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Case Report

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Diagnosis of a Neck Mass in the Emergency Department

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Abstract

Background: Patients are presenting to emergency departments with nonspecific signs and symptoms that can be associated with life-threatening conditions.

Methods: A 61-year-old patient presented with a left-sided neck mass that had rapidly increased in size. Ultrasonography revealed a 5x4 cm mass at levels IIa-III with reduced echogenicity and posterior enhancement. There were no B symptoms or other medical conditions. Computed Tomography (CT) showed a mass suspicious of malignant lymphoma.

Results: We resected the cystic structure and took tongue base biopsies. Histology revealed a neck cyst and poorly differentiated non-keratinizing squamous cell carcinoma in the cyst wall. Positron emission tomography with CT showed a mild elevation in glucose metabolism. There were no focal areas of residual malignancy or metastatic disease. No primary tumor was found.

Conclusion: Lesions with the morphology of a cystic mass can be malignant, especially in patients over 40 years. Cystic neck metastases are often p-16 positive.

Keywords: Central emergency department; Lateral neck cyst; Neck mass; Squamous cell carcinoma; p-16 positive

Introduction

Emergency care in the setting of a central emergency department has undergone a rapid development in recent years [1,2] and plays an increasingly important role both from the medical and the economic and health policy perspective. Rising numbers of patients from all age groups with a wide variety of signs and symptoms, complaints, diseases, and injury patterns are receiving care in emergency departments. Guided by the principles of general medicine, physicians must prioritize patients based on clinical needs and, if necessary, refer them to appropriate specialist care. Among the patients presenting to the emergency department are common otolaryngologic emergencies (tonsillitis, otitis media, epistaxis, etc.) but also patients with nonspecific symptoms who require a rapid medical assessment. Patients may present not only with trivial complaints but also with complex conditions. Those with serious conditions should be referred to a specialist with a view to ensuring the early initiation of appropriate diagnostic procedures and therapeutic measures.

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Case Report – Medical History and Clinical Findings

A 61-year-old male patient with a left-sided neck mass presented at night to the emergency department. He reported that the mass had rapidly increased in size since the previous day. He had consulted his general practitioner on the previous day, complaining of a sore throat, cough, runny nose, and mild difficulty swallowing.

A basic Ear, Nose and Throat (ENT) examination was unremarkable. An ultrasound scan revealed a (5 cm by 4 cm) mass on the left side at levels IIa-III with reduced echogenicity and posterior enhancement. These findings were suggestive of a malignancy, an abscess or an infected lateral neck cyst.

B symptoms were absent. Apart from left renal agenesis, the patient reported no other medical conditions.

Non-contrast-enhanced Computed Tomography (CT) of the soft tissues of the neck showed a mass on the left side at level IIa suspicious of malignant lymphoma (Figure 1). Clinically, a biopsy was clearly indicated. Additionally, a small hypovascular thyroid nodule was detected on the left side.

Since the patient's inflammatory parameters were normal and he had no shortness of breath during the night, the physician on duty in the central emergency department advised the patient to consult an otorhinolaryngologist soon.

The patient presented to the Department of Otolaryngology of our hospital. Our working diagnosis was an infected lateral neck cyst. We resected the cystic structure, which exuded a copious amount of creamy fluid when it was opened.

The surgical procedure that was performed at our department included:

1. Panendoscopy with excisional biopsies of the tongue base.

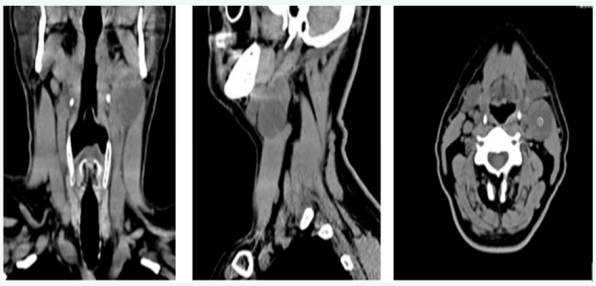

Figure 1 CT images of the soft tissues of the neck (coronal, axial and sagittal views).

Biopsies of the tonsils were not obtained since the patient had undergone tonsillectomy in childhood [3].

2. Removal of the left-sided neck mass.

A histological examination of the biopsy specimens revealed a lateral neck cyst and poorly differentiated non-keratinizing squamous cell carcinoma that had developed in the cyst wall.

