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Case Report

An Unusual Case of Lymphadenophaty of The Retropharyngeal Space in Recurrent Maxillary Sinus Carcinoma: Case Report

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Abstract
Retropharyngeal lymph nodes (RPLNs), particularly the lateral group known as Rouvière's nodes, represent an uncommon but clinically significant pathway for metastatic dissemination in head and neck malignancies. Their deep anatomical location, limited clinical accessibility, and exclusion from standard neck dissection procedures make their assessment challenging. Although frequently associated with nasopharyngeal and oropharyngeal carcinomas, metastatic involvement secondary to maxillary sinus carcinoma is rare. We report the case of a 72-year-old male with a history of squamous cell carcinoma of the maxillary sinus previously treated with definitive radiotherapy and concurrent chemotherapy.

Keywords: *Retropharyngeal lymph nodes, Rouviere´s node, metastasis neck, sinus maxillary, parapharyngeal space.*

INTRODUCTION

The retropharyngeal space is a narrow, midline, virtually potential space situated between the prevertebral fascia posteriorly and the buccopharyngeal fascia anteriorly.

Laterally, the pharyngoprevertebral fascia —extending from the buccopharyngeal fascia to the prevertebral fascia— theoretically separate it from the lateral pharyngeal space. These partitions are thin and do not act as a barrier to the spread of pathological processes. Its lateral boundary is effectively defined by the medial border of the internal carotid artery.

Inferiorly, the space is continuous with the retrovisceral space of the neck, which descends into the posterior mediastinum as far as the T3–T4 level. It contains loose connective tissue, lymphatic tissue, the ascending pharyngeal artery, and venous plexuses.

Theses nodes are largest in children, much smaller in adults, but seldom entirely absent. As one ages, the lateral retropharyngeal lymph nodes may atrophy, such that they are sometimes absent in adults—though only on one side. Complete absence of the lateral retropharyngeal lymph nodes is rare (1, 17).

According to Mascagni (1,3), describes deep lymphatic vessels of the head that drain into nodes situated on the medial side of the internal carotid artery, near its entry into the carotid canal. These are indeed the nodes known today as the lateral retropharyngeal nodes (1).

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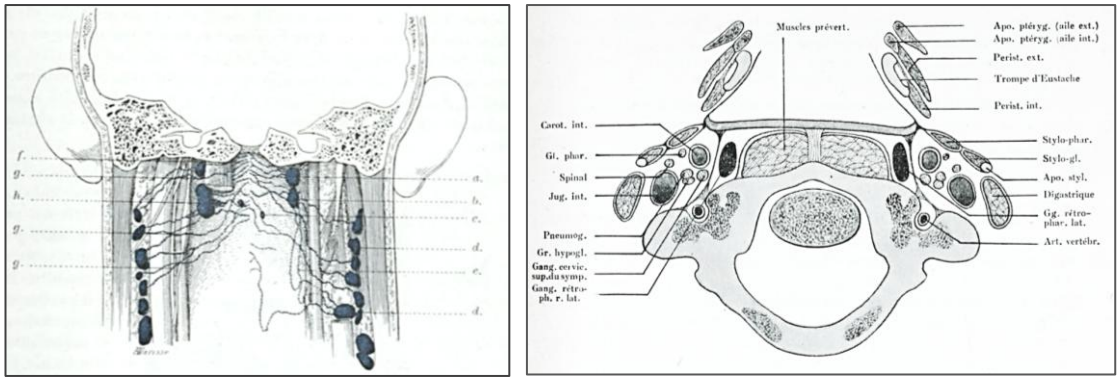


FIG. 1.- superior image: posterior view of the retropharyngeal nodes (4). Inferior image: coronal view of the neurovascular relationships of the retropharyngeal space (1,2).

The retropharyngeal lymph nodes (RPLN) lie within a fat pad. Following Most (1900) (1,4), we can distinguish the lateral and medial retropharyngeal nodes:

The lateral retropharyngeal lymph nodes are located between the carotid artery and the prevertebral muscles. They are most prominent anterior to the arch of C1 but can be seen as high as the level of the soft palate. The more superiorly located nodes, situated anterior to the atlas, are known as Rouvière's nodes (1, 5).

