Bangladesh J Otorhinolaryngol 2011; 17(1): 36-41

Original Article

Clinical presentation and management of parapharyngeal space tumours

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Abstract:

Methods:Tumors originating in the parapharyngeal space are uncommon. During the period of January 1999 to December 2008. Among them 34 patients underwent surgery for parapharyngeal space tumors at the Department of Otolaryngology and Head Neck Surgery, Chittagong Medical College Hospital.

Results:Ninety one percent of the parapharyngeal space neoplasms were benign; 9% were malignant. Majority of the benign tumors were salivary gland origin followed by neurogenic tumors. The use of FNAC, computed tomography scan and ultrasound imaging are very useful to assess the location, size, vascularity, tissue origin and relation of parapharyngeal space tumors to surrounding anatomical structures.

Conclusion:This information was essential in planning surgical approaches and predicting the prognosis. Details of the management, morbidity, and outcome of these patients were presented.

***Key words**: Tumor, Parapharyngeal space.*

Introduction:

The Parapharyngeal spaces are potential spaces lie laterally on each side of the pharynx, filled with fat and areolar tissue and bounded by various condensations of fascia. the styloid process with it's muscles and condensations of fascia divide the parapharyngeal space into a prestyloid and a poststyloid compartment. The main structures contained in anterior compartment include the pterygoid and tensor palati muscles, fat and the deep lobe of parotid gland. The posterior compartment contains the carotid sheath with carotid artery and internal jugular vein, vagus nerve, sympathetic trunk, IXth, XIth and XIIth cranial nerve and major part of internal maxillary artery. The parapharyngeal space contains many lymph nodes which receive afferent vessels either directly or indirectly from nearly all sites of the head and neck. The common sources are nasopharynx, nose and paranasal sinuses, oropharynx, tongue base and parotid gland.[1]

Tumors arising in parapharyngeal space are relatively uncommon forming less than 5% of head and neck neoplasms. More than 80% tumors are benign.[2,3] Salivary gland tumors arising in deep lobe of parotid gland are the commonest in prestyloid compartment whereas neurogenic tumors are the commonest in poststyloid compartment.[1,4] Most of the tumors are slow growing in nature. Owing to the deep location, tumors do not present until they are quite large. Clinical

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presentations may vary from asymptomatic neck swelling to obstructive symptoms of airway and foodway. Due to complex location of these tumors, meticulous planning based on the results of imaging techniques, thorough knowledge regarding regional anatomy, skilled surgical and anaesthetic hands are utmost important factors in successful outcome.

Methods:

This is a prospective study carried out in the Department of Otolaryngology-Head & Neck Surgery, Chittagong Medical College Hospital in between January 1999 to December 2008. All the cases of both sexes were included in this study. In total 34 cases were available for study. Detailed history, thorough clinical examinations were done in every patient. Routine CBC, BT, CT, blood grouping, blood sugar, urea, X-ray chest P/A and soft tissue neck B/V, ECG, Ultrasonography, FNAC and CT scan of neck with contrast were done in every case. All patients underwent surgery under G/A. Two patient required preliminary tracheostomy for difficult intubation. Among 34 cases, 32 cases were explored externally in the neck and remaining 2 cases were explored per orally. All the tissues were submitted for histopathological diagnosis. Most of the cases recovered well in post operative period. Complications were noted in a small number of patients. No death was recorded in this series.

Results:

Total 34 patients were included in the study. Among them 21 were male and 13 were female. (Table I)

Table-I
Sex distribution (n-34)

Sex	Number	%	M:F
Male	21	61.8	1.6 : 1
Female	13	38.2	

Table-II
Age distribution (n-34)

Age range	Number	%
21 - 30 years	9	26.5%
31 - 40 years	13	38.2%
41 - 50 years	6	17.6%
51 – 60 years	4	11.8%
Above 60 years	2	5.9%

The age distribution was shown in Table II. The lowest age of the presentation was 23 years and the highest was 67 years. The mean±SD was 38±11.3 years. Most of the patients were within 40 years age range.

