

Original Article

Surgical Outcome of Parapharyngeal Tumour

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Abstract:

Background: Parapharyngeal tumours are rare accounting for 0.5-1.5% of all head neck tumours. The anatomy of the Parapharyngeal space (PPS) is responsible for a wide variety of tumours arising from PPS.

Objective: Evaluation of the strategy for parapharyngeal tumor surgery based on preoperative symptoms, clinical signs, imaging investigations and histopathology.

Methodology: This retrospective study was carried out in the Department of Otolaryngology and Head Neck surgery in Bangabandhu Sheikh Mujib Medical University (BSMMU) included 32 patients were underwent surgery for primary parapharyngeal tumors between January 2018 and December 2019. Informed written consent was obtained from the patients prior to their inclusion in the study. In regard to histologic type there were 21 cases salivary gland origin tumors and 11 of neuro-genic tumors. The following data were evaluated preoperative symptoms, histological type, surgical approach and complications patients were evaluated following a laboratory investigations.

Results: The most common symptoms of these tumors were a neck swelling. Total of 18 tumors were located in the prestyloid and poststyloid space cases were located 10(31.25%) and 4(12.50%) in the pre and poststyloid. Majority 12(37.50%) was found pleomorphic adenoma of deep lobe of parotid gland followed by 6(18.75%) were schwannoma, 4(12.50%) were neurofibroma, 3(9.38%) were ectopic salivary gland tumor, 2(6.25%) were mucoepidermoid carcinoma, 2(6.25%) were adenocarcinoma. First bite syndrome and lower lip palsy were common post operative complications. Transcervical approach was the most often performed approach in this study (56.25%).

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Conclusion: *Parapharyngeal tumours most often derived from parotid gland. Most of them are non-malignant. Pleomorphic adenoma is the more common. Surgical resection being the main stay of treatment. Tumours of this complex anatomy call for careful preoperative planning and great skill for selecting the right approach and for management with minimal morbidity and recurrence.*

Key word: *Parapharyngeal tumours, pleomorphic adenoma, surgical treatment*

Introduction:

Parapharyngeal tumors are rare and a challenge to the surgeon as they are large and intimately related to carotids and lower cranial nerves at the time of presentation¹.

It is a triangular fat-filled compartment of the suprahyoid neck lateral to the pharynx. It is described as an inverted pyramid with the floor of the pyramid at the skull base and the apex at the level of the greater cornu of the hyoid bone². Parapharyngeal tumors are rare pathologies that comprise approximately 0.5% -1.5% of all head and neck tumors³. Eighty percent of them are benign and 20% are malignant. The most common lesions arise from the salivary glands followed by neurogenic tumors⁴.

Patients may present with locally advanced tumours which are intimately associated with important neurovascular structures like carotids, vagus & hypoglossal nerves. These tumours can extend higher into masticator space and can be intimately associated with facial nerve and skull base. They can compress the airway and present with stridor. Some of them can secrete vasoactive amines and can be part of a syndrome involving multiple sites. Some of these tumors may be associated with cranial nerve palsies at the time of presentation⁵. Surgery of these locally advanced tumors is challenging and requires expertise and experienced surgeon and anesthesiologist⁶. Though the outcome of treatment of benign parapharyngeal tumors is good with regard to survival, serious complications and morbidity can result due to treatment.

Methods:

This retrospective study was carried out in the department of otolaryngology and Head Neck surgery in BSMMU included 32 patients were underwent surgery for primary parapharyngeal tumors between January 2018 and December 2019. Informed written consent was obtained from the patients prior to their inclusion in the study. In regard to histologic type there were 21 cases salivary gland origin tumors and 11 of neuro-genic tumors. The following data were evaluated. Preoperative symptoms, histological type, surgical approach and complications patients were evaluated following a laboratory examination. Enhanced CT and MRI scans were used to confirm the location, size, extension of the tumor as a preoperative diagnosis. In particular the following aspects were evaluated. Tumour shape and the tumour margin, the association of the tumour location with major vasculature, surrounding tissue and the deep lobe of the parotid gland (DLPG). Whether the tumor localization was prestyloid salivary or neurogenic poststyloid. Preoperative imaging was also used to estimate the origin of the tumour, the extent of malignancy and tumor vascularity. For the examination of the histology of the tumour, fine needle aspiration cytology (FNAC) was performed in the majority of cases. In the case of malignancy, additional imaging examination was performed to inform the selection of a treatment plan. Where tumors exhibited the possibility of paraganglioma, MRA, CT angiography, Color Doppler study was performed to evaluate the vasculature

associated with the carotid artery. All patients enrolled in the study underwent surgical treatment. The plan for the surgical approach was selected according to the tumour location, histological findings, the relationship to anatomical structures and the suspicion of malignancy.

