CASE REPORT

Parapharyngeal Lipoma Extending to Skull Base: A Case Report and Review of the Literature

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ABSTRACT

Lipomas in the head and neck region usually occur in the immediate subcutaneous tissue. They are extremely rare in the parapharyngeal space. A rare case of a right parapharyngeal space lipoma extending to skull base in an 18-year-old male is reported. The literature is reviewed and the characteristics of disease are discussed.

KEYWORDS: Parapharyngeal space, lipoma

Tumors of the parapharyngeal space (PPS) are rare, composing only 0.5% of head and neck neoplasms.¹ A wide variety of histological types can occur in the PPS,² but neoplasms in this area most often involve the salivary glands. Neurogenic tumors are less common,³ and lipomas involving this space are extremely rare.⁴

The anatomic characteristics of the PPS make clinical examination of this area a difficult and unreliable method for assessing these tumors.⁵ Recently, improved preoperative evaluation techniques, including the use of computed tomography (CT), magnetic resonance imaging (MRI), and fine-needle aspiration, have enabled a more accurate assessment of these tumors and a rational approach to their management.³ Several surgical approaches

are available for the management of PPS masses. The choice of approach is based on the location, size, vascularity, and malignant potential of the tumor.⁶

We present an 18-year-old male with a large parapharyngeal lipoma that extended to the skull base. The literature is reviewed and the characteristics of the disease are discussed.

ILLUSTRATIVE CASE

An 18-year-old male presented with a progressive, painless swelling on the right side of his upper neck. The swelling had first been noted 2 years previously.

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The patient also complained of some difficulty in swallowing but no dyspnea. A physical examination of the patient revealed no other abnormalities.

A full blood count and erythrocyte sedimentation rate were within normal parameters. Chest radiography showed no abnormalities. A throat examination revealed the right pharyngeal wall and uvula to be deviated to the left. CT showed a low-density mass in the right poststyloid parapharyngeal space extending superiorly to the base of skull, consistent with a mass of adipose tissue origin. No evidence of lymphadenopathy was seen (Fig. 1).

The patient underwent excision of the parapharyngeal mass under general anesthesia via a transcervical approach. A large fatty tumor was found extending into the PPS, inferior to the level of the hyoid bone, superior to the base of the skull, and anterior to the submandibular gland. The mass was easily excised by a combination of blunt and sharp dissection from the neurovascular structures. Histopathology confirmed it to be a lipoma. The patient made an uneventful recovery. One year after

surgery, he showed no evidence of a recurrence (Fig. 2).

DISCUSSION

The PPS is often described as an inverted pyramid with its base at the skull base and its apex at the greater cornu of the hyoid bone.⁷ The styloid process and its muscles divide the space into two compartments, a prestyloid space and poststyloid space.² The prestyloid compartment is occupied by the deep lobe of the parotid gland; the pterygoid muscles; the mandible; the internal maxillary artery; and the inferior alveolar, lingual, and auriculotemporal nerves. The poststyloid compartment contains the internal jugular vein, the internal carotid artery, cranial nerves IX through XII, the cervical sympathetic chain, and lymph nodes.⁸

Neoplasms of the PPS are relatively rare, accounting for less than 1% of tumors of the head and neck. Most are benign.⁹ Work and Hybels

Figure 1 (A) Coronal CT scan shows a low density mass (arrows) in the right parapharyngeal space. (B) An axial CT scan shows a low-density mass (arrows) in the right parapharyngeal space extending up to the base of the skull.

Figure 2 Postoperative (A) coronal and (B) axial CT scans of the operative site.

found that 50% of PPS tumors were of salivary gland origin, 30% were neurogenic, and 20% were miscellaneous.¹⁰ Lipomas involving this space are extremely rare.⁴

Lipomas are undeniably among the most frequently encountered benign mesenchymal tumors. They can arise from adipose tissue anywhere in the body.¹¹ They can occur as single or multiple lesions and may occupy a superficial or deep-seated location.¹² Lipomas consist of adipose tissue cells separated by fibrous trabeculae and circumscribed by a delicate fibrous capsule.¹³ Although about 13% of lipomas occur in the head and neck, most are found in subcutaneous tissues. These tumors compose only 1 or 2% of all PPS tumors in reported series.^{6,14}

The unique characteristic of tumors of the PPS is that they all present in a similar fashion despite their various origins. Most of these lesions have a slow, insidious growth and are clinically asymptomatic.⁸ Symptoms appear only when the mass is large and are related to compression of surrounding structures. Symptoms include neck mass, dysphagia, pharyngeal mass, lower cranial nerve palsy, conductive hearing loss, and trismus.¹⁵

