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Advanced Nasopharyngeal Carcinoma with Metastatic Neck Nodes Masquerading as Neck Space Infection: A Case Series

Abstract – Neck space infections (NSI) and nasopharyngeal carcinoma (NPC) can occur in the same setting and are potentially fatal. Clinicians may delay or miss the diagnosis of NPC due to the initial infective symptoms of NSI with underlying undiagnosed NPC. Two cases of NPC with metastatic neck nodes masquerading as NSI were reported. Tumor-related obstruction, cystic metastases, and oral infections are proposed risk factors for superimposed infection. Any potential complication of NSI, such as airway compromise, should be addressed promptly before proceeding with appropriate diagnostic evaluations, including detailed history-taking, nasoendoscopy, imaging, and fine-needle aspiration cytology. Histopathological examination remains the gold standard for NPC diagnosis. The treatment of NSI can be a combination of antibiotics and incision and drainage, followed by daily wound dressing. The prognosis of both concomitant NSI and NPC cannot be concluded due to limited studies and case reports.

Keywords – Neck space infections, nasopharyngeal carcinoma, abscess

1 INTRODUCTION

Nasopharyngeal carcinoma (NPC) is highly prevalent in Southeast Asia, Southern China, and North Africa, and is the fifth most common cancer in Malaysia (5.2% of all cancers) [1], while it constitutes only 0.7% of cancers worldwide [2]. Male population is two to three times more likely to develop NPC than female [3]. Its varied and nonspecific symptoms frequently delay diagnosis. While clinicians can often diagnose and initiate timely treatment based on clinical presentation, delays may occur due to unclear history, patient denial, and limited access to diagnostic tools such as imaging and histopathology.

Both neck space infection (NSI) and NPC are potentially fatal conditions. Although NSI may coexist with NPC, it is uncommon for NSI to be the initial manifestation of primary head and neck cancer [4]. In acute NSI, initial management includes assessing the patient's condition, starting empirical antibiotics, followed by imaging and, if needed, surgical drainage. Airway compromise, sepsis, and cardiopulmonary complications are common. Radiological imaging may reveal masses or collections, but the presence of pus or necrotic discharge, especially during endoscopy,

may suggest an underlying malignancy such as NPC. In suspicious cases, thorough history-taking, imaging, and histopathological examination are essential to exclude malignancy. In this region, chronic infections like tuberculosis and melioidosis should also be considered as differential diagnoses.

2 CASE ONE

A 35-year-old Iban gentleman, with underlying hypertension, dyslipidemia, and active smoking status initially presented with intermittent feverish sensations for 3 months, and subsequently developed bilateral neck swelling and headache 2 months after symptom onset. He came to the emergency department (ED) of a district hospital with a one-day history of acute shortness of breath. Otherwise, he denied odynophagia, dysphagia, or a family history of malignancy. On neck examination, there was bilateral neck swellings that were mildly erythematous, tender, firm and non-fluctuant on palpation. The swelling involved bilateral neck levels II, III, and IV, with the largest mass measuring 8.0 × 4.0 cm over the left level II region. The skin was intact without any punctum.

His peripheral oxygen saturation was approximately 90%, and he appeared tachypneic. He was intubated in the ED by their anaesthesiology team due to respiratory distress and fluctuating levels of consciousness, as indicated by variable Glasgow Coma Scale (GCS) scores. He was then transferred to a tertiary centre hospital afterwards for further management. In view of his acute clinical presentation, computed tomography (CT) brain and neck was done at first place which revealed a rim enhancing collection (3.4 x 3.8 x 4.1 cm) involving the right peritonsillar, right torus tubarius, and both parapharyngeal regions with extensive edema and multiple enlarged cervical lymphadenopathy, with necrotic components seen at right level Ib, bilateral level II, III, IV, and V, largest measuring 6.3 x 4.8 cm and 7.3 x 5.1 cm on right and left level II and III respectively (Figure 1).

The preliminary diagnosis was sepsis secondary to a deep neck space infection. Nonetheless, the possibility of an underlying head and neck malignancy was also considered, given the patient's chronic history of neck swelling and persistent headache. Hence, direct laryngoscopy (DL), intraoral incision and drainage (I&D), nasoendoscopy and fine needle aspiration cytology (FNAC) over bilateral neck swelling were performed under general anesthesia. During the DL, his left parapharyngeal wall was incised, with around 8 ml of brownish fluid drained. A nasoendoscopy was performed from which a biopsy was taken over a mass situated at his bilateral Fossa of Rosenmüller (FOR) encroaching anteriorly to the posterior choanal region. Pus was aspirated from the bilateral neck and sent for FNAC.