Results:

The common age group was found 41-60 which (68.75%) minimum age was 23 and maximum age was 67 years .The mean age was 45.67(±13.72) years (Table-I). Female was predominate 59.4% and male was 40.6% (Figure-1). Regarding sign and symptoms the most common symptoms of neurogenic tumors were a neck swelling (100%), sore-throat (34.38%), dysphagia (28.13%) and dysphonia (25.0%) and intraoral mass (18.75%)(Table-II). Preoperative CT or MRI imaging was used to evaluate the location of each tumour. A total of 18(56.25%) were located in the prestyloid space, poststyloid were 10(31.25%) and 4(12.50%) in the pre and poststyloid. The size of each tumor was measured with CT or MRI imaging. The most frequent range for tumor size was 3.0 4.0 mm (17 cases; 53.13%) followed by 4.0 5.0 mm (8 cases; 25.00%) (Table-III). Regarding pathological diagnosis, it was observed that majority 12(37.50%) was found pleomorphic adenoma of deep lobe of parotid gland followed by 6(18.75%) schwannoma, 4(12.50%) neurofibroma, 3(9.38%) ectopic salivary gland tumor, 2(6.25%) mucoepidermoid carcinoma, 2(6.25%) adenocarcinoma (Table-IV). First bite syndrome and lower lip palsy were common post operative complications (Table-V). Transcervical approach was the most often performed approach in this study 18(56.25%), cervical- transparotid 8(25%), cervical-transmandibular 5(15.63%) and trans-oral 1(3.13%) approaches were also used (Table-VI).

Table I :
Age distribution of the study population (n=32)

Age in years	Number	Percentage
20-30 yrs	03	9.38
31-40 yrs	05	15.63
41-50yrs	14	43.75
51-60 yrs	08	25.00
>60 yrs	02	6.25
Mean ±SD	45.67(±13.72)	Range 23-67 years

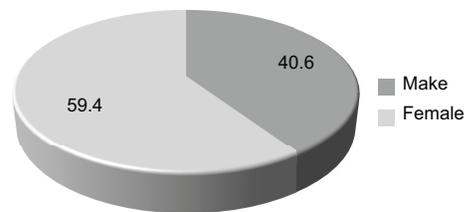


Figure 1: Sex distribution of the study patients

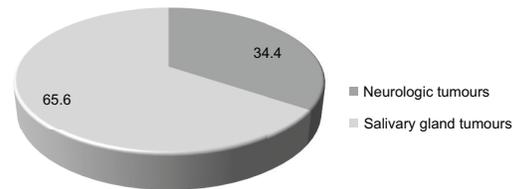


Figure 2: Distribution of patients according to tumour origin (n=32)

Table II :
Incidence of preoperative symptoms in parapharyngeal tumors (n=32)

Symptoms	Number	Percentage
Neck swelling	32	100.00
Sore-throat	11	34.38
Dysphagia	9	28.13
Dysphonia	8	25.00
Intraoral mass	6	18.75
Fullness of ear	5	15.63
Hearing impairment	3	9.38
Cervical pain	2	6.25
Pulsatile tinnitus	1	3.13
Cranial nerve palsy	1	3.13

Table III :
Tumor location and size measured by CT and MRI of the study patients (n=32)

	Number	Percentage
Tumor location		
• Prestyloid	18	56.25
• Poststyloid	10	31.25
• Prestyloid poststyloid	04	12.50
Size of the tumor		
• 2.0-3.0 cm	07	21.87
• 3.0-4.0 cm	17	53.13
• 4.0-5.0 cm	08	25.00

Table IV :
Final pathological diagnosis

Pathological diagnosis	Number	Percentage
Pleomorphic adenoma of deep lobe of parotid gland	12	37.50
Schwannoma	6	18.75
Neurofibroma	4	12.50
Ectopic salivary gland tumor	3	9.38
Mucoepidermoid carcinoma	2	6.25
Adenocarcinoma	2	6.25
Adenoid cystic carcinoma of deep lobe of parotid	2	6.25
Carotid body tumour	1	3.13

Table V :
Post operative complication of the study patient (n=32)

Complications	Number	Percentage
First bite syndrome	07	21.88
Lower lip palsy	05	15.63
Facial nerve palsy	02	6.25
Pharyngeal pain	01	3.13

Table VI :
Surgical Approaches of the study population

Surgical Approaches	Number	Percentage
Transcervical	18	56.25
Cervical- transparotid	08	25.00
Cervical- transmandibular	05	15.63
Trans-oral	01	3.13
Total	32	100

Discussion:

In this study observed that the common age group was found 41-60 which (68.75%) minimum age 23 and maximum age 67 years. The mean age was 45.67(\pm 13.72) years. Majority of the patients in our series were in the 4th decade of life. Other studies in literature also have reported maximum incidence of parapharyngeal tumors in the age group of 40 years to 47 years.⁷The mean age of patients treated for PPS tumors ranges from 42 to 53 years; however, some authors include patients under 18 years of age in the analysis. Their population mean age was 52 years^{6,8}.

