

Problems Encountered during Radiotherapy in Head Neck Cancer Patients with Carotid Sinus Syndrome: A Case Report

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Abstract

Carotid sinus syndrome is a rare condition that is characterized by paroxysmal episodes of syncope, bradycardia and hypotension, the exact etiology of which remains unclear, it is also a rare finding in head and neck cancer patients

In this article we present a case of a 60 year old male who is a known case of Carcinoma Left lateral border tongue with nodal recurrence and developed the above features of carotid sinus syndrome while undergoing treatment with external beam radiation therapy. It also states the interventions and modifications done during treatment to overcome the problem of carotid sinus syndrome such that radiation could be completed.

Keywords: Carotid sinus syndrome; Head and neck cancer; External beam radiotherapy.

Introduction

Carotid sinus hypersensitivity is defined, by the new Guidelines of the European Society of Cardiology (ESC) as syncope with reproduction of symptoms during carotid sinus massage (CSM).¹

The exact cause of CSH is not well understood. However, it is known that CSH incidence increases with aging, as CSH is very unlikely before the age of 50. Furthermore, it is more common in men than in women, especially those with chronic medical conditions (hypertension, coronary artery disease, diabetes, and valvular pathologies).²

The baroreceptors present in the body commonly include the carotid sinus located posterior to the carotid bulb and the aortic sinus located in relation to the aortic arch; these baroreceptors detect change in stress and Blood pressure and are having a rich innervation. The carotid sinus is innervated by the Nerve of Herring, a branch of the glossopharyngeal nerve (IX) which carries impulses from the carotid sinus to the Nucleus Tractus Solitarius located in the Medulla Oblongata. Stimulation of these receptors results in the decrease in the sympathetic flow and therefore there is production of syncopal symptoms.³

In patients with the head and neck cancers, the tumour may directly or indirectly encase the common carotid artery and may result in the compression and or excessive stretching of the carotid sinus baroreceptors. This excessive stimulation of the baroreceptors results in an unwanted exaggerated response causing a further decrease in the central sympathetic outflow. The above is responsible for the features of carotid sinus syndrome.³

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Case Report

A 43 year old male presented with the complaints of ulcer over the left lateral border of tongue since 2 months which was insidious in onset gradually progressive and associated with occasional bleeding from gums and was non-healing in nature. There were no associated complaints of discharge and pain. The general examination did not reveal any significant finding and on local examination there was an ulcer over the Left lateral border of the tongue approximately 2 cm long infiltrating floor of mouth. Biopsy from the ulcer was suggestive of Well Differentiated Squamous Cell Carcinoma.

An MRI Neck with contrast revealed lesion arising from the left lateral half of tongue approximately $2.8 \times 1.1 \times 2$ cm, Cervical lymphadenopathy in bilateral level IB and II and left supraclavicular region approximately 4.7 mm in size. (Fig. 1)

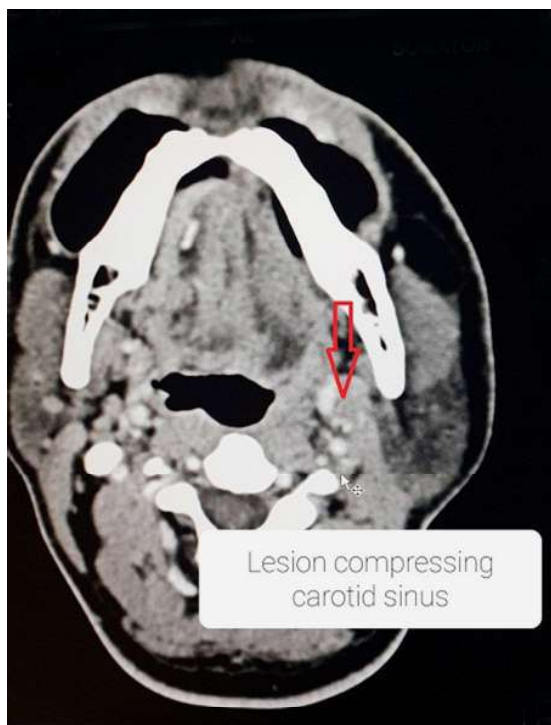


Fig. 1: CT Scan film showing mass engulfing the Carotids.

