Case Report

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Anaesthetic Challenges in a Patient with Acoustic Schwannoma: A Case Report Highlighting Complex Airway Management

Anaesthesia Section

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ABSTRACT

The confluence of acoustic schwannoma with Rheumatoid Arthritis (RA) creates unique anaesthesia problems. Acoustic schwannoma surgery necessitates thorough airway and haemodynamic control, whereas RA is linked with systemic co-morbidities-restricted joint mobility, cervical spine instability and possible medication interactions, all of which have a substantial impact on anaesthetic preparation. Hereby, the authors describe the anaesthetic care of a 40-year-old female who had a history of RA and was scheduled for acoustic schwannoma excision. Preoperative testing indicated, swelling in the left eye, vomiting, weight loss and a burning sensation in the oral cavity. These characteristics prompted concerns about airway management, posture and perioperative infection risks. Special precautions were used intraoperatively to ensure stable haemodynamics during posterior fossa surgical placement. Perioperative steroid supplementation and infection prevention measures were used. The procedure was completed successfully and without complications and the patient recovered normally. Anaesthetically, this example demonstrates the intricate relationship between RA and acoustic schwannoma surgery. To reduce perioperative risks, comprehensive preoperative screening, early detection of airway issues, careful intraoperative posture and interdisciplinary planning are were required. An individualised anaesthetic approach is critical for improving patient outcomes in such difficult situations.

Keywords: Difficult airway, Oral submucous fibrosis, Rheumatoid arthritis, Swelling

CASE REPORT

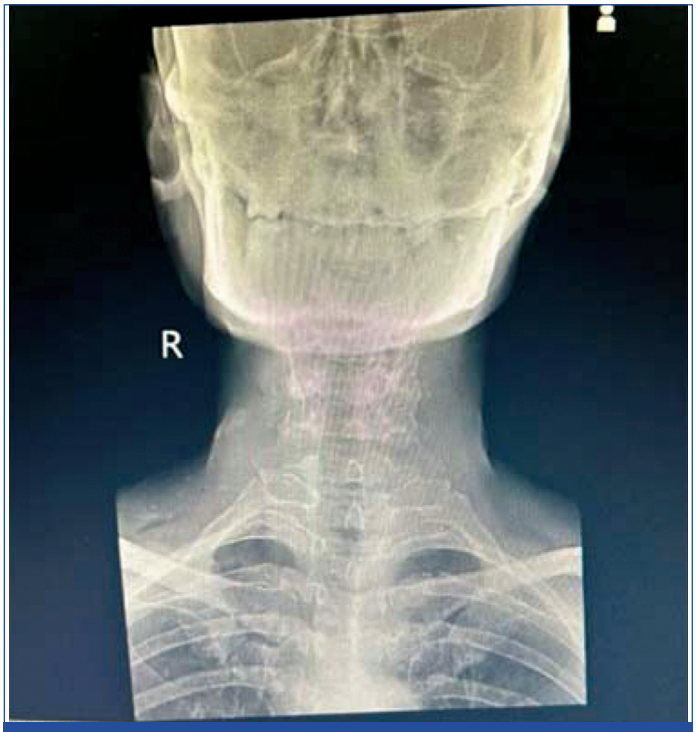
A 40-year-old female weighing 36.3 kg American Society of Anaesthesiology (ASA) II presented with a 1.5-month history of persistent vomiting, progressive weight loss over the past 6 months and a burning sensation in the oral cavity for 1.5 years. Vomiting had increased in frequency over the two days prior to admission (2-3 episodes/day), occurring immediately after meals and containing undigested solid food particles, non projectile in nature. She also reported swelling of the left eye for the past 10-12 days and a 3-year history of joint pain. There was no history of fever, cold, chest pain, breathlessness, or palpitations. The patient was fully conscious and oriented upon arrival to the Emergency Department.

The patient has a history of oral submucous fibrosis (2.5 years), which has been treated, along with mild arthritis and persistent constipation (1 year), was currently on Ayurvedic medicine. Swan neck deformity of the fingers had been present for 2–3 months. A weak cough reflex was noted, along with neck pain. During examination, there was blurring in the right eye. Facial muscle examination showed clenching of teeth, loss of angle of mouth on left-side with puffiness [Table/Fig-1].

