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Glomus Jugulare: A Case Series

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Cover Page Footnote

Nil

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Abstract

Background: Glomus Jugulare tumours arise within the jugular foramen of the temporal lobe. Treatment and management of these very rare, slow growing and hypervascular tumours are always challenging. Patients with these tumours will have their lower cranial nerves affected. With the involvement of lower cranial nerves, the patients may have altered functions of swallowing, chewing, hearing, speaking, balance and coordination. Thus, these patients can be managed effectively by a nurse with the thorough knowledge and understanding of the signs and symptoms. The nurses taking care of these patients should anticipate these dysfunctions and plan the care of patients accordingly.

Keywords: Glomus Jugulare tumour, Jugular foramen, Lower cranial nerve deficits, Neurological examination.

Introduction

Jugular foramen is a large aperture located behind the carotid canal in the base of the skull. It is formed by the petrous portion of the temporal bone in the front, and by the occipital bone behind; it is usually larger on the right side than on the left.

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Tumors developing at the jugular foramen are rare and normally benign. Many lower cranial nerve deficits may develop due to the compression of these tumors on the cranial nerves passing through jugular foramen (Coles M. C., 2004) (Hakuba, Hashi, Fujitani, Ikuno, Nakamura, & Inoue, 1979).

In India, a large number of nurses who care for such patients are either diploma trained or undergraduate nurses and do not have advanced skills in recognizing lower cranial nerve deficits or other complications. Only the post-graduate neuro nurses and the post basic diploma neuro nurses learn in depth about these conditions in India as per their syllabus. Here we describe two patients diagnosed with and operated for glomus jugulare for the benefit of the nurses of India at large.

Case presentation 1

A 45 year old female with Glasgow Coma Scale (GCS) 15 was presented to our emergency triage with complaints of headache and vomiting for seven days. On the same day patient got admitted in Neuro ICU. This was in April, 2015. She was not a known case of hypertension, diabetes mellitus or ischemic heart disease. She had a history of

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coughing while swallowing, change in voice for last seven years, tinnitus, vertigo, gait imbalance, and decreased hearing for five years. The patient also had history of deviation of tongue to the right side and loss of taste for the last three months. She had undergone investigations and treatment in local hospitals before coming to our unit. There was no surgical treatment advised in the local hospitals and was treated conventionally. She was diagnosed with nodular colloidal goiter four years back and was treated with drugs for the same. During that period, she noticed asymmetry in shoulder and change in voice. Decreased hearing on the left side was perceived by her from the year 2013. Concurrently, she was diagnosed with fibroid uterus and had undergone total abdominal hysterectomy and bilateral salphingio oophorectomy for the same.

Neurological examination of Cranial Nerve VIII showed right sided ptosis, impaired taste sensation. Rinnes test showed bone conduction greater than air conduction on left ear and air conduction was equal to bone conduction in the right ear which indicated conductive hearing loss on both the ears and Webber's test showed lateralization to the left. Cranial Nerve IX and X assessment showed palate not moving, deviation of the uvula to left and decreased gag reflex. Cranial Nerve XI assessment showed decreased shrugging. Cranial Nerve XII assessment showed inflamed tongue surface, deviation to right side and wasting. At the time of admission to our unit, physical examination findings revealed involvement of cranial nerves VIII, IX, X, XI and XII.

MRI showed a large lobulated firm, vascular space occupying lesion with multiple venous bulbs. It was seen in the right cerebello pontine angle cisterna, cerebro medullary cisterna and extending up to the pre pontine cistern and extending in the Jugular foramen and porous acoustium.

Right far lateral approach was the surgical method chosen for the subtotal excision of right jugular foramen space occupying lesion. Tumour was dissected in jugular foramen and internal jugular vein was seen and preserved. Surgery was done under general anaesthesia.

Immediately following the procedure, patient was kept on nil per oral for 24 hours and 30 degree head end elevation was given. Initially she was on ventilator on SIMV mode with Tidal volume - 450 ml, FiO₂ - 60%, RR - 16 bpm, PEEP- 5 cm of H₂O and pressure support 10 cm of H₂O. Patient was extubated the day after surgery. Post operatively she was prescribed with antiepileptic, diuretics, antibiotics and steroids. She was given mild sedation on the days when she was on ventilator. Eye care was given fourth hourly; antibiotic were given and lubricant eye drops were applied. On the third post-operative day, nasogastric feed was started and the quantity of the feed was increased on the fourth post op day. Nasogastric tube was removed and she was started with oral feeds on the sixth day after checking the gag reflex. Patient continued to receive care and physiotherapy for one more week before she got discharged.

Case Presentation 2

A 60 year old male got admitted in Neuro ward with the complaints of headache on right side of the face, it lasted throughout the day for three years and increased gradually and was severe for one month. Patient also had phonophobia, photophobia, and dysphagia with history of regurgitation of food from left nostril, odynophagia, giddiness, ear discharge and vomiting, vertigo for four to five months, which decreases on lying down and voice change for two months. Patient complained of experiencing 64 episodes of throbbing type headache and decreased hearing in the right ear for one year. Patient used to sway towards right. Patient had palsy of vestibulocochlear nerve and during the time of admission patient's GCS score was 15.

On neurological examination, patient had vestibulo cochlear nerve abnormality. All the other nerve functions were found to be normal. In MRI, small right jugular foramen in plaque meningioma was found.

On March 3, 2015 Craniotomy and excision was done for Right Jugular Foramen Meningioma (Glomus Jugulare) and on March 25, 2015, Right retromastoid craniectomy and excision of schwannoma was done for Right CP angle space occupying lesion -

schwannoma. Tumour was removed preserving vertebral artery and internal jugular vein. Operation was done under general anaesthesia.