The patient underwent Left Hemiglossectomy and Left Radical neck dissection with Right Free Radial Artery Forearm Flap.

The Post Operative hispathological finding revealed Well Differentiated Squamous Cell Carcinoma having a Timor size of $5.5 \times 3.9 \times 2.2$ cm with peripheral invasion and a microscopic depth of invasion of 9mm and none of the lymph node showed metastasis. The patient was advised post operative concurrent chemoradiation but the patient refused for further management.

After 1 year again the patient presented with complaints of swelling in the neck along with paroxysmal episodes of syncope and diaphoresis on neck flexion. Contrast Enhanced CT scan of the neck revealed soft tissue density lesion in the submental and left submandibular region approximately $6 \times 4 \times 3.8$ cm encasing the left common carotid artery.

The patient was then referred for further management where he was planned for concurrent chemotherapy and radiotherapy. Orfit immobilization cast for the head and neck with neck in extended position was made and the patient was taken for Radiotherapy planning CT Scan. During the procedure it was observed that after application of the immobilization cast the patient developed complaints of excessive sweating, dizziness and syncope which were relieved after some time. To rule out a cardiac cause ECG and 2D Echo of the patient was done which revealed no abnormalities.

Carotid sinus hypersensitivity was suspected for which a HUTT (head up tilt test) was performed to detect latent Orthostatic hypotension. The HUTT revealed latent orthostatic hypotension. The most probable cause of this orthostatic hypotension was attributed to carotid sinus hypersensitivity caused due to the encasement of the carotid by the lesion as mentioned above.

Then the patient was again taken up for preparation of orfit immobilization cast with neck partially flexed keeping in consideration the carotid sinus location so as to reduce the pressure of the cast on the anatomical landmark of the carotid sinus (Fig. 2).



Fig. 2: Orfit caste made with neck flexed to reduce compression on Carotid Body.

The cast was kept loose on the left side so as to meet the above conditions and the patient was taken up again for radiation and then the radiation of the patient was restarted. After this minor changes made the patient did not had any syncopal attack and could complete the treatment comfortably without any complaints of syncope, diaphoresis and giddiness.

Discussion

Carotid sinus hypersensitivity is a rare condition characterized by sudden syncopal episodes along with giddiness, diaphoresis and sweating.^{1,2} The exact etiology of this syndrome is not known but it is attributed to the overstimulation and sensitization of the carotid baoreceptors located in the carotid sinus.²

Kharsa A Wadhwa in their report stated that one of the causes for the development of carotid sinus hypersensitivity is head and neck cancers which compress the carotid sinus leading to the syncopal episodes. In our case also the patient developed recurrence which was associated with the tumor compressing the carotid sinus.

Wada K Hirota and T Shinoda Y reported in their study, palliative radiation was a feasible and effective treatment for the manifestations of carotid sinus syndrome. In our case also it was seen that the symptoms of carotid sinus hypersensitivity reduced as the patient was taken for radiotherapy.

Due to compressive effect of the immobilization

cast on the neck it was observed that the patient developed episodes of syncope and giddiness during treatment, but as soon as the immobilization caste was removed and the neck flexed there was normalization of the symptoms. When the cast was made again with neck in partially flexed position it was observed that carotid sinus hypersensitivity had reduced and the patient could tolerate treatment without development of syncopal symptoms.

Conclusion

In Head and Neck cancer patients it can be observed from the above that tumors encasing and compressing the carotid sinus lead to its excessive stimulation causing carotid sinus hypersensitivity and in these patients one should be vigilant while making the immobilization caste of the patient keeping in mind the pressure the cast would exert on the carotid sinus and associated manifestation of the carotid sinus hypersensitivity.

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