Although eponyms have fallen out of use, we refer to this one because it appears in numerous articles in the literature. The lateral retropharyngeal lymph nodes it is also known as "Rouvière's node", appears to have been coined following its publication in English in 1938, due to a lack of awareness of earlier publications by other authors in another language or misinterpretation of the translation. It was also known as Gillette's nodes -1867-).

The relation of the lateral retropharyngeal lymph nodes is (1,4, 17):

- Anteriorly, with the posterior wall of the pharynx; at the level of the atlas,
- Laterally, the internal carotid artery fascia and therefore near to the ascending pharyngeal artery;
- Posteriorly, the prevertebral fascia and the cervical sympathetic trunk and ganglion, which separates them from the lateral masses of the atlas;
- Medially, they are nearly 2 cms. distant from the midline.
- The skull base is superiorly and downwards the space continues to the level of vertebra C3 at its caudal extent.

The number of lateral retropharyngeal lymphatics nodes ranges from 1 to 3, and they may be present bilaterally or unilaterally (1,4,17).

Medial lymph nodes are also some small, inconstant median retropharyngeal nodes. They are more common in children and tend to be unilateral at the C2–C3 level. lie below the lateral nodes and are subclassified as upper and lower (or inferior). These lymph nodes are very small and are rarely present in adults.

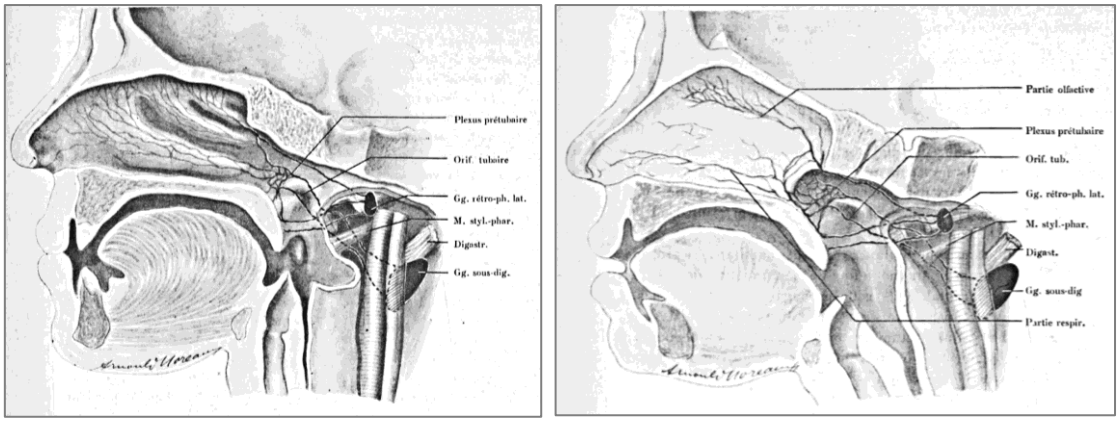
There are two major groups of collecting lymph vessels. One runs along the outside of the lateral pharyngeal wall, and the other is more posterior. The collecting lymph vessel on the lateral side of the wall divides several times and then crosses over the external carotid artery medially and the internal carotid artery laterally, before finally reaching multiple first-tier nodes: the lateral pharyngeal node, the subdigastric node and the third and fifth nodes of the retropharyngeal group.

The retropharyngeal lymph nodes form part of the deep lymphatic drainage system of the head and neck. They receive lymphatic drainage from structures including:

(1) The pharynx (buccal and nasal), soft palate and middle ear- corresponding in a general way to regions supplied by arteries of the pharynx, the soft palate being embryologically developed from muscles of the pharynx;
(2) The hard palate (often), nasal fossa, and some ethmoidal cells-not corresponding to blood supply. Efferent from retropharyngeal nodes go to nodes on the carotid artery.

Their efferent lymphatic vessels ultimately communicate with the upper deep cervical lymph nodes, particularly those along the internal jugular chain.

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Lymphatic drainage of the lateral wall of the nasal cavities. Lymphatic drainage of the medial wall of the nasal cavities (1).

