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AN ISOLATED FACIAL NERVE PALSY IN NASOPHARYNGEAL CARCINOMA: A RARE CASE REPORT

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ABSTRACT: The fossa of Rosenmuller is the most common site of NPC. It arises from the lining mucosa of the nasopharynx. Around one-fifth of NPC patients presented with cranial nerve palsy. The tumor can penetrate the skull and surrounding cranial nerves because fossa of Rosenmuller is situated next to the foramen lacerum. A 57-year-old male patient arrived at the medical college and Hospital, Kolkata ENT OPD complaining of headache, fullness in his ears, a mass on his left neck, and nosebleeds. The patient's vision was normal. Following a comprehensive physical examination, radiography, histology, and history taking following examinations, the patient was identified as having House Brackmann III facial nerve palsy at the level of the mastoid segment and WHO 3 ECOG I T4N2M0 stage III NPC. A regimen of paclitaxel-cisplatin for six rounds was administered. In conclusion, NPC has the unusual potential to result in facial nerve paralysis.

INTRODUCTION: Particularly to an otolaryngologist dealing with facial nerve palsies are a frequent and important presentation in both general medicine and ENT practice. Because it is a vital structure for both emotion and communication, damage to it can have a serious negative impact on life quality. The majority of cases of facial nerve palsy have an idiopathic cause, which is known as "Bell palsy" in 70% of cases. Trauma (10 to 23%), which is typically brought on by fractures involving the petrous temporal bone, and cut injury over face that involves branches of the facial nerve, are the next most common causes of facial nerve palsies after Bell's palsy. As a result of geniculate ganglionitis, a viral varicella-Zoster infection (4.6–7.0%) can cause facial paralysis which is also known as Ramsay Hunt syndrome (RHS). Nasopharyngeal carcinoma (NPC), formerly called lymphoepithelioma, is a cancer that develops from the nasopharynx's epithelium. The genesis of illness involves the interaction of genetic makeup, environmental variables, and Epstein-Barr virus (EBV) infection. At the time of diagnosis, cranial nerve involvement affects one-fifth of individuals with NPC.

The first (I), seventh (VII) and eighth (VIII) cranial nerves are infrequently impacted by nasopharyngeal carcinoma, in contrast to the fifth (V) and sixth (VI) cranial nerves that are commonly implicated. Diplopia, cheek loss, brisk corneal reflexes, and headaches affecting the II, III,

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IV, V, and VI cranial nerves are among the symptoms of the neurological illnesses. Ninth (IX), tenth (X), eleventh (XI), and twelfth (XII) cranial nerve disorders can result in palatal palsy, dysphagia, and tongue deviation. Less than 1% of cases involve disorders affecting the seventh (VII) and eighth (VIII) cranial nerves [1, 2].

In non-primary cerebral palsy, less than 1% of patients develops facial nerve palsy. After leaving the brainstem, the facial nerve passes *via* the temporal bone, the cerebellopontine angle (CP), and the parotid gland; from there, it branches off to feed the face muscles. Anywhere along the nerve that has a tumor might induce facial paralysis. The foramen lacerum, the center base of the skull, and Rosenmüller's fossa are all close by, making it possible for a tumor to spread straight to the skull and surrounding cranial nerve [3]. This research aims to present a unique instance of facial nerve palsy in NPC [4].

Case Proper: A 57-year-old male patient arrived at the ENT OPD complaining of a mass on the left side of his neck, blockage of ears, nosebleeds, and asymmetry of the right facial muscle that started three months earlier. Double vision was not reported by the patient. He had smoked for twenty years and consumed salted fish on a regular basis.

This individual appeared to be alert, conscious, co-operative, well oriented to time, place and person and general survey was found normal. Examination of the facial nerve was assessed by clinching mouth to show teeth, lifting eyebrows and puff his cheeks revealed weakness on right side.

Table 1 describes further investigation of the facial nerve. Additionally, we discovered swollen lymph nodes with the same skin tone all around on the right and left sides of the neck, at levels II and III, measuring 2*2*1 centimeter.

TABLE 1: FACIAL NERVE EXAMINATION

Examination	Right	Left
Lifting eyebrows	-	+
Frowning eyebrows	-	+
Lifting and wrinkling nose up	-	+
Tight closure of eyes	-	+
Clinching mouth to show teeth	-	+
Puffing of cheeks	-	+
Whistling	-	+
Pull the corners of the lips down	-	+
Gustatory test	-	+
Stapedius reflex	+	+
Scheimer test	10mm	5mm

On diagnostic nasal endoscopy (DNE) examination, the mass involving the right choana near the right torus tubarius. The mass's surface was uneven, brittle, and prone to bleeding. Three sites were used for the biopsies. The diagnosis of undifferentiated non-keratinizing squamous cell carcinoma is supported by the histopathological and immunohistochemical findings.

