Case Report

Surgical Management of Parapharyngeal Tumors - Our Experience

Avik Kumar Jana · Abhishek Jaswal · Biswajit Sikder · Utpal Jana · Tapan Kumar Nandi

Abstract Fifteen cases of parapharyngeal tumors treated surgically in ENT department of Calcutta National Medical College in last 2 years were included, 80% cases were of benign tumors, most common being schwannomas. Most important investigation was found to be CT scan. The study gives an overview regarding the surgical approach, based upon the extent and histology of the tumor and transcervical approach was found to be most efficient for all practical purpose.

Keywords Parapharyngeal tumors · Surgical management

Introduction

The tumors of parapharyngeal space present both delight as well as fright to every Otolaryngologist. Intricate position surrounded by vital structures makes the surgery very tricky whereas successful excision makes it a satisfactory experience. They constitute 1% of head and neck tumors with 80% being benign in nature.¹ Most common histological type reported is pleomorphic adenoma, although some authors have found paraganglioma to be the most common histological finding.^{1,2,5,6} Delayed presentation and presence of vital structures makes its removal an intricate one. Different authors have suggested different surgical approaches for successful surgical removal.^{1,2,3,4,7} Here we present our experience in the management of these tumors. A conservative transcervical approach was found to be feasible and effective

in most of the cases over an extensive radical one, which may be required in malignancies or skull base involvement.

Materials and methods

A study was carried out in the department of ENT, Calcutta National Medical College comprising of 15 cases of parapharyngeal swelling successfully managed surgically over a period of 2 years from January 2002 to February 2004. The patients were selected from ENT outdoor. After admission, they were subjected to routine investigations, CT scan (Fig. 8) and FNAC. Careful intra-oral and cervical examination including bimanual palpation was carried out to derive a rough impression of the extent of tumor. Neurological examination was done to exclude involvement of cranial nerves and sympathetic chain. Carotid angiography (Fig.10) and colour Doppler study was done in selected cases only.

The exact operative approach was determined according to the size, site, extent and preoperative diagnosis of the mass. Operative intervention was then carried out and the patients were followed up after 1 month, 3 months, 6 months, 1 year and then yearly.

Observation

In our study, the most common age group of presentation was 20-30 years- 5 cases (33.33%) (Fig. 1). In our study female preponderance was seen since 9 out of 15 cases were females(60%) and male were 6 cases (40%).

The most common presenting symptom in our study was neck swelling- 13 cases (86.66%) followed by intraoral swelling-9 cases (60%) (Fig.3),muffled voice-7 (46.66%), dysphagia-7 (46.66%), , Horner's syndrome -2 (13.33%), pain-2 (13.33%), cranial nerve palsies-2 cases (13.33%) and trismus-1(6.66%) (Table.1).

The most common histological variant that we came across in our study was Schwannoma-6 cases (40%), Salivary tumor-4 cases (26.66%) followed by Paraganglioma-2 cases(13.33%), Carotid body tumor-1 case (6.66%), Adenoid cystic carcinoma-1case (6.66%) and Metastatic carcinoma-1 case (6.66%).Out of these cases

Avik Kumar Jana¹ · Abhishek Jaswal² · Biswajit Sikder³ · Utpal Jana⁴ · Tapan Kumar Nandi⁵

1. Post Graduate
2. Post Graduate
3. RMO cum Clinical Tutor
4. Assistant Professor
5. Professor

Department of Otorhinolaryngology,
Calcutta National Medical College, Kolkata.

Avik Kumar Jana (✉)
Model Town, Balia,
Garia, Kol- 84 (W.B).

10 cases were seen in the prestyloid compartment and 5 cases were seen in the poststyloid compartment in a ratio of 2:1. (Table 2). Out of the 6 cases of schwannoma, 4 cases were prestyloid and 2 cases were poststyloid in origin.

Depending on the size and extent of the mass, various surgical approaches were selected. The most common surgical approach that we undertook was the transcervical approach- 9 cases (60%) (Fig.3) followed by midline mandibular-2 cases (13.33%) (Fig.8), transparotid- 2 cases (13.33%) and transpalatal approach- 1 case (6.66%). 1 case of carotid tumor was referred to cardiothoracic surgery for further management (Table 3).

The most common post-operative complication in our study was wound dehiscence-4 (26.66%), followed by facial nerve palsy-2 (13.33%) and trismus-2 (13.33%). Vagal nerve palsy was seen in 1 case (6.66%), whereas sympathetic chain involvement was seen in 1 case (6.66%) (Fig. 2).

Discussion

The tumors of parapharyngeal space constitute 1% of head and neck tumors with 80% being benign in nature.¹ Parapharyngeal space is an anatomically complex inverted triangular area encompassing various vital structures. Generally, these tumors tend to present late attaining impressive size. Meticulous intraoral and cervical examination including bimanual palpation gives the clinician a rough impression of the size of the tumor. Hence safe and effective removal demands a through surgical acumen and experience. Anatomically the space extends from the base of the skull to the greater cornu of the hyoid bone. Tonsillar fossa and superior constrictor form medial boundary whereas lateral boundary being formed by medial pterygoid, ramus of the mandible, deep lobe of parotid and posterior belly of digastric. Posterior boundary formed by vertebrae and paravertebral muscles. Styloid process divides the space into pre- styloid and post-styloid compartments. Most of the vital structures are present in the posterior compartment.^{1,2,5}

As most of the lesions are benign in nature and tend to present late, the most common age group of presentation as documented in various literatures is 4th to 5th

decade.^{1,2,5,8} Interestingly in our study, commonest age group of presentation was 2nd to 3rd decade. This may be due to majority of cases being schwannoma which are most commonly found in 20-35 years age group⁹.