Local recurrence may have an anatomical base. The abundance of avalvular lymph capillaries on the wall of the nasal fossa and the nasopharynx reaches multiple first-tier lymph nodes by passing three precollecting lymph vessels and two groups of collecting vessels. Meanwhile, there are numerous bypassing connections between nodes and pathways permitting cells to take alternative pathways, particularly if the main path is blocked.

The latter originate from a primary lesion—which is rare in these spaces—or, more frequently, via direct extension from adjacent regions or through metastasis. Invasion of these spaces by contiguity can occur from a malignant tumor of the nasopharynx, oropharynx, mandible, maxilla, oral cavity, or parotid gland.

Metastatic involvement of the retropharyngeal lymph node is most often secondary to pharyngeal carcinoma (whether of the nasopharynx, oropharynx, or hypopharynx), though it can also occur with thyroid carcinomas (6).

Clinically, involvement of the retropharyngeal nodes by tumor may be signaled by pain and stiffness in the neck. More ominous and characteristic, however, is an ipsilateral occipito-parietal headache described by the patient as pain located behind the eye. Also ominous is the presence of Horner's syndrome that results from tumor involvement of the cervical sympathetic trunk (7).

The retropharyngeal lymphatics nodes are not amenable to evaluation using manual palpation. Parapharyngeal space lesions are palpable as a neck lump usually only when the mass exceeds 2.5–3.0 cm. The use of transcervical fine needle aspiration cytology (FNAC) is widely recommended by many authors (9).

Consequently, the diagnosis of enlarged retropharyngeal lymphatics nodes in these patients is made on the basis of imaging examinations. Computed tomography (CT) or magnetic resonance imaging (MRI) can precisely determine the size and gross morphology of retropharyngeal lymphatics nodes. Fluorodeoxyglucose positron emission tomography (FDG PET)-CT may provide additional information over CT/MRI and, when used in combination with CT or MRI, may increase the diagnostic efficacy in the detection of RPLN metastases.

The tumors of the retropharyngeal and lateropharyngeal spaces account for approximately 0.5% of all head and neck tumors (11); 80% of these are benign, while 20% are malignant (9, 12). Metastases in the retropharyngeal lymph nodes account for 16% (17).

A literature review of 90 cases of tumors in the retropharyngeal and lateropharyngeal spaces, found a salivary origin in 27% of cases, neural tissue in 37%, miscellaneous malignant tumours (16%), neurogenic tumours (12%), miscellaneous benign tumours (10%), and malignant salivary gland tumours (10%) (8).

Another literature reviews a metanalysis conducted by Riffa *et al.* (9) showed 17 cases series fulfilled our inclusion criteria reports contained 1143 cases (1118 primary and 25 metastatic papapharyngeal space lesions. The 82% lesions were benign, 18% were malignant parapharyngeal space masses. The salivary gland tumours (prestyloid) were the most common primary lesions, with 45%, followed by neurogenic lesions (poststyloid), with 41%. The rest of the primary lesions comprised of a miscellaneous group with 12%, and 2% was lesions arose from lymph nodes.

Pathologic processes involving the retropharyngeal lymph nodes include inflammatory causes like bacterial or mycobacterial infections leading to retropharyngeal abscesses and neoplastic causes, either lymphoma or metastatic.

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Interestingly, metastases in the retropharyngeal lymphatic nodes were not found in patients whose neck was staged N0, whereas the prevalence of retropharyngeal lymphatic nodes metastases in patients whose neck was staged N+ was 30% in those with oropharyngeal tumor and 72% in those with hypopharyngeal tumor (10).

Malignant lymph nodes range in size from 7 to 30 mm and are easily detected by magnetic resonance imaging, especially on T2-weighted images (2).

However, in maxillary cancer, in rare cases, delayed metastasis to lymph nodes outside the typical dissection range, such as the buccinator or lateral retropharyngeal lymph nodes, may contribute to poor prognosis (13).

Overall, the commonest surgical approach used was the cervical approach, which was used in 328 cases (48%), cervical-parotid 27%, mandibulotomy 9%, parotid approach in 6% (9).

