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Case Report

Carotid body tumour resection using combined general anaesthesia and cervical plexus regional anaesthesia technique: a case report and review of literature

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ABSTRACT

Carotid body tumours are rare benign tumours that originate from neural non-chromaffin cells that are typically localized near bifurcation of carotid artery. Reported incidence of tumor was 1-2 per 100,000. Surgical removal of the tumor is the most definitive treatment. It has a high incidence of perioperative morbidity and mortality We combined general anaesthesia with regional anaesthesia technique for better haemodynamic stability. Basic elements of anaesthetic management are protection of hemodynamic stability and maintaining cerebral perfusion pressure. Few cases have been reported as of now. The aim of this study was to evaluate anaesthetic management of CBT surgery and present the literature knowledge.

Keywords: Carotid body tumour, Cervical plexus, Resection, General anaesthesia, Haemodynamic, Regional anaesthesia

INTRODUCTION

Carotid body tumor is localized on superolateral regions of the throat, posteroinferior part of the corner of the lower jaw, and it can yield symptoms as solid, painless swelling increasingly growing within years Occasionally, these tumours can be discovered incidentally. Their incidence rates have been reported between 0.06, and 3.3:100000, and they are seen more frequently in women when compared with men.[1] They can be seen at any age, however they are observed most frequently between 4 and 5 decade.

CASE REPORT

A 50-year-old female presented swelling on the right side of neck since 1 year, which was insidious in onset, gradually progressive, and painless. There was no history of trauma, fever, or cough. On examination, non-pulsatile mass was seen on the right side of the neck, which was measuring about 3×4 cm, nontender, non-collapsible, and absence of bruit. On general physical examination, the patient was 40 kg, 150 cm in height, pulse rate of 70 /min, and blood pressure of 120/70 mm Hg. The airway assessment showed Mallampati grade I, thyromental distance of 6 cm, and adequate mouth opening. Cardiorespiratory per abdomen and central nervous system examination were within the normal limit.

Preoperative hemogram, random blood sugar, electrocardiogram, electrolytes, renal function tests, and chest radiograph were normal. Special investigations such as Doppler study showed hypervascular lesion at the right carotid bifurcation suggestive of CBT. On magnetic

resonance imaging, large well-defined ovoid intensely enhanced mass over right carotid bifurcation insinuating both internal and external carotid arteries and confirmed the findings of the Doppler study (Figure 1). The patient was diagnosed as having right CBT and planned for excision under general anaesthesia plus cervical plexus block.

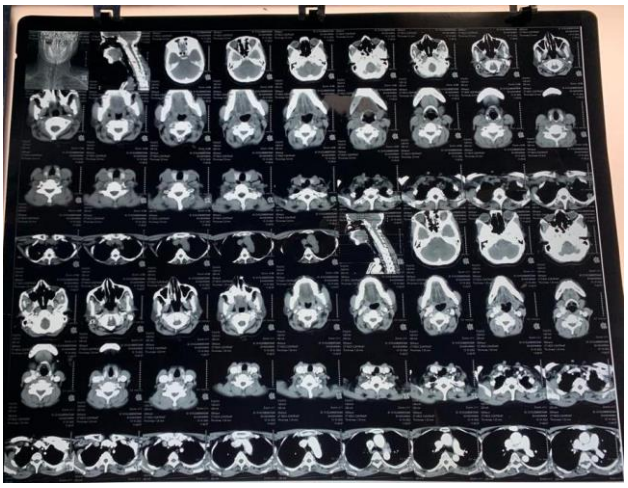

Figure 1: MRI of carotid body tumor.

Figure 2: Cervical plexus block.

The patient was premedicated with tablet alprazolam 0.25 mg and tablet pantoprazole 40 mg per oral night before surgery and on the day of surgery in the morning and was kept nil per oral for 6 h before surgery. A maintenance fluid Ringer lactate was given at the rate of 100 ml/h, throughout surgery through 18 G intravenous cannula. On arrival to the operating room, noninvasive blood pressure (BP) 128/74 mmHg, heart rate of 86 /min, regular, respiratory rate of 14 /min, and oxygen saturation of 99% were recorded. ECG and nasopharyngeal temperature monitoring were established, together with monitoring of invasive BP and central venous pressure (CVP). A left radial artery was cannulated with 20 G under local anesthesia for invasive BP monitoring.

The patient was premedicated with injection midazolam 0.05 mg/kg and injection fentanyl 2 mcg/kg intravenously. Under USG guided superficial and deep cervical plexus block performed using 0.25 mg of 15 ml levobupivacaine (Figure 2). Preoxygenation was done for 3 min and induced with injection propofol 1.5 mg/kg. tracheal intubation was facilitated by injection cisatracurium 0.1 mg/kg. A cuffed Portex oral 7 mm endotracheal tube was passed. Anesthesia was maintained with oxygen and nitrous oxide (1:1), an end-tidal concentration of isoflurane of 0.8, and a minimum alveolar concentration of 1.1 with volume-controlled ventilation. Left subclavian vein was cannulated to monitor CVP. and the infusion rate was adjusted to keep mean blood pressure of 80-90 mm. Since the operation theater temperature was kept at 21 °C, there was a drift in patient temperature to 34-35 °C, which was acceptable during the excision of tumor.

Figure 3: Dissection of carotid body tumor.

Total surgical duration was 2 h and tumor was resected safely, and blood loss was around 300 ml, which was within allowable blood loss in this patient (Figure 3). The vital parameters remained stable throughout the course of surgery. The intravenous fluid was titrated to maintain CVP of 10-12 mm Hg.

