Original article

Parapharyngeal space tumors: a ten year experience at a tertiary care hospital

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ABSTRACT

Background: Paraphyrangeal space is a potential space around the pharynx. Most of the tumors of this space are benign. Surgery is the mainstay of treatment of these tumors. The aim of this study is to review our experience of management of these tumours and to revisit the surgical approaches used for their management.

Subjects and methods: This retrospective study included 15 patients who were managed at ENT Department Sir Ganga Ram Hospital/ Fatima Jinnah Medical College, Lahore over a period of 10 years from October 2007 to October 2017. Their diagnosis was made on detailed history, clinical examination and relevant investigations. There were 9 males and 6 females out of total 15 patients. Their age range was between 22 to 54 years with a mean age of 37 years. We used three approaches for excision. Transoral approach was used for smaller pleomorphic adenomas while other two approaches were employed for medium to large sized tumors. The hospital stay was between 5-8 days.

Results: Twelve cases proved to be pleomorphic adenoma while two cases were schawanoma and one was a case of lymphatic malformation. All these patients were treated surgically through different approaches. Two patients developed palatal paresis which recovered after one year. One patient had change of voice due Left vocal cord paresis which recovered after six months. Three patients developed small sized haematomas which were treated conservatively.

Conclusion: Most of the tumours of PPS are benign. Surgery is the preferred way of treating PPS tumours. Although trans-cervical is the most frequently used approach, small tumours of PPS can be removed transorally while for very large tumours transmandibular-oropharyngeal approach should be applied.

Keywords:
Parapharyngeal space tumors, Surgical approaches, Trans-oral, Transcervical, Transmandibular -Oropharyngeal

INTRODUCTION

Paraphyrangeal space is a potential space around the pharynx like an inverted pyramid extending from skull base to lesser cornu of hyoid bone. The styloid process and the structures attached to this process divide this space into a pre-styloid and a post-styloid compartment. Pre-styloid compartment mainly consists of loose fibro alveolar tissue and small islands of salivary gland tissues while the posterior part contains large vessels – Carotid sheath with its contents and 11th, 12th cranial nerves and sympathetic trunk. Para- pharyngeal tumors are rare accounting only for 0.5-1% of head and neck tumors. Most of these tumors, about 70-80%, are benign and they mostly arise from salivary glands[1] and some are neurogenic in origin. About 20% tumors are malignant.[2] The purpose of this study is to review our experience of management of these tumors and to revisit the surgical procedures used for their management. Due to the complexity of its anatomy and its deep location we need modern day imaging techniques like CT scan, MRI and sometimes angiography for their diagnosis along with history and physical examination. For pre-operative histological analysis of these tumors Fine Needle Aspiration (FNAC) is always advised. But due to presence of major vessels in this space and the vascular tumors related to them, FNAC should always be done by experienced person and under diagnostic imaging control.[3] Smaller sized PPS tumors less than 3 cm can be removed by transoral approach, while for larger tumors trans-cervical and trans-mandibular-oropharyngeal approaches are used.[4]

SUBJECTS AND METHODS

Permission from Ethical Review Committee from JFJMU was taken for this study. It was a retrospective study which included fifteen patients who presented with paraphyrangeal tumors in ENT Department of Sir Ganga Ram Hospital/ Fatima Jinnah Medical College, Lahore between Oct 2007 to October 2017 was conducted. We reviewed their clinical histopathological and radiographic features. Computed Tomography (CT scan) was done in all patients. MRI was performed in 8 patients while FNAC under imaging control was done

Competing interest: The authors have declared no competing interests exist.
Citation: Sarwar MM, Riaz M, Javaid W, Mumtaz S. Parapharyngeal space tumors: a ten year experience at a tertiary care hospital. J Fatima Jinnah Med Univ 2018; 12(4):152-155.

in all patients. They were broadly grouped into pre styloid and post styloid tumors depending upon their location in PPS. In twelve patients the tumour was prestyloid while in two patients the tumors were present in post-styloid compartment. In one patient the tumour was large (lymphatic malformation) and was occupying both pre-styloid and post-styloid areas. All patients were managed surgically. Three approaches were used – trans-oral, trans-cervical and transmandibular - oropharyngeal approach depending upon their size, location and relation to major vessels. Vanillylmandelic acid (VMA) and metanephrine analysis after 24 hours urine collection was done in suspected cases of paragangliomas. A specific preoperative diagnosis can be made in more than 80% of patients and a limited diagnosis virtually in all cases.