Due to his poor GCS recovery, a second CT of the brain and neck was performed on day 4 of admission. It revealed residual left oropharyngeal and midline nasopharyngeal abscesses with a new finding of symmetrical well-defined hypodensities involving bilateral globus pallidus and bilateral corona radiata, extending to centrum semiovale in a parallel manner, suggestive of profound diffuse hypoperfusion. In view of the residual abscess, neck and intraoral exploration and bilateral hot tonsillectomy were proceeded and intra-operatively, the previous left intraoral parapharyngeal incision site was clear but the nasopharynx appeared bulging at the cervical (C1 and C2) level with cheesy material drained upon

incision. There was also a 10 ml pus drain from the right and left neck respectively.

The cultures from this second surgery came back as *Stenotrophomonas maltophilia* and *Acinetobacter baumannii*. Sulfamethoxazole/trimethoprim and ampicillin sodium/sulbactam sodium were administered. In view of persistent poor GCS recovery on day 10 of admission and well-healing neck wound, tracheostomy and secondary suturing of bilateral neck wound were done. The neck still appeared swollen bilaterally following the surgeries (Figure 2). Histopathological examination (HPE) of the bilateral nasopharynx and FNAC of neck node finally came back and showed non-keratinizing squamous cell carcinoma, undifferentiated subtype, and malignant cells respectively. CT neck, thorax, abdomen, and pelvis staged him as NPC Stage IVA. Based on his poor clinical condition, oncology team suggested the best supportive care for him instead of palliative chemotherapy or radiotherapy. The patient passed away on day 26 of admission. The cause of death was determined to be advanced NPC with superimposed NSI.



Figure 1. The neck was still swollen bilaterally and not resolving after I&D of the neck was done. Secondary suturing of the neck wound and tracheostomy were done for his well-healing neck wound and poor GCS recovery respectively

3 CASE TWO

A 47-year-old Malay gentleman with no known prior medical illness presented with a left-sided neck swelling that had been gradually increasing in size over the past 1 year, associated with reduced hearing on the same side for 6 months. He also reported intermittent left-sided epistaxis, nasal obstruction, and rhinorrhea for the past few months. Subsequently, he developed a 3-week history of progressively enlarging, painful swelling over his right neck which became fluctuant and discharged pus over the past 3 days, accompanied by fever and chills. He denied shortness of breath, noisy breathing, or difficulty swallowing, and was able to tolerate oral intake well.

On physical examination, he was alert and not septic in appearance. There was diffuse swelling of the right neck involving levels II, III, IV, V, and VI which was tender and erythematous, extending to the upper chest. The left neck swelling, located at level II, measured approximately 3.0 x 2.0 cm and was firm and non-tender. Nasoendoscopy revealed a mass at the left FOR, no obvious medialization of the lateral pharyngeal wall and a patent airway.

CT neck and thorax reported an ill-defined heterogeneous enhancing collection with air locules at the right posterior cervical space deep to the right sternocleidomastoid at the level of cervical vertebrae (C3 to C7), measuring approximately 6.0 x 6.2 x 7.2 cm, encasing the mid and lower portion of the right sternocleidomastoid muscle and displaced it laterally (Figure 3). There was another rim-enhancing collection noted within the left sternocleidomastoid measuring approximately 3.2 x 2.7 x 2.8 cm. There were numerous enlarged bilateral cervical nodes, some

with necrotic center, the largest at left level III measuring 2.2 x 1.8 cm. At the left nasopharynx, there was an ill-defined subtle enhancing mass extending to the right side and obliterating bilateral FOR. Superiorly, the mass extended to both sphenoid sinuses; Anteriorly, it extended to both ethmoid and left maxillary sinuses; Superolaterally, it involved the left infratemporal space and extended intracranially into the left anterior temporal region, associated with erosion of the adjacent bones.

An emergency incision and drainage of the right neck was performed by the Otorhinolaryngology (ORL) team (Figure 4), resulting in the evacuation of approximately 30 mL of purulent material. The wound cavity extended superiorly to the right angle of the mandible, inferiorly to the clavicle, and medially to the medial part of the sternocleidomastoid. The pus culture came back as *Klebsiella pneumonia* and he was treated with intravenous antibiotics and wound dressing. The HPE of the right neck tissue obtained intraoperatively was consistent with abscess tissue. The right neck wound healed well and was closed with secondary suturing following two weeks of daily normal saline and hypochlorous acid (hydrosyn) dressing.

A biopsy of bilateral FOR was performed which was reported as non-keratinizing, undifferentiated subtype nasopharyngeal carcinoma. CT staging showed that he had Stage IVB NPC (T₃N₂M_{1A}) with a right lower lobe lung nodule, suspicious of metastasis. He was treated with concurrent radio-chemotherapy at a tertiary hospital subsequently. He was seen in the ORL clinic six months after radio-chemotherapy and was overall well with bilateral neck swelling reducing in size. He was still on ORL clinic's monthly follow-up.