Because the surgery was uneventful, the patient was extubated after residual neuromuscular blockade was reversed with IV neostigmine 2.5 mg and glycopyrolate 0.4 mg and once the extubation criteria were met. The patient was conscious, oriented, obeying oral commands, and pain free. Postoperatively, the patient received injection paracetamol 1 gm IV infusion 12th hourly and injection tramadol 50 mg as and when the visual

analogue score was equal to or more than 5. The patient was shifted to high dependency unit (HDU) for further monitoring and was uneventful. The patient was discharged from HDU after 48 h.

Figure 4: Excision of carotid body.

DISCUSSION

The carotid body, first described by von Haller in 1743. It is a highly specialized chemoreceptor organ situated at the bifurcation of CCA, which detects changes in arterial oxygen tension.[1] It is stimulated by hypoxia, hypercapnoea and acidosis and in response, controls the BP, HR and respiration by increasing the sympathetic flow. Chronic hypoxemia-sustained/intermittent stimulates hyperplasia of the gland.[2] It receives blood supply predominantly from ascending pharyngeal artery (branch of ECA) and is innervated by glossopharyngeal and vagus nerves.[3,7] CBTs are rare neoplasms. Though slow-growing and benign, they can invade/exert pressure on neighbouring neurovascular tissues. 5-7% may be malignant.[3] History of uncontrolled/recently diagnosed hypertension, tachycardia, flushing and excessive sweating suggested a catecholamine-secreting CBT.[11-13] We did not do preoperative catecholamine studies as our patient had no such symptoms and was non-affording. Biopsy, in a suspected case of CBT may be catastrophic and hence, is contraindicated.[4] Diagnosis is made by USG, CT scan and MRI, with carotid angiography being the gold standard. Surgery is the definitive treatment for CBT. Radiotherapy is reserved for elderly and those in poor general condition. Administration of alpha-blockers preoperatively and beta-blockers intra-operatively can prevent/control the dangerous surges in BP occurring during induction of anaesthesia and surgical manipulation during excision of functional paragangliomas.[5] Risk of considerable rapid blood loss during surgical resection necessitates the use of invasive monitoring, hypotensive anaesthesia and availability of minimum four units of cross-matched blood.[7] If carotid artery has to be clamped. Intraoperatively, carotid sinus stimulation causes reflex bradycardia which usually responds to IV atropine.[6] Our patient, however did not have any bradycardia.[8] Involvement of cranial nerves (IX, X, XI) by tumor invasion preoperatively, nerve injury intra-operatively, or tissue oedema causing nerve palsy postoperatively may predispose to airway obstruction or aspiration. Gastroparesis may also increase risk of aspiration necessitating intermittent nasogastric suctioning in the postoperative period. Frequent observation for stridor and wheezing following extubation and prophylactic ventilatory support is indicated due to the dynamic nature of oedema around cranial nerves postoperatively.[9,10] Other postoperative neurological complications like hemiplegia, recurrent laryngeal nerve palsy, Horner's syndrome and hypoglossal nerve palsy.

CONCLUSION

Surgery of carotid body tumors requires close monitorization, and complex anaesthetic management. Cerebral monitorization, and preservation of cerebral perfusion are important issues especially during tumoral resection, and cross-clamping. During preoperative period, performing necessary preparations, being prepared for excess amounts of blood loss, and maintenance of optimal blood pressure levels against sudden hemodynamic changes are among the basic components of anaesthetic management.

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REFERENCES

1. Luna-Or K, Rascon-Or M, Villavicencio-Valencia V, Granados-Garcia M, Herrera-Gomez A. Carotid body tumors: Review of a 20-year experience. Oral Oncol. 2005;41(1):56-61.
2. Del Guercio L, Narese D, Ferrara D, Butrico L, Padricelli A, Porcellini M. Carotid and vagal body paragangliomas. Transl Med UniSa. 2013;6:11-5.
3. Obholzer RJ, Hornigold R, Connor S, Gleeson MJ. Classification and management of cervical paragangliomas. Ann R Coll Surg Engl. 2011;93(8):596-602.
4. İlhan G, Bozok Ş, Özpak B, Güneş T, Gökalp O, Bayrak S, et al. Diagnosis and management of carotid body tumor: a report of seven cases. Turk Gogus Kalp Damar Cer Derg. 2013;21(1):194-200.
5. Mataracı İ, Rabuş MB, Kırali K, Kıran B, Yanartaş M, Sunar H, et al. Diagnosis and surgical treatment of carotid body tumors. Turk Gogus Kalp Damar Cer Derg. 2008;16(3):86-90.

6. Offergeld C, Brase C, Yaremchuk S, Mader I, Rischke HC, Gläsker S, et al. Head and neck paragangliomas: clinical and mo- lecular genetic classification. Clinics (Sao Paulo). 2012;67(1):19-28.
7. Milewski C. Morphology and clinical aspects of paragangliomas in the area of head-neck. HNO. 1993;41(11):526-31.
8. Davidovic LB, Djukic VB, Vasic DM, Sindjelic RP, Duvnjak SN. Diagnosis and treatment of carotid body paraganglioma: 21 years of experience at a clinical center of Serbia. World J Surg Oncol. 2005;3:10.
9. Berg R. Imaging and management of head and neck paragangliomas. Eur Radiol. 2005;15(7):1310-8.
10. Pacheco-Ojeda L. Malignant carotid body tumors: Report of three cases. Ann Otol Rhinol Laryngol. 2001;110(1):36-40.

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