The audiometric examination findings revealed that the left ear was within normal range (PTA 22.5 dB), but the right ear had a severe mixed degree of hearing loss (PTA 85.55 dB). The tympanometry results show that the right acoustic reflex is positive, the left ear is positive, and the right ear is B. The assessment of the facial nerve revealed House Brackmann III facial nerve paresis.

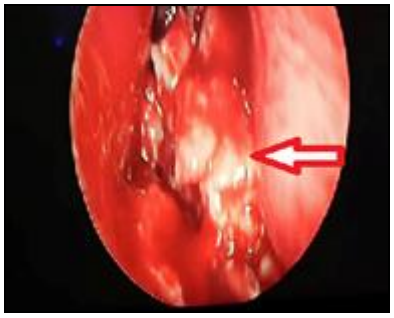

FIG. 1: DIAGNOSTIC NASAL ENDOSCOPY EXAMINATION

Red arrow: a mass involving the right torus tubarius extending to the right choana. The right nasopharyngeal mucosal area on a 1.5T MRI scan revealed a non-homogeneous mass involving the right parapharyngeal space, right carotid space, right retropharyngeal space, and right level III, on

the left level, with the biggest dimension of ± 2.66 × 2.16 cm and a propensity to be a nasopharyngeal mass (T4N2Mx), no indications of increasing intracranial pressure (ICP), as well as the formation of right mastoiditis.

FIG. 2: CORONAL, PARA-SAGITTAL AND AXIAL T1-WEIGHTED MRI SHOWING NPC INVOLVING NASOPHARYNX, MAXILLA AND OROPHARYNGEAL SPACE ON RIGHT SIDE

Results of 1.5 T MRI. The right sided nasopharyngeal mucosal space, right carotid space, right retropharyngeal space, right masticator space, right oropharyngeal mucosal space as well as the right maxillary sinus were all affected by the inhomogeneous mass **Fig. 2.**

At the level of the Mastoid segment, the patient was diagnosed as WHO 3 ECOG I T4N2M0 stage III NPC with House Brackmann III facial nerve palsy, based on the history, physical examination, radiological and histopathological examination. The patient had six cycles of chemotherapy using a paclitaxel-cisplatin combination.

DISCUSSION: In this study, a case of NPC with facial nerve palsy as a complication is described. Five percent of all facial nerve palsies have a tumor as their source, and NPC is one of them. A facial nerve examination, which revealed a House Brackmann III paresis of the VII nerve at the Mastoid segment level in this instance.

A cancer that starts in the mucosal lining of the nasopharynx's surface is known as nasopharyngeal carcinoma [5, 6, 7].

The parapharyngeal space may be a conduit for the local dissemination of NPC **Fig. 3** [5, 8, 9].

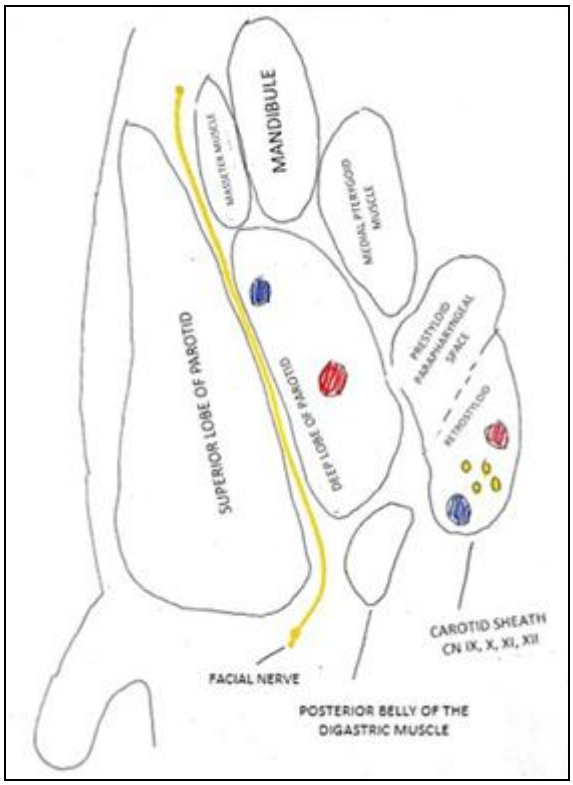

FIG. 3: ANATOMY OF THE PARAPHARYNGEAL SPACE (AXIAL VIEW)

Vertical Upward Spread: "Petro sphenoid spread" refers to the intracranial extension along the medial wall. Then it spreads via foramen laserum and involves intracranially into the cavernous sinus,

middle cranial fossa as well as anterior cranial fossa, affecting the I and VI cranial nerves. Petro sphenoid syndrome is the term for symptoms brought on by tumor metastasis that damages the anterior cranial nerves. Diplopia (double vision) and trigeminal neuralgia are the most prevalent symptoms.

Reverse Spread: Retroparotidian spread refers to the tumor's extracranial extension occurs via pharyngobasilar fascia along the posterior fossa (IX and XII cranial nerves). Together with the cervical sympathetic chain, it affects the VII and XII cranial nerves. Retroparotidian syndrome, also known as jugular Jackson syndrome, is the term for symptoms caused by any lesion involving the IX, X, XI and sometimes XII cranial nerves. Due to their high anatomical location inside the body, VII and VIII cranial nerves are rarely affected by malignancies.