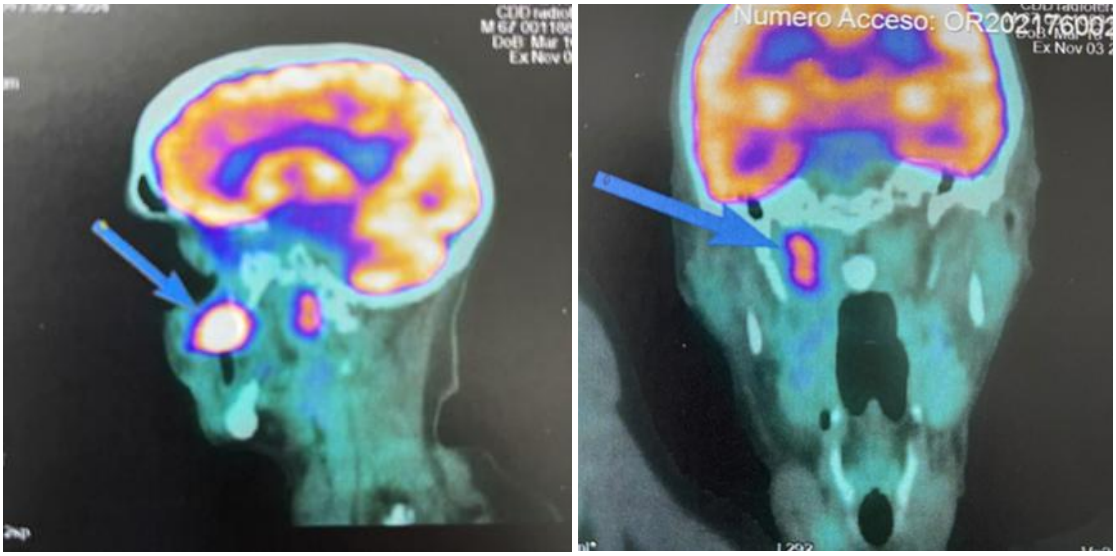
CASE PRESENTATION

We report a case of a 72-year-old male. The patient was previously treated with definitive radiation therapy with concurrent chemotherapy for squamous cell carcinoma of the maxillary sinus. The patient was a never-smoking, independent in activities of daily living, and had good nutritional status, without comorbidities.

Intaorally, without apparent pathology. Extraorally, cataracts are of most relevance, which are caused by fibrous metaplasia of the lens epithelium. Radiation-induced optic neuropathy presents as a painless, irreversible loss of vision. Functional impairment of the extraocular muscles and the orbicularis muscle; not enlarged lymph node was palpable in the neck region.

The patient presented during routine check-ups a right retropharyngeal PETCT-avid disease. He was brought to the operating room for resection, intraoperative radiation, and reconstruction.

Imaging revealed uptake in the maxillary sinus and a hypermetabolic mass with an SUV of 8.5 in the retropharyngeal region on a positron emission tomography (PET) scan; this signifies that the tissue is absorbing a large amount of radioactive sugar tracer, indicating moderate to high metabolic activity.



On pre-treatment imaging, the patient had a right hypermetabolic mass (SUV 8.5) showing increased fluorodeoxyglucose uptake in the right maxillary sinus (arrow left image) and a right retropharyngeal lymph node at the level of the atlas (left image).

The patient was brought to the operating room for resection through a total maxillectomy with extended orbital exenteration and transmaxillary approach to the retropharyngeal node.

A maxillectomy using a Weber-Fergusson incision (modification of the so-called incision Blandin-Gensoul) was performed (14), with a periorbital extension, after a total maxillectomy with ocular exenteration including the lower lid.

Intraoperatively, exposure of the retropharyngeal space revealed an abnormal lymph node, and the mass was encountered after incising the pharyngeal mucosa and the superior constrictor muscle; performing, then, the superselective node dissection.

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Incision is then made along the skin marking, full thickness. This procedure is continued circumferentially 360 degrees along the planned incision. Total maxillectomy do it with orbital exenteration with zygomatic body removal, The remnants of the ethmoids are carefully inspected. An external ethmoidectomy may safely be completed up to the cribriform plate.