The presence of pain, trismus, or a neurological deficit is suggestive of malignancy.^{1,3} Often solitary, lipomas are asymptomatic except for cosmetic or obstructive effects. Pain is unusual and depends on the amount of pressure the mass exerts on surrounding tissues.¹¹

Clinically, it is difficult to access the PPS, and imaging is a vital part of the evaluation of these patients. The main objectives of imaging are to determine the extent of the lesion, to assess its respectability, to delineate its relationship to the carotid artery system and skull base, or to define its intracranial involvement. CT, MRI, and angiography have been useful in determining the position and size of these tumors to assist in operative planning.²

The accuracy rate of CT is 75 to 90%.^{5,6} Most authors recommend MRI as the study of choice because its accuracy in delineating a PPS mass is 95%. MRI also provides information about the type of tumor involving the PPS,⁶ but CT and MRI can accurately identify the lipomatous nature of neoplasms because of their characteristic low attenuation.⁴ Angiography has been recommended

for the diagnosis and management of PPS tumors when carotid artery involvement is suspected. This modality also shows the vascularity of a PPS tumor.¹⁶ Preoperative carotid occlusion studies have been suggested to determine whether decreased blood flow through the carotid artery can be tolerated. This study is critical when malignant tumors involve the poststyloid compartment of the PPS or extensive vascular tumors surround the carotid artery at the level of the skull.¹⁷ Preoperative angiography with embolization of vascular tumors has been reported to be useful in minimizing bleeding and injury to adjacent cranial nerves.¹⁶

Treatment of lipomas is surgical. Most lipomas are well encapsulated and easily dissected from surrounding tissues. They recur locally in 5% of cases. If invasion is detected during dissection, liposarcoma should be considered in the differential diagnosis.¹²

Many surgical procedures have been described for the treatment of PPS lesions. The goal of parapharyngeal surgery is to obtain adequate tumor visualization to ensure complete tumor removal with preservation of the surrounding nerves and vessels and to control any hemorrhage.¹⁷ There are five surgical approaches to tumors of the PPS: the transoral, transcervical, transparotid, transcervical-transmandibular, and lateral skull base approaches. The choice of surgical approach depends on the location, size, vascularity, and malignant potential of the tumor.⁶

Many authors have recommended the transcervical approach as the best access route for removing PPS tumors.^{18–20} This approach provides direct access to the PPS, with adequate exposure of neurovascular structures. It can be used to access minor salivary gland tumors and other PPS lesions up to 8 cm.^{5,21,22} When tumors are larger than 8 cm or extend to the skull base, or when improved exposure of the neurovascular structures is needed, the combined transcervical-transmandibular approach is useful.^{5,21–23} Bass described the transparotid approach,¹⁸ which is often used to access deep lobe parotid tumors.⁶ In patients with extensive PPS tumors and extensions to the skull base, a lateral

skull base approach is used.^{5,24–26} This approach, which was described by Ugo Fisch,²⁶ is often necessary for lesions originating in the jugular foramen and extending into the PPS.²⁵

Deep parotid lobe lipomas (prestyloid PPS) and poststyloid PPS lipomas should be differentiated. If a tumor arises from the deep parotid lobe, the transparotid approach, which requires identifying the facial nerve branches, is appropriate. The transcervical approach provides good and safe exposure for excision of poststyloid tumors, as it did in our patient.

Few parapharyngeal surgical cases have been associated with complications.¹⁶ In general, most postoperative complications are associated with removal of neurogenic tumors and malignant lesions.¹⁷ Damage to the cranial nerve and sympathetic trunk is common. These structures are particularly vulnerable due to their proximity to or involvement with local disease. Therefore, cranial nerve injury remains an important concern in any PPS surgery.²⁷

REFERENCES

1. Stell PM, Mansfield AO, Stoney PJ. Surgical approaches to tumors of the parapharyngeal space. *Am J Otolaryngol* 1985;6:92–97
2. Allison RS, Waal VD, Snow GB. Parapharyngeal tumours: a review of 23 cases. *Clin Otolaryngol* 1989;14:199–203
3. Maran AG, Mackenzie IJ, Murray AM. The parapharyngeal space. *J Laryngol Otol* 1984;98:371–380
4. Scott RF, Collins MM, Wilson JA. Parapharyngeal lipoma. *J Laryngol Otol* 1999;113:935–937
5. Carrau RL, Myers EN, Johnson JT. Management of tumors arising in the parapharyngeal space. *Laryngoscope* 1990;100:583–589
6. Miller FR, Wanamaker JR, Lavertu P, Wood BG. Magnetic resonance imaging and the management of parapharyngeal space tumors. *Head Neck* 1996;18:67–77
7. Curtin HD. Separation of the masticator space from the parapharyngeal space. *Radiology* 1987;163:195–204
8. Shoss SM, Donovan DT, Alford BR. Tumors of the parapharyngeal space. *Arch Otolaryngol* 1985;111:753–757
9. Batsakis JG, Sniege N. Parapharyngeal and retropharyngeal space diseases. *Ann Otol Rhinol Laryngol* 1989;98:320–321