There was deviation of tongue to the right-side. Sensation was intact at the pinna of the ear.

Preoperative airway examination indicated a Mallampati grade III airway with restricted neck and Temporomandibular Joint (TMJ) movement, a shorter thyromental distance (5.5 cm) and a small inter-incisor gap (3 fingers), indicating a difficult airway. Preoperative vitals were steady and regular laboratory tests were within acceptable ranges. Cervical spine Magnetic Resonance Imaging (MRI) revealed RA-related atlantoaxial instability, requiring minor neck adjustment. To guarantee safe airway management, challenging airway preparation involved the use of a video laryngoscope, fibreoptic bronchoscope, supraglottic airway devices and emergency airway equipment.

The patient was referred to the Department of Ear, Nose and Throat (ENT) where she underwent audiogram which revealed that she had moderate sensorineural hearing loss in the right ear and severe

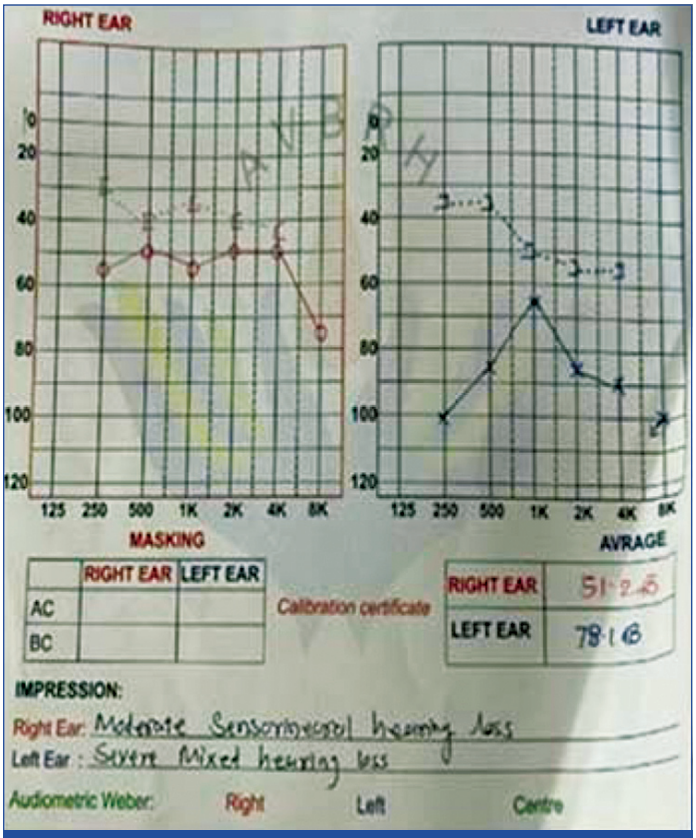


[Table/Fig-1]: Indicates a loss of mouth angle on the left-side, as well as jaw deviation to the left, indicating facial asymmetry. These results are consistent with RA-related musculoskeletal involvement and, in the clinical setting, may be linked with atlantoaxial instability.

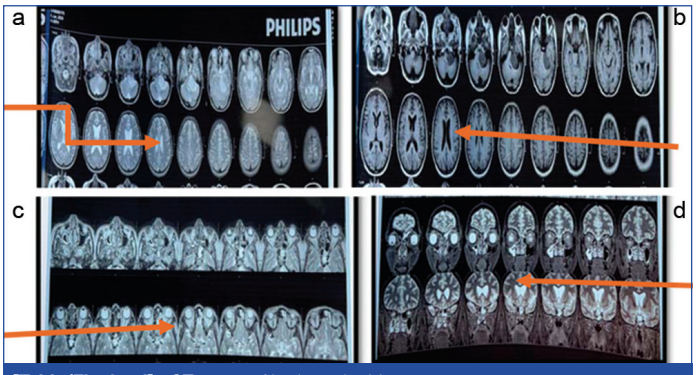
mixed hearing loss in the left ear [Table/Fig-2]. All routine workups were done including 2D echo which showed mild Anterior Mitral Leaflet (AML) prolapse indicating mild cardiac risk. CE-MRI brain revealed a well-defined, heterogeneously increasing changed signal intensity lesion in the left cerebellopontine angle, extending into the internal auditory canal, measuring approximately 4.7×3.6×4.4 cm. The mass has a strong mass impact, squeezing the pons and left cerebellar peduncles, shifting them to the right and generating oedema with partial effacement of the fourth ventricle (albeit no