RESULTS

There were fifteen patients in this retrospective study, nine males and six females, and their age ranged between 22 to 54 years with a mean age of 37 years. Most of these patients belonged to lower middle class of society. They presented in OPD complaining of difficulty in swallowing and change of voice. Two patients had neck swelling in addition to the above symptoms. Duration of symptoms varied between 3 to 15 months. Examination revealed lateral oro-pharyngeal wall, tonsil and soft palate bulging forward and medially causing difficulty in swallowing. Two patients having massive tumors also complained of respiratory distress on and off. There were no nerve palsies. All these swellings were non-pulsatile. CT scan with contrast enhancement was performed in all patients to know the exact size and extent of tumors. Tumor size was small (1-3cm) in 4 patients, in 9 patients it was medium (3-5cm), and it was large (7.5-9cm) in two patients. There were twelve prestyloid tumors, two were present in post-styloid compartment while one was occupying both parts but primarily arising from prestyloid portion. MRI with gadolinium enhancement was done in eight patients for better tissue character and large sized tumors.

FNAC was performed under imaging control (CT scan, ultrasound) in 15 patients. CT scan of 12 tumors showed heterogeneous enhancement typical of pleomorphic adenomas. While in two patients the tumors were well-defined heterogeneous masses, in one patient the enhancement was relatively marked.

MRI with gadolinium revealed two well-defined, heterogeneous masses with predominantly hyperintense T2 weighted images and isointense T1 weighted images, suggesting neurogenic tumors. FNAC showed pleomorphic adenoma in 12 patients, while it was inconclusive in three patients. In 12 patients the histopathology revealed pleomorphic adenoma, two patients with post styloid compartment tumors proved to be neurilenomas on histopathology, while in one patient biopsy showed lymphatic malformation (Table 1). All these patients were managed surgically. We used three approaches. Transoral approach was applied in four patients with prestyloid tumors less than 3cm in size. In 7 patients transcervical approach was used and the size of the tumor in these patients was medium (4-6cm), while in other four patients with massive tumors (6-9cm) transmandibular-oropharyngeal approach was adopted (Figure 1). Out of these last four patients two were post styloid tumors while one was occupying both compartments of PPS. These patients were kept on follow up between 1-2 years. All these patients are alive and healthy. One patient did not return for follow up. Two patients developed palatal paresis which recovered after one year. One patient had change of voice due left vocal cord paresis which recovered after 6 months. Three patients developed small sized hematoma which was treated conservatively (Figure 2). The hospital stay was between 5-8 days.

Table 1. Frequency of parapharyngeal space tumors

Location	Histology	Frequency
Prestyloid compartment	Pleomorphic adenoma	12
Poststyloid compartment	Schawanoma	02
Both prestyloiad and poststyloid compartment	Lymphatic malformation	01

DISCUSSION

Paraphyrangeal space tumors are rare and comprise almost 0.5-1% of all head and neck tumors.[5] Most (70-80%) are benign and the most frequent origin is salivary and neurogenic.[6] Surgery is the mainstay of treatment of these tumors.[7,8] There are many surgical approaches used for excision of these tumors and the choice of approach depends upon certain factors like size of tumour, location, relationship to great vessels and suspicion of malignancy.[9,10] In our present study, transoral approach was used in four patients for tumors less than 3cm in size, without any morbidity. For Medium sized tumors less than 6cm transcervical approach was used in 7 patients while in 4 patients having large tumours more than 6cm transmindibular-oropharyngeal approach was preferred. These surgical approaches provided excellent visibility with wide

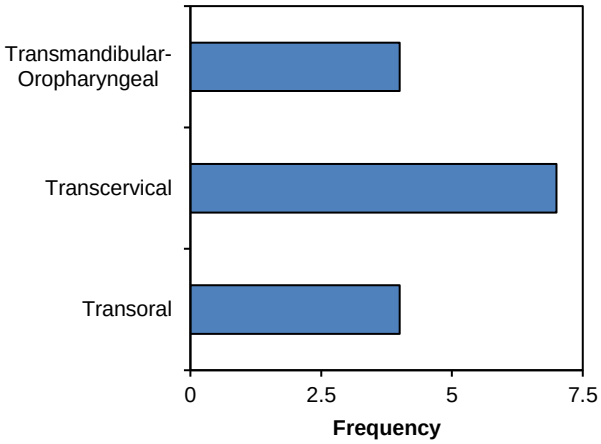

Figure 1. Frequency of Surgical approaches used for the treatment of parapharyngeal space tumors