In current study showed that female was predominate 59.4% and male 40.6%. Rzepakowska et al.³ reported there were 46 (67.6%) women and 22 (32.4%) men with a mean age of 52.2 years (age range 33–92 years). Regarding sign and symptoms the most common symptoms of neurogenic tumors were a neck swelling (100%), sore-throat (34.38%), dysphagia (28.13%) and dysphonia (25.0%) and intraoral mass (18.75%). Ijichi K and Murakami⁹ study reported that the most common symptoms of neurogenic tumors were a neck mass (37.5%), hoarseness (12.5%) and pharyngeal pain (12.5%). The most common symptoms of salivary gland tumors were the presence of a mass on the neck (30.8%) and abnormal sensation of the pharynx (15.4%).The most

frequent symptom in the cohort of the present study was a neck mass followed by pharyngeal mass; this is comparable with other studies¹⁰. Dysphasia and pain have also been reported to be common symptoms.^{10,11} Rzepakowska et al¹⁴. studied in 2018, Reported a feeling of an obstacle in the pharynx, hoarseness, speech disorders, tongue numbness and nasal congestion. Rzepakowska et al³. studied in 2020 symptoms on admission were present in 43 (63.2%) patients. Most of them had foreign body sensations in the throat (35/68), difficulty swallowing (33/68), a neck mass (29/68) or symptoms of Eustachian tube dysfunction (15/68). Thirty-two percent of patients (22/68) were asymptomatic and were diagnosed accidentally.

In this study showed that preoperative CT or MRI imaging was used to evaluate the location of each tumour. A total of 18(56.25%) were located in the prestyloid space, poststyloid were 10(31.25%) and 4(12.50%) in the pre and poststyloid. The size of each tumor was measured with CT or MRI imaging. The most frequent range for tumor size was 3.0 4.0 mm (17 cases; 53.13%) followed by 4.0 5.0 mm (8 cases; 25.00%). Gupta et al¹ reported that the average size of parapharyngeal space tumor was 6 cm \pm 3 cm. This was similar to most studies which reported average diameter of 5 cm.⁵ Few of our patients presented with tumors of massive size (10 cm \times 12 cm). In Rzepakowska et al.³ study the majority of tumors 39 (57.4%) were located in the prestyloid space. There were 11 (16.2%) postyloid tumors and the same number of tumors involving both localizations. They identified that neurogenic tumors were more likely to be located in the poststyloid area than other types of tumors. The concealed location of PPS tumors and their slow growth contribute to the rather large volume at diagnosis. In Rzepakowska et al.¹² study only

25% of the tumors were smaller than 4 cm and tumors larger than 5 cm accounted for 33.8%. Most authors present only the measures for the largest tumors in their series but do not analyze the cumulative influence of tumor size on the outcomes; for example Sun et al. found that the longest mean diameter of PPS tumors was 5.6 cm Chang et al. reported a largest tumor size of 6.8 cm among their 51 cases and Presutti et al. described an 8 cm diameter as the largest^{13,14}.

In present study regarding pathological diagnosis, it was observed that majority 12(37.50%) was found pleomorphic adenoma of deep lobe of parotid gland followed by 6(18.75%) were schwannoma, 4(12.50%) were neurofibroma, 3(9.38%) were ectopic salivary gland tumor, 2(6.25%) were mucoepidermoid carcinoma, 2(6.25%) were adenocarcinoma. In the Islam et al study reported salivary gland origin tumours were the most numerous (47%). Neurogenic tumours constituted 33% while chemodectomas 16%. Pleomorphic adenoma of the deep lobe of parotid gland and neurofibroma were the most numerous in the study¹⁵. Liu et al corroborated this observation reporting that the sympathetic and vagus nerves were the most common nerves of origin in head and neck schwannomas.¹⁶ A study by Tryggvason et al¹⁸ revealed that schwannomas arise in nerves with a sensory component and are associated with sensory ganglia. In addition, it was reported that the majority of sympathetic chain schwannomas are associated with the superior cervical ganglion¹⁷.

In this study showed that first bite syndrome and lower lip palsy were common post operative complications. In the Ijichi and Murakami study FNMB palsy typically occurred following surgery to remove tumors

of salivary origin, as the surgery was performed close to the mandible. The second most common complication in these previous studies was the presentation of FBS. FBS also occurred in the present study following prestyloid tumor surgery⁹.

In this study observed that transcervical approach was the most often performed approach in this study 18(56.25%), cervical-transparotid 8(25%), cervical-transmandibular 5(15.63%) and trans-oral 1(3.13%) approaches were also used. In Islam et al also reported similar observation they showed transcervical approach was the most often performed approach in this study (73%). transcervical-transparotid (10%), transcervical-transmandibular (13%) and trans-oral (4%) approaches were also used.

Conclusion:

Locally advanced parapharyngeal space tumours present with large tumours with close proximity to important neurovascular strictures and some of them are malignant. Surgery is challenging and the main modality of treatment. CT and MR imaging had a decisive meaning in the diagnostic process. Majority of the tumour can be accessed by cervical approach.

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