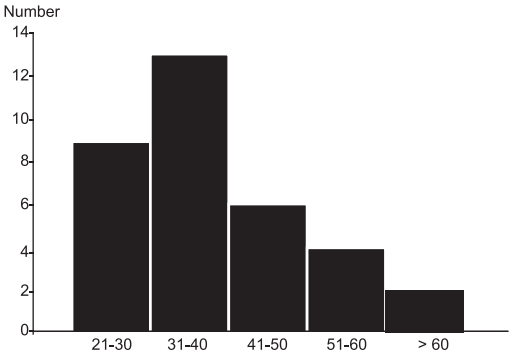

Figure-1 : *Bar chart showing age distribution*

The clinical presentations were summarized in table III.

Table-III
Clinical presentation (n-34)

Symptoms	Number
Neck swelling	34
Dysphagia	12
Heaviness in ear	10
Pain in swelling	9
Change of voice	8
Weight loss	5
Respiratory distress	2

According to the histopathlogy, 31 cases were benign and 3 were malignant. (Table IV)

Table-IV
Pattern of lesions (n-34)

Lesion	Number	%
Benign	31	91%
Pleomorphic adenoma-	21	
Neurofibroma-	8	
Lipoma-	2	
Malignant	3	9%
Adenocarcinoma-	2	
Metastatic sq cell ca-	1	

After surgery all cases were recovered well. 2 cases needed preliminary tracheostomy , which were decannulated 7days after surgery. Complications were noted in small number of patients.

No death was recorded in this series. (Table V)

Table-V
Complications of surgery

Complication	Number	%
Minor wound infection	4	11.8%
Hypoglossal nerve palsy	4	11.8%
Vocal cord palsy	2	5.9%
Horner's syndrome	2	5.9%

Discussion:

Primary parapharyngeal space neoplasms are relatively rare forming less than 5% of head neck tumours. Age of the patient at presentation is remarkably variable. It may be as low as 1 year and high as more than 90 years. But in children, parapharyngeal space tumours are extremely rare and malignant tumours specially soft tissue sarcomas are more common than the benign lesions.[5] Whereas in adults, most of the tumours are benign and most of them are pleomorphic adenoma followed by neurogenic tumours. This study also showed 91% tumours are benign and most of them are pleomorphic adenoma followed by neurofibroma which is similar to the findings of other studies.[2,3] Two types of salivary gland tumours occur in parapharyngeal space. The first type arises de novo from salivary gland tissue in the parapharyngeal space and has no connection with parotid gland. As the tumour grows it pushes a compressed layer of fibroadipose tissue ahead of itself. The second type arises within the deep lobe of parotid gland and extends to parapharyngeal space. This type has an intimate relationship with the parotid gland. Malignant salivary gland tumour is rare and that is either adenoid cystic carcinoma or adenocarcinoma. In this only 2 cases of adenocarcinoma of salivary origin were found. Neurogenic tumours are usually schwannoma or neurofibroma.[6,7] Schwannoma arises from Schwann cells covering the nerve. It is generally solitary, can readily be dissected from nerve of origin most often vagus nerve. Neurofibroma arises from perineurium. It may be solitary or multiple. It is virtually impossible to dissect the tumour without sacrificing the nerve of origin. In this study 8 neurogenic tumours are all neurofibroma. Other neurogenic tumours like malignant Schwannoma, carotid body tumour, paraganglioma and ganglioneuroma are rare findings.[8]

Lymph nodes are an important content of this space. They drain a wide area of head neck region. Secondary deposits occasionally found here as an isolated swelling without any apparent primary tumour elsewhere.[9] Here also 1 patient was a case of metastatic squamous cell carcinoma without a known primary tumour. Rarely a primary lymphoma without involvement of other neck nodes or solitary plasmacytoma is encountered.[1]