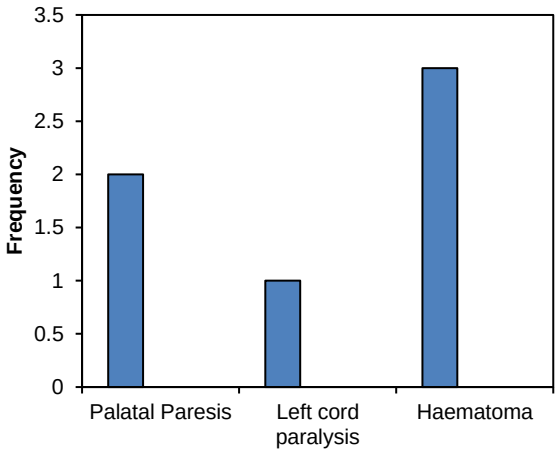

Figure 2. Frequency of post-surgery complications reported in the patients of parapharyngeal space tumors

surgical exposure to secure local neurovascular structures.[11] The surgical incision and the mandible healed well in all our cases without leaving any ugly scars. None of the above cases needed tracheostomy.[12-14].

In a ten years study review done in 2017 in China, out of a total number of 167 patients, 150 (90%) were benign and 17 (10%) were malignant. One hundred and forty four patients (84%) underwent complete resection through transcervical approach.[13] Twenty six patients (15%) had surgical complications and the most common (6%) being unilateral paralysis of vocal cords. Recurrence occurred in only 2 (1%) patients. The results of this study are similar to our present study results. In both studies the majority of PPS Tumours were benign (90% and 100%) and transcervical was the most frequently applied approach. However, the surgical complications were more (15%) in above mentioned study. This may be due to a larger study size (167 cases) having more ratio of malignant disease (15%) as compared with our present study where all cases were benign.

In another study done in Italy, 44 cases were reviewed retrospectively in 2014 for benign tumors over a period of ten years.[14] Out of these 44 cases 27 were in post-styloid area while 17 were in pre-styloid. Histologically, 16 cases were vagal paraganglioma, 13 were pleomorphic adenoma, and 10 cases proved schawanoma while remaining 5 were rare tumours. For surgery only transcervical approach was used in all cases. The results of this study differ from our present study as majority of the tumours in the study were post

styloid and neurogenic in origin. While in our study majority (12 out of 15) were prestyloid pleomorphic adenomas. However it resembles in one aspect that all the tumours were benign in both studies. We selected three types of surgical approaches i.e. transoral, transcervical and transmandibular-oropharyngeal while in the above mentioned study only transcervical approach was used in all 44 cases. Permanent cranial nerve paralysis occurred in 19 cases out of 44 while in our present study there were no permanent cranial nerve palsies. This difference is perhaps because majority of tumors in the above study were neurogenic in origin which have more chances of nerve paralysis post operatively. However, if instead of only transcervical approach different approaches were used according to size and site of tumour as was done in our present study, the results regarding nerve paralysis might be better.

In a retrospective review, 9 cases of PPS tumours were studied in Bangalore, India between 2010-2015. Different surgical approaches were adopted .In 4 patients tumour was resected through transoral approach, 3 patients underwent surgery through transmandibullar approach, in 1 case transoral and in another one transparotid approach was applied.[15] The results of this study resemble our present study results as far as different approaches for surgery of PPS tumors is concerned. More recently the endoscopic approach is being used in some centers in the world for surgery of PPS tumours as is the transoral robotic surgery (TORS).[16,17]

Hence it is evident from the above discussion that multiple approaches can be used for surgery of PPS Tumours. The choice of approach depends on the size of tumour, position of the tumour, suspicion of malignancy and relation to neurovascular bundle.

CONCLUSION

Most of the tumours of PPS are benign. Surgery is the preferred way of treating PPS tumours. The anatomy of PPS is quite complex so whatever the approach is employed it should be safe for the patients and provide maximum exposure. Although trans-cervical is the most frequently used approach[13], small tumours of PPS can be removed transorally while for very large tumours transmandibular-oropharyngeal approach should be applied.[18]

Acknowledgements: Special thanks to the record keeping department of SGRH, Lahore for providing us access to the record of the patients included in this study.

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