hydrocephalus is observed). Tonsillar herniation is also reported immediately below the foramen magnum. Raised Intracranial Tension (ICT) is also indicated by a half empty sella, significant Cerebrospinal Fluid (CSF) gaps surrounding the optic nerves and optic nerve kinking. Other features include typical ganglio-capsular and parasellar areas, as well as mucosal thickness in the left frontal, ethmoid, sphenoid and right maxillary sinuses. Overall, these data point to a neoplastic aetiology, most likely Acoustic Schwannoma, with secondary consequences such as increased intracranial pressure and slight tonsillar herniation [Table/Fig-3a].

The MRI orbit revealed features of raised ICT present in the form of partial empty sella, prominent CSF spaces around the optic nerves and optic nerve kinking. Bilaterally presence of papilloedema was noted. In the bilateral eye the disc margins were blurred, elevated with superficial haemorrhage and hard-tissue exudates tortuous vended around the disc [Table/Fig-3b-d].



[Table/Fig-2]: Audiogram of the patient.



[Table/Fig-3a-d]: CT scans of brain and orbit.

The patient was moved to the operating theatre, where all usual ASA monitors were installed. An 18G intravenous cannula was installed and intravenous fluids (normal saline) were administered. Preoxygenation was carried out using 100% oxygen at a rate of 5 L/min. Intravenous 2% lidocaine 60 mg, fentanyl 100 µg and thiopentone 200 mg were used for induction. Dexamethasone, ceftriaxone, tranexamic acid, mannitol, 3% Sodium Chloride (NaCl), sodium bicarbonate and levetiracetam were then administered. Propofol infusion was initiated and bag-mask ventilation was administered. Vecuronium was administered intravenously (0.1 mg/kg) to relax the muscles. The patient was ventilated for three minutes before being intubated with an 8.0-mm endotracheal tube. Bilateral air ingress was verified and the tube was sealed. Intraoperatively, the left radial artery was cannulated for invasive arterial pressure as well as blood gas analysis and a triple-lumen central venous catheter was inserted into the right subclavian vein. The bladder was catheterised to measure urine production. Haemodynamic measures such as Central Venous Pressure (CVP), arterial pressures and peak airway pressures were continually monitored.

The patient was progressively transferred to a sitting posture while maintaining haemodynamic stability. Knees were placed at the level of the heart, shoulders were tied to prevent sagging and over-flexion of the neck was avoided. Pillows were put beneath the thighs and the pressure spots were suitably cushioned. The head was secured with a Mayfield frame, which was bolted to the operating table, immobilising the head and trunk. Before scalp fixation, 1 µg/kg of fentanyl was given. The arterial line transducer was zeroed at the middle ear level to provide precise pressure monitoring. Fentanyl infusion at 1 µg/kg/hr provided intraoperative analgesia, whereas propofol infusion at 0.2 mg/kg/hr and Sevoflurane {Minimum Alveolar Concentration. (MAC) 0.5-0.6%} allowed for facial nerve monitoring. Noradrenaline infusion at 4 mL/hr was started to keep Mean Arterial Pressure (MAP) between 70 and 90 mmHg. All key values stayed constant during the treatment. Serial arterial blood gas monitoring was conducted and no intraoperative problems, like venous air embolism, occurred.

The arterial line was removed after surgery to ensure haemodynamic stability; however, due to concerns about airway oedema, the length of the surgery and the requirement for close neurological observation, the patient was not extubated as well as was transferred intubated to the neurosurgical Intensive Care Unit (ICU) for continued postoperative monitoring along with ventilatory support.