Post operatively patient had nystagmus, right sided hearing loss, left uvula was deviated to right and was enlarged. Cerebellar signs like incoordination of limbs, ataxia was also present. Post operatively, patient was on anticonvulsants, antihypertensive and corticosteroids.

Initially the feed was given through nasogastric tube as there was no gag reflex. Semisolids were started as the gag reflex returned. Eye care was given every fourth hourly. Immediate post operatively, he was positioned with 30 degree head elevation and was monitored continuously. Ambulation was started early and he was helped to walk with support. The patient continued to receive care and physiotherapy for almost two weeks in our unit before he got discharged.

Discussion

In both of these case presentations the patients manifested almost similar signs and symptoms with the lower cranial nerves affected. Nurses providing care for the patients with Glomus Jugulare tumors should be skilled in identifying lower cranial nerve deficits and its associated potential complications (Coles, 2004). Thorough knowledge and understanding of the reasons for the associated signs and symptoms of Glomus Jugulare tumours helps the nurses in providing quality care to the patients.

Facial Palsy on extubation

Facial Nerve was affected due to the surgical procedure which is an expected outcome of the surgery as the course of facial nerve is near to the jugular foramen. Most of the literature reveals facial nerve palsy as a side effect of the surgery rather than the initial manifestation of the disease. The facial nerve travels into the internal acoustic meatus through the facial canal then out through the stylomastoid foramen. (Nunez, Ramos-Duran, & Cuetter, 2014)

Patient was informed about this risk preoperatively and was assured that palsy will get cured after a few

months. Patient and patient relatives were provided with adequate education and psychological support.

Tinnitus, vertigo, imbalance, decreased hearing

This could be due to the compression or damage to the eighth cranial nerve. The vestibular portion of the eighth cranial nerve helps in equilibration and coordination. And the cochlear portion helps in hearing. As with tuning fork testing, in sensorineural deafness, both Air Conduction (AC) and Bone Conduction (BC) were impaired while retaining their normal relationship of AC better than BC. This patient had air conduction same as bone conduction on the right ear. With Weber's test, the patient exhibited lateralization to normal side which indicates sensorineural hearing loss. Dysfunction of the cochlear nerve and its connections usually causes either diminution or loss of hearing (hypacusis or anacusis), with or without tinnitus (William, 2005). The primary manifestation of disorders of the vestibular nerve is vertigo and related symptoms such as imbalance. In true vertigo, the presence of associated symptoms, such as nausea, vomiting, staggering, deviation of the eyes, disturbances of balance, prostration, tinnitus, hearing loss, or loss of consciousness is important.

The patient was informed that the symptoms will resolve three to six months after surgery. Nursing care was focused on decreased hearing. Patient was educated appropriately on the usage of hearing aids. Attentive listening to the words of the patient, using simple words and short sentences while communicating with the patient were the other important aspects which were taken care of. Patient was given assistive devices while ambulating, and the patient relatives were also educated not to ambulate the patient if there are symptoms of vertigo.

Coughing while swallowing and Change in voice

This is due to the effect of tumor compression on the glossopharyngeal nerve. Jugular foramen has got an anterior compartment and a posterior compartment. The glossopharyngeal nerve after arising from the brain stem, passes along with the vagus nerve through the anterior compartment of the jugular foramen. It has got both sensory and motor components. The sensory components

carry afferent inputs to the brain stem. The motor component of the glossopharyngeal originates in the rostral part of the medullary nucleus ambiguus, and innervates the stylopharyngeus muscle, which takes part in swallowing. The nerve also innervates the Eustachian tube, and the middle ear. The motor efferent of the vagus originate in the nucleus ambiguus of the medulla, and innervate the muscles of the larynx, pharynx, soft palate, and the upper esophagus. Therefore, damage to the nucleus ambiguus affects speech and swallowing ear (Greenstein & Greenstein, 2000).

Nursing care consists of feeding through nasogastric tube to prevent aspiration. Patient was provided with small frequent feed in order to ensure easy digestion as well as prevention of regurgitation. Patient was also provided with speech therapy to improve the hoarseness of the voice.

Inability to lift the right hand

It is due to the damage to the accessory nerve. It is a purely motor nerve and consists of cranial and spinal divisions. Spinal accessory supplies the sternocleido mastoid and trapezius muscles (Greenstein & Greenstein, 2000). The trapezius helps in the elevation of the shoulder. With weakness or paralysis, these functions are decreased or absent. With the nuclear or infranuclear lesions, there is associated fasciculation and muscle wasting.

Nursing care included physiotherapy such as active and passive exercises to improve the muscle strength. Trans Electrical Nerve Stimulation (TENS) was also provided to stimulate the nerve, thereby decreasing the weakness.

Deviation of tongue to one side

The hypoglossal nerve is also a purely motor nerve, which supplies the extrinsic and intrinsic muscles of the tongue. If the hypoglossal nucleus nerve is lesioned unilaterally, this results in tongue paralysis on the ipsilateral side. The tongue atrophies and becomes distorted, mainly because the mucous membranes of the tongue are too large to be accommodated by the reduced tongue volume (William, 2005).

Nursing care comprised feeding through Ryle's tube due to the inability of the patient to chew due to tongue atrophy and paralysis. Later patient was given orally after assessing the swallowing reflex. Patient was fed by placing food in the unaffected side in an upright sitting position and was encouraged for taking small bites and was advised for thorough chewing. (Joanne, 2003)

Conclusion

As the lower cranial nerves are affected in jugular foramen tumors, the patients may have difficulty with swallowing, chewing, hearing, speaking, balance and coordination depending on the extent of involvement. Nurses play a vital role in maximizing patients' functioning ability by understanding the mechanisms by which these signs and symptoms develop and by anticipating certain complications thereby preventing them.

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