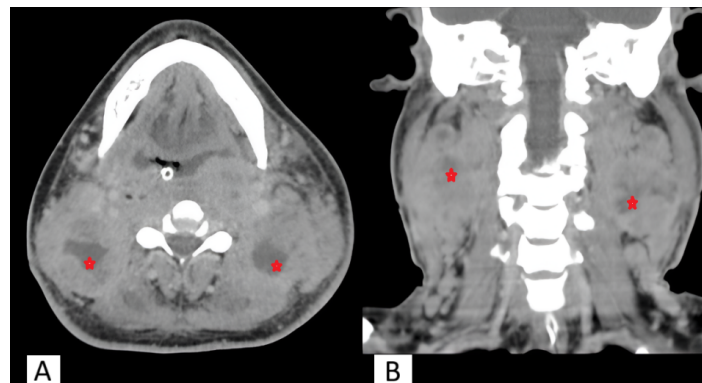


Figure 2. CT neck (A, axial view; B, coronal view) showed multiple enlarged cervical nodes with necrotic components (asterisk) within over bilateral neck level II, III, and IV

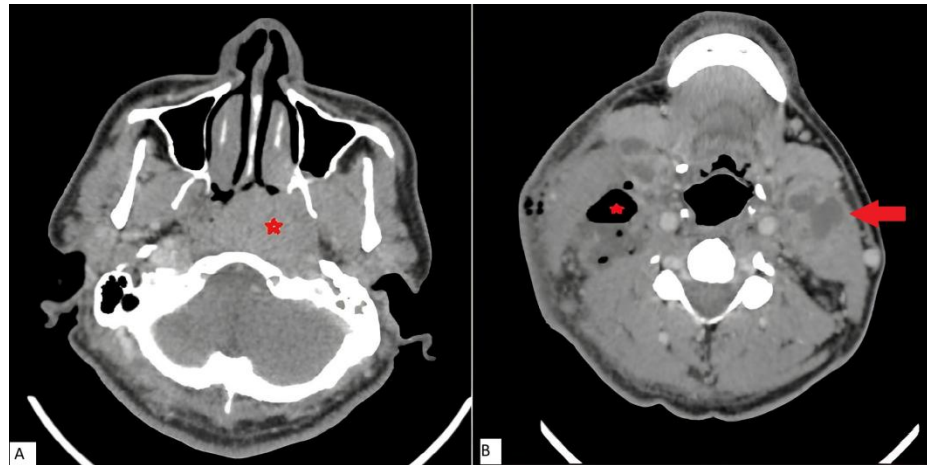


Figure 3. (A) There was an ill-defined subtle enhancing mass (asterisk) at the left nasopharynx, extending to the right side and obliterating bilateral FOR. **(B)** At the C3 level, an ill-defined heterogeneous enhancing collection with air locules (asterisk) at the right posterior cervical space deep to the right sternocleidomastoid, encasing the mid and lower portion of the right sternocleidomastoid muscle and displaced it laterally. There was another rim-enhancing collection noted within the left sternocleidomastoid measuring approximately 3.2 x 2.7 x 2.8 cm (red arrow)



Figure 4. Wound cavity of day 3 post incision and drainage of the right neck

4 DISCUSSIONS

NPC symptoms can be varied and atypical. Late presentation of NPC such as painless neck lump, epistaxis, and unilateral mild ear fullness incur late medical attention or awareness of the patient [5-7]. Lee et al. showed in his study that the commonest presentation was neck swelling (75.8%), followed by nasal congestion and epistaxis (73.5%), aural symptoms (62.4%), and headache (34.8%) [8]. In another study conducted by Suzina et al, 39.3% of patients had unilateral neck mass, 69.6% and 60.7% of them had nasal and aural symptoms respectively, while headache was seen in 41.1% of patients [6]. Chong et al,

discovered that 29.1% to 89% of their patients diagnosed with NPC had retropharyngeal lymphadenopathy which remained asymptomatic [9]. At a higher stage, the NPC can cause intracranial extension by causing erosive bone changes of the skull base or spreading through the skull base foramina [10].

