CASE REPORT

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A Case Report: Anaesthetic Challenges in Perioperative Management of a Cervical Vagal Schwannoma

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Abstract

Vagal Schwannomas are extremely rare, benign, slow growing tumours. Perioperative management in these cases differs from those of other neck swellings due to its close proximity to vital neurovascular structures. Surgical resection of vagal schwannoma involves various anaesthetic challenges like difficult intubation, intraoperative hypotension, bradycardia, cardiac arrest, torrential bleeding, vocal cord paralysis, possibility of ventilatory support and prolonged post op ICU stay. Here we present a case of a 29 year old male, posted for surgical resection of a benign neck swelling (4.9×3.7×6.3 cm) originating from the vagus nerve. Knowledge about anticipated complications, vigilance in prevention and prompt management of hemodynamic alterations can prevent devastating complications. This case report aims to pen down the course of perioperative management from our experience and from existing literature.

Keywords: Vagal schwannoma; Cervical tumor; Anesthesia; Perioperative management.

INTRODUCTION

Schwannomas are benign encapsulated nerve sheath neoplasms arising from peripheral or cranial nerves. Cervical vagal nerve schwannoma is an extremely rare (2-5%), and slow growing tumor.[1] They are reported to occur in patients between 20 and 50 years of age with no sex-related predisposition. Being a slowly growing lateral neck tumor, these lesions pose a challenge in terms of diagnosis, treatment and post–operative care. Complete surgical excision is the treatment of choice. Apart from sharing the airway with an ENT surgeon, various other anesthetic challenges include difficult intubation, intraoperative hypotension, bradycardia, cardiac arrest, torrential bleeding, vocal cord paralysis, ventilatory support and prolonged post op ICU stay. A large neck tumor in a young patient, arising from the vagus nerve, surrounding major vital structures, to undergo surgical resection with likelihood of post – operative vocal cord paralysis is sure to cause an anesthesiologist's adrenaline rush!!! While we

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usually focus on latest drugs and technologies in managing such cases, not all setups are well equipped with all the advanced facilities. In such situations, knowledge, anticipation, vigilance and precision can help us deal with many complications even with limited resources. Here, we report a case of a young male with asymptomatic vagus nerve Schwannoma posted for surgical resection.

CASE SUMMARY

A 29-year-old, 65 kg male, ASA–I, presented with a progressive, painless, asymptomatic swelling on the right side of the neck for 2 years. On palpation, the mass was measuring 10 × 6 cm extending superiorly from lower end of angle of jaw to the middle of the neck, was firm in consistency, nontender, with the skin over swelling being normal without any change of temperature over the local site. The swelling was not mobile with either deglutition or extension of neck. On indirect laryngoscopy, both vocal cords were mobile. Systemic examination was unremarkable. All blood investigations, X-ray chest and electrocardiogram (ECG) were within normal limits. Contrast-enhanced computed tomography scan revealed a 4.9×3.7×6.3 cm soft tissue lesion in right carotid space. The right IJV was displaced and severely compromised on lateral aspect. Radiological findings were suggestive of neoplastic etiology most probably a schwannoma likely arising from the vagus nerve. (Fig. 1)

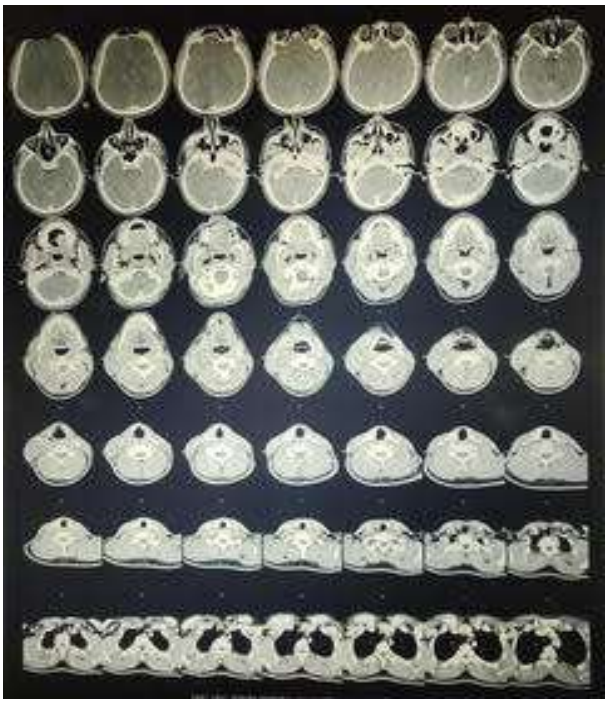

Fig. 1: Extent of tumour

Patient was posted for Schwannoma excision and plastic surgeons were informed in view of possibility of microvascular surgery and nerve repair. Considering the risk of possibility of intra-operative trauma to pharynx, superior laryngeal nerve or carotid artery, written informed consent was taken for possibility of intra-operative bradycardia, severe hypotension, cardiac arrest, excessive blood loss, post operative hoarseness of voice and prolonged ventilator support. In the operating room (OR), all emergency cardiac drugs and defibrillator were kept ready. Standard NPO guidelines were followed, wide bore IV cannula was secured and premedication was done as per routine institutional protocols. Baseline vital parameters were recorded. HR: 80 bpm, BP:132/96 mmHg, respiratory rate: 16/min and SpO_2 (on air): 98%.