In the presence of malignancy, Positron Emission Tomography with CT (PET/CT) was performed as part of the staging process and showed a mild elevation in glucose metabolism at the site of surgery as a result of a post-interventional increase in reactive processes (Figure 2).

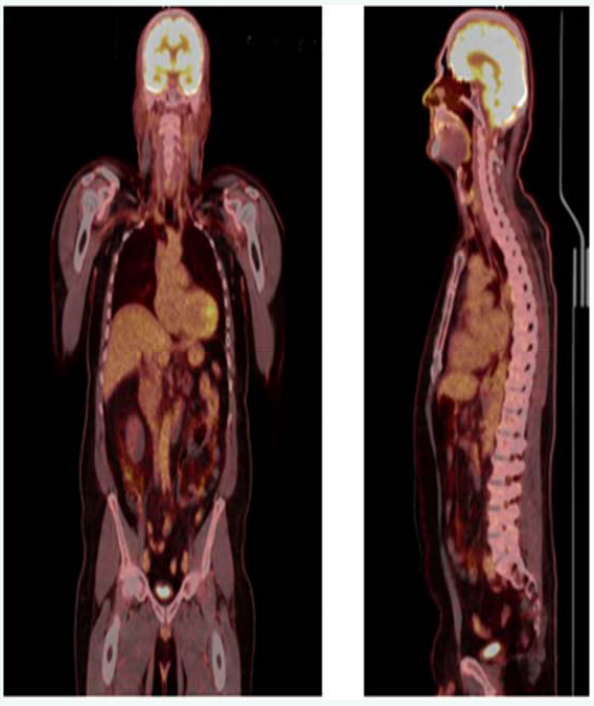

Figure 2 PET/CT coronal and sagittal images.

In addition, a nonspecific increase in glucose metabolism was detected at the posterior laryngeal wall without a morphological correlate.

There were no focal areas of glucose hypermetabolism to suggest residual malignancy or metastatic disease. Furthermore, there was no evidence of a primary tumor in the upper aerodigestive tract.

Ultimately, the histological findings (Figures 3,4) were consistent with a poorly differentiated non-keratinizing squamous cell carcinoma that had developed in the lining of a lateral neck cyst and had focally invaded the cyst wall.

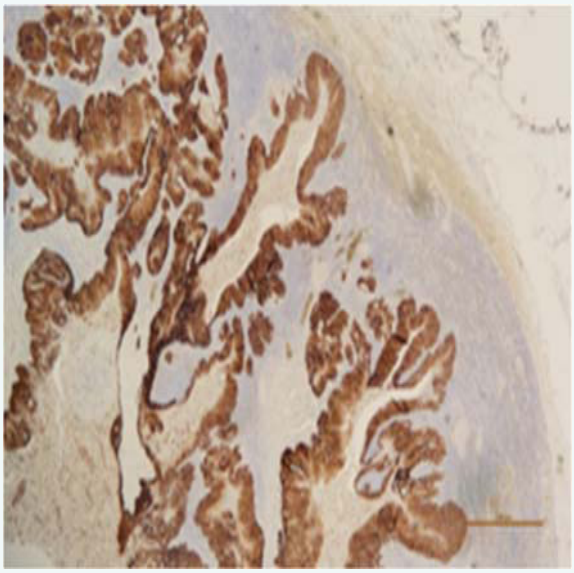

Figure 3 On immunohistochemical staining using CK5/14, tumor cells showed high expression levels.

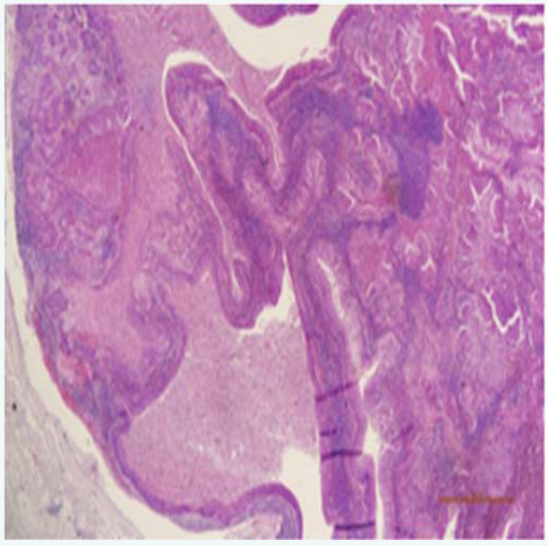

Figure 4 Tumor cells after Hematoxylin and Eosin (H&E) staining.