A wide resection of the mass was performed while sparing the carotid artery. Reconstruction was performed using a temporalis muscle flap with a skin graft for the orbital cavity and a temporoparietal fascia flap for the palatal area.

After total maxillectomy, the nasopharynx and the retropharyngeal space is widely exposed for resection of tumor by pharyngectomy of the posterior wall.

This indicates that the anterolateral route to the nasopharynx with the maxillary swing approach offers a wide exposure of the whole nasopharynx and the paranasopharyngeal space for an oncological surgical procedure.

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Above: In such a case where generous amount of the eyelids has been sacrificed due to the tumor infiltration, different local flaps are used for reconstruction, in this case de temporoparietal fascia flap and temporalis muscle flap. In the middle: Specimen of total maxillectomy with orbital exenteration. Patient with the flap filling the orbital cavity previous to the skin graft. Below: Harvesting of a skin graft from the forearm. Skin graft placed over the temporalis muscle.

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DISCUSSION

The parapharyngeal space is an anatomically and functionally complex region of the neck. Tumors that develop in this region are made up of a diverse group of varying histopathologies, which can present a significant diagnostic dilemma for the treating physician.

The differential diagnosis in the retropharyngeal space must be established based on clinical findings and imaging. These differential diagnoses include infectious processes, metastases, lymphomas, granulomatous diseases, benign reactive nodules, and neuroma of the superior cervical sympathetic ganglion.

According to neck dissection classification (15), the lateral pharyngeal lymph nodes were included in the level II group, but the retropharyngeal nodes were excluded (16). This result suggests that for the treatment of patients with cancer in the nasal fossae or nasopharynx, multiple lymph nodes should be included (16).

The retropharyngeal lymphatics nodes are not routinely removed in the classical radical neck dissection or in other types of neck dissection, such as modified or selective neck dissections. Metastases to these nodes occur especially in advanced or recurrent primary tumors of the nasopharynx, oropharynx, hypopharynx, and cervical esophagus. Also, tumors of the paranasal sinuses, the middle ear, and Eustachian tube may metastasize to retropharyngeal lymphatics nodes. Thus, it is important to consider the retropharyngeal lymphatics nodes in the management of these upper aerodigestive tract mucosal neoplasms (17).

Various treatment modalities are employed for retropharyngeal lymph nodes, including external radiotherapy, transoral ultrasound-guided fine-needle aspiration for precise identification, chemoradiotherapy with selective intra-arterial infusion, and cetuximab therapy. These findings highlight the need for individualized therapeutic approaches tailored to each patient's specific characteristics and underlying pathological factors.

The significance of retropharyngeal lymph node metastases and their surgical management was first pointed out by Ballantyne in 1964. This indicates that the anterolateral route to the nasopharynx with the maxillary swing approach offers a wide exposure of the whole nasopharynx and the paranasopharyngeal space for an oncological surgical procedure (18).

However, there is no data in the literature about the management of persistent or recurrent metastatic disease in the retropharyngeal lymphatics nodes (17).

CONCLUSION

Tumours of the parapharyngeal space are rare. Parapharyngeal space tumors are one of the most challenging head and neck tumors to diagnose because their symptoms are subtle.

Because of the difficulty in initially detecting parapharyngeal spaces tumors, imaging studies are essential for diagnosis. CT and MRI are useful tools for investigating the tumor–host interface, involvement of major neurovascular structures, glandular tissue, and the relationship to the craniofacial skeleton, including the skull base.

Recognition of its location and relationships is therefore essential for clinicians involved in otolaryngology, head and neck surgery, radiology, and oncology. Understanding Rouvière's node provides a useful anatomical framework for interpreting patterns of lymphatic spread and for planning appropriate diagnostic and surgical approaches.

Surgical management of parapharyngeal spaces tumors is challenging because of their deep location and relationship with nearby neurovascular structures.

The excision of tumors from the retropharyngeal and lateral pharyngeal spaces cannot be performed without a thorough understanding of the anatomy of these regions.

Appropriate use of the cervical and cervical-parotid approaches with or without a mandibulotomy can enable the surgeon to achieve these aims. Any error in assessing the tumor's anatomical relationship to the vital structures within these spaces will lead to the selection of an inappropriate surgical approach.

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