Reach the Lymph Nodes: The Rouviere nodes or the retropharyngeal lymph nodes are the epicenter of lymph node spread. The growth and multiplication of cancer cells inside the gland causes the gland to expand and develop a swelling on the lateral aspect of neck. Patients frequently disregard this bump since it doesn't hurt. Subsequently, malignant cells will proliferate and eventually penetrate outside the glands, damaging the muscles underneath and causing them to become difficult to move.

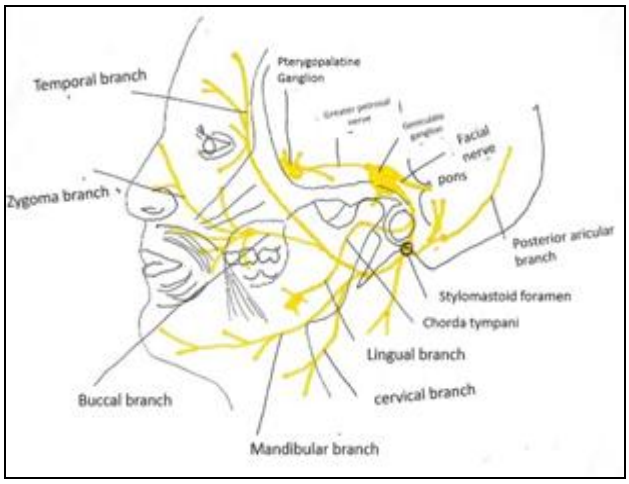

FIG. 4: FACIALNERVE BRANCHES

Distant Metastases: Organs such as bones, liver, and lungs that are distant from the nasopharynx can be attacked by cancer cells that infiltrate the blood or lymphatic system. The facial nerve supplies several extracranial structures after exiting from the stylomastoid foramen and passing within the parotid gland. This nerve supplies the digastric, stylohyoid and stapedius muscles, and in charge of motor innervation to all face expression muscles. The anterior two-thirds of the tongue get sensory components from the chorda tympani branch of facial nerve, while the submandibular, sublingual, nasal palatine, lacrimal, and pharyngeal glands receive parasympathetic nerve supply from the facial nerve, except the parotid glands [10].

The facial nerve leaves the brainstem at the cerebellopontine angle (CPA), travels via the temporal bone (internal acoustic meatus and mastoid, middle ear) and the parotid gland, before branching off to supply the facial muscles. Face paralysis may result from tumor infiltration along the face nerve's route or from inflammation. CPA tumors, NPCs (which are typically associated with other cranial nerve problems), and parotid gland tumors are the most frequent intracranial tumors. In CPA, cancer metastases (hematogenous, via CSF or cerebrospinal fluid) or leptomeningeal dissemination may be the cause of facial nerve involvement, whereas ear involvement may arise from an invasion that occurs directly through the parapharyngeal space or eustachian tube. Tubal blockage may be the cause of indirect invasion. The eustachian tube's proximity to fossa of Rosenmüller's can result in increased negative pressure inside the tympanic cavity, which leads to otitis media with effusion (OME). If left untreated, this condition can also develop mastoiditis and facial paresis. When the parotid gland is involved by any lesion and the facial nerve is affected, there is a possibility of the tumor spreads to the retropharyngeal group of lymph nodes, which may then empty into the parotid gland. The tumor can reach the facial nerve, parotid parenchyma, lymphatic plexus, and even the parapharyngeal region from the parotid gland [11].

As nasopharyngeal carcinoma is prevalent in certain geographical areas especially Southeast Asia, so Epstein Barr Virus (EBV) infection cannot be overlooked. EBV virus mainly associated with undifferentiated squamous cell carcinoma of nasopharynx. Due to close association with EBV virus, EBV related biomarkers have been used now a days to screen those high-risk areas with clinical

manifestations of nasal obstruction with multiple cranial nerve palsies [12, 13, 14, 15]. Based on MRI imaging, facial paresis was caused in this case by retroparotidian spread of the mass toward the parapharyngeal, retropharyngeal, carotid as well as masticator space. Because of the bulk decrease brought about by chemotherapy, the prognosis for facial palsy was favorable.

CONCLUSION: One of the consequences of NPC is facial nerve paralysis, but it is uncommon. The 57-year-old male in this case study has been diagnosed with House Brackmann grade III facial nerve paresis at the Mastoid segment as a result of stage III NPC that has retroperitoneally disseminated. Because of the significant reduction in chemotherapy, the prognosis for patients with facial nerve palsy is favourable.

Ethical Approval: Written informed consent has been taken from the patient for this publication. Both the clinical and surgical principles adopted for his management complied with the ethical standards of relevant national and institutional guidelines on human experimentation, as laid down in the Declaration of Helsinki, 1975, as revised in 2008.

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