The excisional biopsies of the left-sided tongue base revealed lingual tonsil tissue and focal areas of metastasis from a solid carcinoma in the region of the lamina propria of the tongue base mucosa.

A molecular pathological examination showed that the specimens were positive for Human Papilloma Virus (HPC) high-risk types 66, 68, 73, and 82.

As a result of the histological findings, we performed another surgical procedure including re-resection in the region of the tongue base and modified radical neck dissection involving levels II-V. No specimen demonstrated malignancy.

The final pathological diagnosis was HPV-positive branchiogenic squamous cell carcinoma in a left-sided lateral neck cyst with metastasis of the carcinoma to the left tongue base. The circumscribed solid lesion was classified as metastatic carcinoma that had spread from a branchiogenic carcinoma via the hematogenous route or along the perineural sheath (of the hypoglossal nerve).

Clinically, oropharyngeal carcinoma with metastasis to a lateral neck cyst was considered as a differential diagnosis but was definitely ruled out by the pathologist on the basis of the presence of tumor tissue in the epithelial lining of the neck cyst.

Following the case discussion at a meeting of the head and neck tumor board, the patient received adjuvant radiochemotherapy.

In the case presented here, patient assessment in the emergency department revealed suspicious findings. Especially the imaging results and the relatively high age of the patient were unusual.

In our case, it cannot be definitively established whether the cystic mass had remained asymptomatic for many years, whether recurrent inflammatory conditions had been largely asymptomatic until they induced degeneration [4,5], or whether the cyst had undergone primary malignant transformation. Although malignant transformation of a lateral neck cyst is uncommon and is a matter of some debate cystic changes in lymph node metastases must be considered. There is, however, substantial evidence that cystic lymph node metastases in the neck commonly originate from HPV-positive carcinoma of Waldeyer's ring [6]. The presence of a creamy fluid during surgery is not a guiding sign since it can be the result of both infection and tumor necrosis [7].

Since metastases from HPV p-16 positive oropharyngeal carcinoma typically have a cystic appearance and affect young men, they can be mistaken for lateral neck cysts [8,9]. Malignancy should be primarily suspected in patients older than 40 years of age [10]. Midline neck cysts associated with branchiogenic carcinoma rarely undergo malignant degeneration. In the majority of cases, these cysts represent papillary thyroid carcinoma arising from ectopic thyroid tissue [11,12].

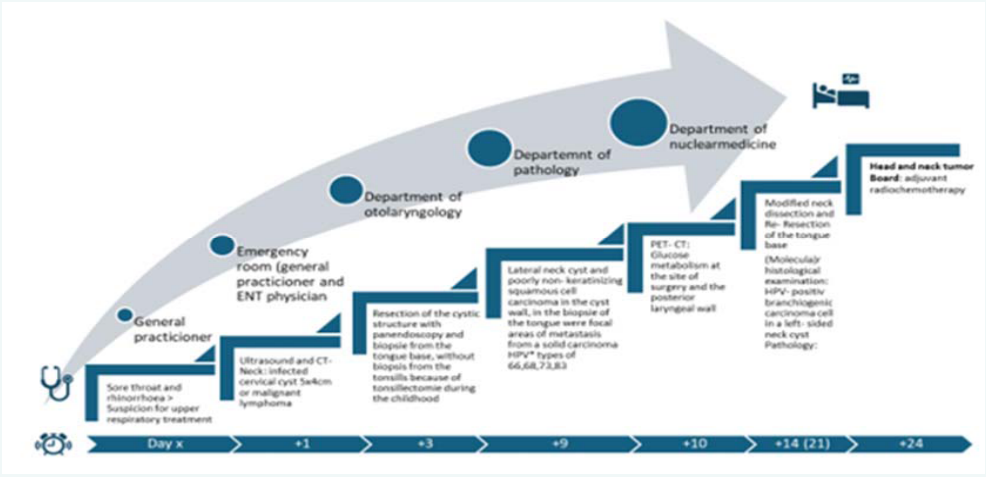

Figure 5 Treatment diagram of the patient.