DISCUSSION

The RA is a chronic systemic inflammatory disorder that primarily affects synovial joints but can also affect the cervical spine, Temporomandibular Joint (TMJ), as well as cardiopulmonary systems, posing significant anaesthetic challenges, particularly in airway management as well as positioning [1,2]. Acoustic schwannoma, a benign tumour of the vestibulocochlear nerve, complicates anaesthesia care by necessitating precise airway management, haemodynamic stability and optimum surgical posture during posterior fossa surgery [3]. The confluence of RA and auditory schwannoma is uncommon and poses unique surgical problems, emphasising the significance of thorough preoperative evaluation and interdisciplinary planning [4].

Airway management is a key issue in RA patients due to atlantoaxial instability or subaxial cervical spine instability, TMJ limitation and cricoarytenoid joint involvement, all of which raise the risk of difficult laryngoscopy, neurological damage and post-intubation airway oedema [5,6]. Awake fibreoptic intubation is regarded as the gold standard approach for managing expected problematic airways in RA patients, since it allows for continuous examination of airway patency while preserving spontaneous breathing. When instability is suspected, a targeted airway examination accompanied by cervical spine imaging is required. Awake or minimal-manipulation intubation with smaller endotracheal tubes is indicated, especially when additional limitations such oral submucous fibrosis limit mouth opening, favouring flexible fiberoptic procedures with complete difficult-airway backup [7,8]. It also allows for more precise navigation due to reduced mouth opening, decreased TMJ movement and cricoarytenoid involvement, all of which are typical in RA. Adequate topical anaesthesia and mild sedation improve patient compliance and comfort while preserving protective airway

reflexes, resulting in increased safety and success rates in this high-risk group [5].

The sitting posture was chosen to maximise posterior fossa exposure, promote gravity venous drainage and lower intracranial pressure, hence increasing surgical vision and perhaps reducing blood loss [9]. These advantages were carefully weighed against recognised hazards such venous air embolism, hypotension and cervical spine strain. The benefits of cautious patient selection, progressive placement, invasive haemodynamic monitoring, continuous end-tidal CO_2 surveillance and rapid therapy of venous air embolism were shown to exceed the dangers in this case [10].

The systemic symptoms of RA have a substantial impact on perioperative treatment. Chronic steroid therapy requires evaluation for adrenal suppression and infection risk, whereas disease-modifying antirheumatic medications and biologics required collaboration with rheumatology to balance disease flare as well as wound-healing concerns [11,12]. RA-related pulmonary, cardiac, haematologic and renal dysfunction should be optimised prior to surgery. Postoperative planning needs to account for airway oedema, the likelihood of delayed extubation and the difficulty of re-intubation in a difficult airway, necessitating careful neurosurgical ICU surveillance [13].

The published research on the coexistence of auditory schwannoma and RA is limited; nonetheless, individual studies reveal comparable anaesthetic problems. Patients with RA having neurosurgery typically report challenging airway management because to atlantoaxial instability and limited TMJ mobility, necessitating awake fibreoptic intubation or alternate airway methods [14]. Ansari SF et al. and Carlson ML reported that acoustic schwannoma procedures stress the importance of precise intraoperative placement, haemodynamic stability and continuous neuromonitoring to avoid neurological complications [14,15]. Additionally, study done by Goodman SM et al., showed that immunosuppressive medication in RA increases the risk of perioperative infection and complicates postoperative recovery [16]. These studies highlight the necessity of complete preoperative evaluation, multidisciplinary planning and individualised airway techniques in patients with overlapping problems, such as the instance presented.

CONCLUSION(S)

Anaesthesia treatment of a patient with a large acoustic schwannoma accompanied by RA necessitates precise planning, multidisciplinary cooperation and close intraoperative monitoring. RA-related cervical spine instability and airway constraints demand a thorough preoperative examination and meticulous airway manipulation, whereas posterior fossa surgery adds the issues of brain relaxation, cerebral perfusion management and the necessity for facial nerve monitoring. The sitting posture, while favourable surgically, increases the risk of venous air embolism and haemodynamic instability. The present case emphasised the significance of adapting anaesthetic techniques to individual co-morbidities, prioritising proactive airway planning and maintaining coordinated perioperative care to achieve safe results.

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