Premedication was given in the form of Injection fentanyl 100 µg; Inj. midazolam 1 mg; Inj. glycopyrrolate 0.2 mg IV. Patient was induced with Inj. Propofol 100 mg and Sevoflurane 2% with O_2. Video laryngoscopy was done to visualize and record the movement of vocal cords. (Fig. 2)

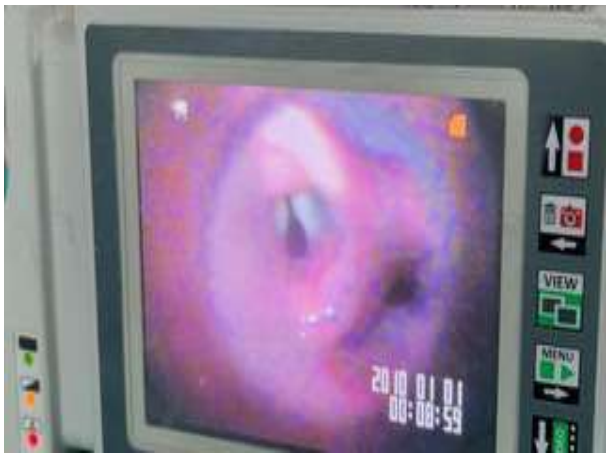

Fig. 2: Bilateral vocal cords on videolaryngoscopy

Muscle relaxation was achieved with Inj. Rocuronium 8 mg and trachea was intubated with 8.0 mm, cuffed, flexometallic endotracheal tube. Anaesthesia was maintained with N_2O:O_2 (60:40), sevoflurane and intermittent doses of Atracurium. Intraoperative monitoring included – ECG, NIBP, SpO_2, $EtCO_2$, temperature and urine output. As the surgery started, initial steps were uneventful, however, with the dissection and manipulation of tumour mass, patient developed sudden bradycardia (HR – 40/min). Surgeons were informed immediately and Inj. Atropine 0.6 mg was given intravenously. The heart rate returned to normal and the surgery proceeded

further. With recurrence of frequent episodes of bradycardia, perineural infiltration was done with Inj. Lignocaine (0.2%) 3ml in a view to prevent vagal stimulation. No fresh episode of bradycardia was noted thereafter. Tumour was dissected very carefully. 15 minutes before extubation, patient was administered Inj. Paracetamol 1gm IV and Inj. Ondansetron 8mg IV. The duration of surgery was 2½ h. Neuromuscular blockade was reversed successfully at the end of surgery. Patient was extubated uneventfully and functioning of both the vocal cords was confirmed.

DISCUSSION

Schwannomas are benign nerve sheath tumors. Approximately 25–45% of the reported extracranial schwannomas are present in the head and neck area. Among the cranial nerves, schwannomas, more frequently arise from glossopharyngeal, accessory and hypoglossal nerves. The involvement of vagus nerve is extremely rare and has been reported in 10% of cases. Surgical excision with or without preoperative embolization is the recommended treatment. The resultant complications include complete unilateral vagal nerve paralysis together with additional glossopharyngeal, hypoglossal nerve, and cervical sympathetic chain disturbances. Also, vagal schwannoma resection almost always requires vagal nerve scarification with resultant speech, swallowing and sensory deficits.[2] Specifically, hoarseness is reported by most patients following schwannoma resection, whereas vocal cord paralysis occurs in 85% of patients after tumour resection. Further common complications of schwannoma resection include pharyngolaryngeal anaesthesia, aspiration and cranial nerve IX, XI and XII palsies, which may be transient or permanent. Finally, other uncommon complications described include Horner's syndrome and permanent/ frequent alteration of heart rate.[3]

Planning of anaesthetic management in these patients requires careful consideration of all possible complications, anticipation and prompt management. Since the patient is usually young and asymptomatic, meticulous counselling for possible perioperative events and a well explained and documented consent holds extreme importance. We chose videolaryngoscopy guided intubation as it does not require extension of neck (thus avoiding traction on the nerve) and for medicolegal documentation.

Anaesthetic management of vagal nerve schwannoma excision is a challenging task. ECG abnormalities and severe bradycardia leading to hypotension have been reported in a few case reports. Mukherjee *et al*. have documented intraoperative cardiac arrest in their patient during excision of a large vagal schwannoma.[4] On literature review we found that compression of vagus nerve by the tumour can reduce the parasympathetic tone and paradoxically increase the sympathetic activity which may lead to tachyarrhythmias.[5] Taking these points into consideration, Anaesthetic drugs known to cause major cardiovascular fluctuations were avoided during anaesthesia induction. Recurrent episodes of bradycardia during tumour resection gave an alarming sign and was very well managed with perineural local anaesthetic infiltration. No further episode of dysrhythmia was experienced thereafter. Intra-operative monitoring of vagus nerve may necessitate avoidance of neuromuscular blockade, though it was not required in this case.[6] Vocal cord paralysis has been reported in 85% of cases postoperatively while hoarseness in almost all cases.[7] Therefore, assessment of vocal cords' mobility during the preoperative and postoperative period holds utmost importance. Our patient did not experience any hoarseness of voice in postoperative period.

LIMITATIONS

Continuous monitoring of Invasive blood pressure and endotracheal intubation using an electromyogram (EMG) tube are usually recommended in management of such cases.

CONCLUSION

Cervical vagal nerve schwannoma is usually an asymptomatic condition but can lead to fatal outcome. Basic interventions based on knowledge and clinical skills can complement the advanced monitoring and pharmacological therapy in such cases leading to successful outcome.

Conflict of Interest: Nil

Funding: Nil

Ethical Considerations: Identity of patient is not disclosed. Necessary consent taken.

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