Discussion

Lateral neck cysts are congenital branchiogenic malformations resulting from a cervical sinus that failed to obliterate. The underlying etiopathogenesis is not completely understood. Lateral neck cysts are assumed to be remnants of the second and third pharyngeal pouches/grooves. Another hypothesis on the cause of these cysts is that chronic inflammatory conditions lead to the spread of tonsillar tissue and cause cystic changes in lymph nodes. Given the absence of duct structures, the location, and the presence of lymphatic tissue, this appears likely. Men and women are almost equally affected by lateral neck cysts. Patients usually become symptomatic before 30 years of age. Ultrasound images demonstrate well-defined hypoechoic structures.

Conclusion

Lesions with the morphological features of a cystic mass on ultrasound and other radiological investigations can be malignant, especially in patients over 40years of age. Although about 90% of head and neck tumors are squamous cell carcinomas, the subentities are heterogeneous due to anatomical and molecular aspects. Neck metastases with a cystic appearance are often p-16 positive and histopathological assessment is recommended. The incidence of HPV- associated oropharyngeal carcinomas is increasing regardless of tobacco consumption. The prognosis of HPV- associated oropharyngeal carcinomas is significant better, meaning that prophylactic vaccination can prevent HPV-associated oropharyngeal carcinomas in the long term. No statements

can yet be made in the short and middle term due to the poor vaccination rate. In Germany the nationwide rate of complete HPV vaccination with two doses among 15-old girl was 47,2% (Portugal 96%- Bulgaria 7%) and among 15-years old boys 5,1% at the end of 2019. Vaccination was therefore carried out across the board in schools in parts of Germany in 2015. The evaluation is still pending [13].

Conflict of Interest

The authors declare that there are no conflicts of interest.

They assure that they have observed and complied with the data protection regulations and the requirements of the Declaration of Helsinki. The patient has provided a declaration of consent.

References

1. Gräff I, Glien P, von Contzen B, Bernhard M. Ersteinschätzung in der zentralen notaufnahme. Notfallmedizin up2date. 2018; 13: 271–289.
2. Altemeyer KH, Dirks B, Schindler K. Die zentrale notaufnahme als mittelpunkt zukünftiger notfallmedizin. Notfall Rettungsmed. 2007; 10: 325–328.
3. Boeckel G, Pouyiourou M, Claßen L, Bochtler T, Krämer A. Diagnostik und therapie von krebserkrankungen mit unbekanntem primärtumor (CUP-Syndrom). best practice onkologie. 2020; 15: 76–84.
4. Knöbber D, Lobeck H, Steinkamp HJ. [Does malignant lateral cervical cyst still exist?]. HNO. 1995; 43: 104–107.
5. Hosemann W, Wigand ME. [Are lateral neck cysts true derivatives of cervical lymph nodes?]. HNO. 1988; 36: 140–146.
6. Goldenberg D, Sciubba J, Koch WM. Cystic metastasis from head and neck squamous cell cancer: a distinct disease variant?. Head Neck. 2006; 28: 633–638.
7. Pein M, Kösling S, Bensch C, Plontke S, Kisser U. Ein Bild, zwei verschiedene Diagnosen. HNO. 2022; 70: 911-914.
8. Pynnonen MA, Gillespie MB, Roman B, Rosenfeld RM, Tunkel DE, Bontempo L, et al. Clinical practice guideline: evaluation of the neck mass in adults. Otolaryngol Head Neck. 2017; 157: S1-S30.
9. Strassen U, Hofauer B, Matsuba Y, Becker K, Mansour N, Knopf A. Bronchogenic cancer: It still exists. Laryngoscope. 2016; 126: 638–642.
10. Gourin CG, Johnson JT. Incidence of unsuspected metastases in lateral cervical cysts. Laryngoscope. 2000; 110: 1637–1641.
11. Karal A, Capraro J, Metternich F, Müller M. Verdacht auf seltene Manifestation einer medianen und lateralen Halszyste – Diagnostik und therapeutisches Vorgehen. HNO. 2021; 69: 58–61.
12. Gülicher D, Hoffmann J, Hahn U, Kröber SM, Reinert S. Zystische Halslymphknotenmetastasen als Hinweis auf ein okkultes Tonsillenkarzinom. Mund Kiefer GesichtsChir. 2002; 6: 191–196.
13. Schulimpfprogramme als Lösung zur Steigerung der HPV-Impfquoten in Deutschland? Entwicklung der Impfquoten in einer hessischen Modellregion mit Schulimpfprogramm. Epidemiologisches Bulletin. 2022.