Most tumours of parapharyngeal space present as a slow growing mass in the neck and produce symptoms by exerting pressure over neighbouring structures. Sometimes the diagnosis is made incidentally during a routine head neck examination.[10] Hearing loss due to middle ear effusion caused by Eustachian tube obstruction is a frequent finding. Symptoms of a dull or neuralgic pain or chronic sore throat are common but not necessarily indicate malignancy. Motor nerve palsies like vagus, spinal accessory and hypoglossal nerve are caused by direct pressure on the nerve. Horner's syndrome and Vernet syndrome were also reported.[3,11] Sensory deficits of the mandibular nerve are caused by invasion of a malignant tumour. Dysphagia, speech defect, trismus and airway obstruction can be explained by mass effect.[1,12] In this series, neck swelling, dysphagia and heaviness in the ear were the commonest presentation. This finding has similarity with other studies.[2,3,10,11]

Once a primary parapharyngeal space tumour is diagnosed on clinical examination, an accurate radiological evaluation is indicated. A plain X-ray can show presence of a soft tissue mass or bone erosion but CT scan and MRI can accurately delineate the extent of tumour, degree and extent of bone erosion and relationship with carotid vessels. Enhancement indicates increased vascularization and most salivary gland tumours are relatively avascular and appear as hypodense soft tissue mass.[1] The most common enhancing tumour is schwannoma followed by paraganglioma. When there is significant contrast enhancement, carotid angiography is indicated to determine the degree of vascularity, to identify the feeding vessel and the displacement of carotid system. Ultrasonography is also helpful to see the extension, consistency and relationship with great vessels. Tumours arising in deep lobe of parotid gland displace the internal carotid artery posteromedially and neurogenic tumours displace it anteromedially.[13] Preoperative cross sectional images can predict origin of neurogenic tumours. Tumours arising in sympathetic chain displace both carotid and jugular vessels without separating them. Whereas vagal tumours separate carotid vessel from jugular vein.[14] Widening of carotid bifurcation is seen in carotid body tumours. Before surgery, every patient should have FNAC as it is very much helpful to predict the nature of tumour and allows the surgeon to plan for treatment. Aspiration may be done via transoral route when there is significant swelling inside.[15] In experienced hand, accuracy of FNAC is more than 80%. Guided FNA is more accurate and has lesser chance of having complications than blind aspiration.[16]

The treatment of tumours of the parapharyngeal space is mainly surgery. Radiotherapy and chemotherapy have limited role and work only in certain conditions.[1] The surgical approach to the space is transoral, transparotid, transcervical or combination. Exposure can be enhanced by mandibulotomy. Transoral approach has limited use and indicated only in small benign lesions less than 3 cm in size placed superomedially in the space.[3,17] Attempt of removal of larger tumour via this route may results rupture and seedling. Malignant lesions need wide exposure which is not possible transorally. Moreover, control of massive haemorrhage due to carotid vessels injury is impossible via this route. Deep lobe tumours of parotid are best dealt through transparotid approach. In large parotid tumours, superficial parotidectomy allows identification of facial nerve and performing osteotomy at the angle of mandible increases the exposure. If necessary, a midline

mandibulotomy may be added. For most tumours of poststyloid compartment the transcervical approach is adequate. Additional exposure can be obtained by removal of submandibular gland.[18] Transmandibular approach is reserved for cases where extensive exposure is needed in malignant or large vascular tumours.[2,3,4,19] In this series 32 cases were explored transcervically and 2 cases per orally with good outcome.