The coexistence of neck infection or abscess with an underlying malignancy is however uncommon. The etiology and risk factors of this form of NSI are uncertain, with multiple theories suggested. Rolston KV highlighted that patients with solid tumors are at heightened risk of infection, partly due to tumor-related obstruction

as the malignancy advances and infections are typically mixed or polymicrobial since the causative microorganisms are usually those colonizing the obstructed site [11]. Wang et al. further discussed this possibility in their study which 7 out of their 3337 patients (0.2%) with N3 disease had very bulky cervical cystic masses and the size of the cystic degeneration was a critical step in developing NSI [4]. Among these 7 patients, 3 of them had pharyngotonsillar infection two weeks before and may account for the source of secondary infection of pre-existing cystic metastases while the other four had chronic uncontrolled diabetes. Both oral cavity infection and immuno-deficiency status (eg. diabetes in their study) seem to predispose bulky cystic metastases to infection, although a direct correlation between them has not been fully established. In diabetic patients, the hyperglycemia status might limit the neutrophil's bactericidal function, body immunity, and complement activation [12]. Furthermore, the diabetic population has a high prevalence of oropharyngeal colonization by gram-negative bacilli which their pharyngeal mucosa may be breached and the bacteria further invades the blood vessels beneath and spreads to the parapharyngeal space [13].

In cases where airway compromise is evident, as demonstrated in Case 1, the foremost priority is to secure the airway before proceeding with diagnostic or definitive surgical interventions. Airway management in such situations can be particularly challenging, especially when upper airway obstruction is suspected due to mass effect, edema, or infection. When there is uncertainty regarding the feasibility or safety of endotracheal intubation in the ED, an early flexible nasoendoscopic assessment by the ORL team can help determine the level and extent of obstruction, thereby facilitating a safer and more controlled approach to airway management. However, this service is not available in district hospitals, and the success of intubation largely depends on the expertise of the emergency department team.

In addition, early referral to the anesthesiology team should be considered. The choice between orotracheal intubation, fiberoptic intubation, or tracheostomy depends on the site and severity of obstruction, the clinician's expertise, and available resources. Soo et al. emphasized that in complex airway cases, anesthesiologists should integrate radiological findings with the patient's comorbidities and clinical symptoms to achieve

optimal airway management [14]. Once the airway is secured and the patient is hemodynamically stable, further diagnostic procedures—such as I&D, nasoendoscopy and biopsy under general anesthesia—can be safely performed.

Furthermore, when malignancy cannot be ruled out in neck abscess, FNAC of the lymph nodes can be performed. A persistent and progressively enlarged neck swelling or lymph nodes within the cervical neck spaces, or a single dominant node that persists for more than 6 weeks, should alert the clinicians to the potential of a malignancy case [15]. Thus, during the surgical drainage of the neck abscess, HPE of the abscess wall or the surrounding inflamed tissue must be sent to rule out malignancy [4]. Ideally, a biopsy should be obtained from the gross lesion at the nasopharynx or FOR. However, in the absence of a gross tumor, multiple biopsies can also be performed especially in those patients who are highly suspicious of NPC [16].

The prevalent usage of cross-sectional imaging, for example CT can provide wide information such as the disease extension, and perineural and intracranial involvement but magnetic resonance imaging (MRI) is superior to CT in visualizing nasopharyngeal soft tissues and distinguishing tumors from surrounding structures [17]. In our hospital setting, where access to MRI is limited and strictly regulated, clinical management often relies on the patient's presenting features while awaiting confirmatory results from FNAC of neck nodes or HPE of tissue samples. This approach, however, may contribute to delays in initiating appropriate treatment and consequently impact the patient's overall recovery.

Prognosis-wise, due to limited cases in English literature, it is difficult to draw a conclusion. Wang et al. however postulated that the prognosis of primary head and neck cancer with infection or abscess formation is poor even though definitive treatment was given [4]. The cause of this poor prognosis remains unknown but it's related to the possibility of angiogenesis of the tumor during the infection which might promote rapid tumor growth and spread.

5 CONCLUSIONS

NPC may remain asymptomatic in its early stages and later manifest with a wide spectrum of clinical presentations. Timely diagnosis and prompt initiation of treatment are critical factors influencing the prognosis of NPC. This case series underscores an uncommon presentation of NPC as NSI and emphasizes the importance of a

thorough ORL examination in raising clinical suspicion and facilitating early detection in such atypical cases.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study does not require Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (MOH) review or approval as this is a case series. Informed consent to participate is not applicable and the study is done in accordance with the Declaration of Helsinki.

CONSENT FOR PUBLICATION

Not applicable

AVAILABILITY OF DATA AND MATERIALS

The results generated and analyzed during the current study will be available from the corresponding author upon reasonable request.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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AUTHORS' CONTRIBUTIONS

Wong Chyau Hong contributed to the drafting and revision of the manuscript. Irfan Mohamad was responsible for the review and editorial revisions. Chew Shiun Chuen contributed to the acquisition and provision of data. All authors read and approved the final version of the manuscript

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