and more recently subankylotic osteotomy with creation of a functional pseudoarthrosis. A coronoidectomy is only performed in cases of long standing ankylosis where passive mouth opening following surgery on the side of ankylosis is inadequate.

### Conclusion

Cervical involvement in ankylosing spondylitis makes tracheal intubation difficult. In addition, the ankylosed neck is more susceptible to hyperextension injury. When a patient with ankylosing spondylitis is posted for release of temporomandibular joint ankylosis, a fiberoptic guided

awake nasal intubation is a safer and better alternative to the classical blind awake nasal intubation technique.

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Ankylosis of the temporomandibular joint (TMJ) is a disabling condition that causes problems in mastication, digestion, speech, function, cosmesis, and maintenance of oral hygiene. It can also cause disturbances of facial growth and acute compromise of the airway, which invariably results in physical and psychological disability. The hypothesis proposed for trauma cases is that intra-articular haematoma, scarring, and the formation of excessive bone gives rise to hypomobility. Ankylosis of the TMJ may be classified using a combination of the site (intra-articular or extra-articular), type of tissue involved (bony, fibrous, or fibro-osseous), and extent of fusion (complete or incomplete). Tripathy et al. have classified ankylosis as true or false. Temporomandibular joint (TMJ) ankylosis is defined as bony or fibrous adhesion of the anatomic joint components accompanied with the mouth opening limitation. However, ef. Citation: Matsumoto A, Sasai T, Matsumoto K (2015) A Temporomandibular Joint Ankylosis with Periarticular Tissue Calcification Long Followed up Case. *J Arthritis* 4:150. doi:10.4172/2167-7921.1000150. Copyright: © 2015 Matsumoto A, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. Visit for more related articles at Journal of Arthritis. View PDF Download PDF Tables & Figures. Abstract. Anaesthetic management of bilateral temporomandibular joint ankylosis with cervical spine fusion for total alloplastic joint replacement in a patient with ankylosing spondylitis. Article (PDF Available) in *Indian journal of anaesthesia* 63(2):76-78 February 2019 with 7 Reads. DOI: 10.4103/ija.IJA\_427\_18. It is not very common to manage a patient with ankylosing spondylitis (AS) and bilateral temporomandibular joint (TMJ) ankylosis with cervical spine fusion to undergo alloplastic joint replacement. However, anaesthetic management of such patients in the context of difficult airway has been described.[1] AS presents challenges to the anaesthesiologist as a consequence of potential difficult airway, cardiovascular, respiratory complications and increased risk of neurological complications.