With good knowledge of anatomy and appropriate surgical approach, the post operative complications are kept to a minimum. The major problems are related to motor and sensory deficits due to removal or injury of nerves during operation. Facial nerve injury, vocal cord palsy, glossopharyngeal and hypoglossal nerve palsy, Horner's syndrome may occur during surgical procedures.[2,3,19] CVD rarely occurs due to manipulation of carotid arteries. Salivary fistula and Frey's syndrome are troublesome in small number of cases[1]. In this series minor wound infection and some neurological complications were noted in small number of patients but none were serious which were comparable to other studies.[2,3,10,11,17,18,19]

References:

1. Jones AS. Tumours of the parapharyngeal space. In: Gleeson M (editor). Scott-Brown's Otorhino-laryngology, Head and Neck surgery, 7th ed. Vol-2, London: Edward Arnold, 2008; 2522-38.
2. Hughes KV, Olsen KD, McCaffrey TV. Parapharyngeal space neoplasms. Head Neck 1995; 17(2): 124-30.
3. Ortiz KL, Aleman JEN, Garcia MG, Gomez AH. Primary parapharyngeal space tumours in a Mexican center. Otolaryngol Head Neck Surg 2005; 132(4): 587-91.
4. Hamza A, Fagan JJ, Weissman JL, Myers EN. Neurilemomas of the parapharyngeal space. Arch Otolaryngol Head Neck Surg 1997; 123(6): 622-6.
5. Starek I, Mihal V, Novak Z, Pospisilova D, Vomacka J, Vokurka J. Paediatric tumours of the parapharyngeal space. Three case report and a literature review. Int J Pediatr Otorhinolaryngol 2004; 68(5): 601-6.
6. Tandon DA, Bahadur S, Misra NK, Deka RC, Kapila K. Parapharyngeal neurofibromas. J Laryngol Otol 1992; 106(3): 243-6.
7. Leu YS, Chang KC. Extracranial Head and Neck Schwannomas: A review of 8 years experience. Acta Oto Laryngol 2002; 122(4): 435-7.
8. Al Otieschan AA, Saleem M, Manohar MB, Larson S, Atallah A. Malignant schwannoma of the parapharyngeal space. J Laryngol Otol 1998; 112(9): 883-7.
9. Raut V, Sinnathuray AR, McClean G, Brooker D. Metastatic breast carcinoma in the parapharyngeal space. J Laryngol Otol 2001;115(7): 750-2.
10. Allison RS, Van der Wall I, Snow GB. Parapharyngeal tumours: a review of 23 cases. Clin Otolaryngol Allied Sci 1989; 14(3): 199-203.
11. Olsen KD. Tumours and surgery of the parapharyngeal space. Laryngoscope 1994; 104(5): 1-28.
12. Moraitis D, Papakostas K, Karkanevatos A, Coast GJ, Jackson SR. Pleomorphic adenoma causing airway obstruction. J Laryngol Otol 2000; 114(5): 634-6.
13. Tom BM, Rao VM, Guglielmo F. Imaging of the parapharyngeal space: anatomy

and pathology. Crit Rev Diagn Imaging 1991; 31(3-4): 315-56.

14. David M et al. Parapharyngeal space Schwannomas- Preoperative imaging determination of the nerve of origin. Arch Otolaryngol Head Neck Surg 2007; 133(7): 662-7.

15. Oliai BR, Sheth S, Burroughs FH, Ali SZ. Parapharyngeal space tumours: a cytopathological study of 24 cases on fine needle aspiration. Diagn Cytopathol 2005; 32(1): 11-15.

16. Farrag TY et al. The role of pre-operative CT guided FNAB for parapharyngeal space tumours. Otolaryngol Head Neck Surg 2007; 136(3): 411-4.

17. Ducic Y, Oxford L, Pontius AT. Transoral approach to the superomedial parapharyngeal space. Otolaryngol head Neck Surg 2006; 134(3): 466-70.

18. Malone JP, Agarwal A, Schuller DE. Safety and efficacy of transcervical resection of parapharyngeal space neoplasms. Ann Otol Rhinol Laryngol 2001; 110: 1093-8.

19. Khafif A, Segev Y, Kaplan DM, Gil Z, Fliss DM. Surgical management of parapharyngeal space tumors: a 10-year review. Otolaryngol Head Neck Surg 2005; 132(3): 401-6.