10. Work W, Hybels RL. A study of tumors of the parapharyngeal space. *Laryngoscope* 1974;84:1748–1755
11. Atsunobu T. Lipoma in the peri-tonsillar space. *J Laryngol Otol* 1994;108:693–695
12. Enzinger FM, Weiss SW. Benign lipomatous tumours. 3rd ed. St. Louis, MO: CV Mosby; 1995:381–430
13. Barnes L. Tumours and tumour-like lesions in head and neck. In: *Surgical Pathology of Head and Neck*. Vol. 1. New York: Marcel Dekker Inc; 1985:747–758
14. Pensak ML, Gluckman JL, Shumrick KA. Parapharyngeal space tumors: an algorithm for evaluation and management. *Laryngoscope* 1994;104:1170–1173
15. Myssiorek DJ, Silver CE, Valdes ME. Schwannoma of the cervical sympathetic chain. *J Laryngol Otol* 1988;102:962–965
16. Eisele DE, Netterville JL, Hoffman HT, Gantz BJ. Parapharyngeal space masses. *Head Neck* 1999;21:154–159
17. Olsen KD. Tumors and surgery of the parapharyngeal space. *Laryngoscope* 1994;104(suppl 63):S1–S28
18. Bass RM. Approaches to the diagnosis and treatment of tumors of the parapharyngeal space. *Head Neck Surg* 1982;4:281–289
19. Gullane PJ, Lampe HB, Slinger R. Erosive parapharyngeal space teratoma. *J Otolaryngol* 1986;15:317–321
20. Baker DC, Conley J. Surgical approach to retromandibular parotid tumors. *Ann Plast Surg* 1979;3:304–314
21. Fertilo A, Pesavanto G, Recher G, Nicolai P, Narne S, Polidoro F. Assessment and treatment of neurogenic and non-neurogenic tumors of the parapharyngeal space. *Head Neck Surg* 1984;7:32–43
22. Som PM, Biller HF, Lawson W. Tumors of the parapharyngeal space: preoperative evaluation, diagnosis and surgical approaches. *Ann Otol Rhinol Laryngol Suppl* 1981;90:3–15
23. Som PM, Sacher M, Stollman AL, Biller HF, Lawson W. Common tumors of the parapharyngeal space: refined imaging diagnosis. *Radiology* 1988;169:81–85
24. Olsen KD. Parapharyngeal space tumors. In: Gates GA, ed. *Current Therapy in Otolaryngology Head and Neck Surgery*. St Louis, MO: Mosby Year Book Inc; 1993:243–247
25. Maniglia AJ, Chandler JR, Goodwin WJ, Parker JC. Schwannomas of the parapharyngeal space and jugular foramen. *Laryngoscope* 1979;89:1405–1414
26. Fisch U. Infratemporal fossa approach to tumors of the temporal bone and base of the skull. *J Laryngol Otol* 1978;92:949–967
27. Malone JP, Agrawal A, Schuller DE. Safety and efficacy of transcervical resection of parapharyngeal space neoplasms. *Ann Otol Rhinol Laryngol* 2001;110:1093–1098

Commentary

Parapharyngeal tumors are relatively uncommon but can pose a challenge to diagnose and treat. The examination is essentially radiographic. Typically I rely on magnetic resonance imaging and angiography. If the mass is vascular (e.g., carotid body tumor), embolization is performed within 24 hours of resection. In multiple studies, embolization has significantly reduced intraoperative blood loss and the need for transfusion.

Multiple surgical approaches exist. The transcervical-transparotid approaches are usually sufficient. Certain adjuncts such as removing the submandibular gland or dividing the stylomandibular ligament enhance exposure. However, if exposure is still poor and access to control the vessels is compromised, the mandibular “swing” can be performed with a relatively low rate of morbidity. The transoral approach is only feasible for small tumors with the jugular vein or carotid vessels displaced laterally. This approach is seldom used.

Morbidity should be minimal. Excision of schwannomas and neurofibromas involving the cranial nerves may result in temporary or permanent paralysis. The most commonly injured nerve is the facial nerve, specifically, the marginal mandibular branch. It is usually injured by traction or when the skin flap is raised.

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