Regarding sexual preponderance, we found that there was a slight female preponderance. Ratio was 1.5:1. This very well correlates with various literature.^{1,2,5,6,8}

Parapharyngeal mass can give rise to a host of various symptoms depending on the different types of adjacent structures affected. In our study, most common presenting symptom was neck swelling (86.66%) which is in accordance with various published literature (Table 1)^{2,3,4,5,6}. This may be explained by the fact that the only resilient wall of the parapharyngeal space is the medial wall. Rest of the walls is too rigid for the tumor mass to cause any significant

Table 1 Presenting symptoms of patients

Presenting symptoms	Number of cases	Percentage
Intraoral swelling	9	60.00
Muffled voice	7	46.66
Dysphagia	7	46.66
Neck swelling	13	86.66
Horner's syndrome	2	13.33
Pain	2	13.33
Cranial nerve palsy	2	13.33
Trismus	1	6.66

Table 2 Histology of tumors.

Histology	Number of cases	Percentage
Schwannoma	6	40.00
Salivary tumor	4	26.66
Paraganglioma	2	13.33
Carotid body tumor	1	6.66
Adenoid cystic carcinoma	1	6.66
Metastatic carcinoma	1	6.66

Table 3 Surgical approaches.

Surgical approach	Number of cases	Percentage
Transcervical	9	60.00
Transparotid	2	13.33
Midline mandibular	2	13.33
Transpalatal	1	6.66

distortion.¹ Although most of the cases that we came across were schwannoma which generally present with cervical swelling, their moderate size in most cases initially leads to intraoral bulging rather than cervical swelling. Trismus indicates infiltration of pterygoid muscles in malignancy or mechanical obstruction to coronoid process of mandible. It was seen only in 1 case (6.66%) of Adenoid cystic carcinoma in our study.

The second common symptoms were dysphagia (66.66%) and neck swelling (66.66%). Cranial nerve palsies was seen in 2 cases (13.2%). These occur due to involvement of the lower four cranial nerves in the poststyloid compartment.

Involvement of 9th, 10th cranial nerve is most common which gives rise to nasal regurgitation, nasal intonation, hoarseness and dysphonia. It may be due to mass compression effect but there presence usually signifies malignancies as seen in 2 cases in our study.¹⁰

CT scan with contrast is the gold standard investigation (Fig.9). It is done to find out the site of origin, size, extent and involvement of the surrounding vital structures especially the carotid sheath, lower four cranial nerve and sympathetic chain. MRI delineates soft tissue

Fig. 1 Age of Presentation

Fig. 2 Post-operative complications

density better but cost and availability limits its use. Differentiation between a parotid and non-parotid parapharyngeal mass is easily made out in the present generation CT scans. The CT generally shows a radiolucent line (zone of decreased attenuation) between the mass and deep lobe of parotid in tumors that are non-parotid in origin, but if mass is originating from the deep lobe, this line is absent (Fig- 8)^{1,2,3,5,6}.

Carotid angiography was done in one case of carotid body tumor in our study (fig. 10). It is usually done to look for carotid involvement in suspected cases of paragangliomas and carotid body tumor. Colour doppler should be done in selective cases where involvement of carotid is suspected. FNAC can be done routinely if the mass is approachable from outside. However, FNAC suffers the drawback of high proportion of false results. Open biopsy is generally avoided because it entails an extensive surgery to reach the proper site. MRI angiogram can supplement further information on carotid involvement and vascular pattern of the tumor mass in selective cases^{1,2}.

Patients were managed surgically by various approaches. Transcervical route was most commonly used- 9 cases (60%). As per existing literature, exposure in this approach is limited superiorly by the angle of the mandible and this approach is suitable in only small to moderate tumors (Fig.4). Tumors extending near the base of the skull cannot be managed by this due to insufficient exposure.^{1,2,3,4} However, in our

Fig.4 Per-operative photograph showing transcervical removal of a schwannoma.

Fig.5 Per-operative photograph showing transcervical removal of a schwannoma lying between internal and external carotid.

Fig.6 Per-operative photograph showing removal of mass through a transmandibular approach.

Fig.3 Clinical photograph showing intraoral swelling.

experience we found out that this was the most practical approach since not only small to moderate tumors but even large tumors can be approached with little difficulty in tumors that tend to be well encapsulated and can be dissected out bluntly without causing significant injury to nerves and great vessels (Fig.5).

Fig.7 CT scan showing well defined mass with central degeneration.

Fig.8 CT scan showing well defined homogeneous mass.

Fig.9 CT scan showing heterogeneous mass in left parapharyngeal space.

Fig.10 Carotid angiography showing feeding vessels of a carotid body tumor.

Second most common approach used was transparotid. Mandibulotomy can be combined if deemed necessary for better exposure. This is particularly suitable for salivary tumors arising from the deep lobe. Facial nerve poses a certain difficulty and injury is quite common even in experienced hands.^{1,2,8} Out of 2 patients approached by transparotid approach, 1 developed irreversible facial nerve palsy.

Third type of approach used was transmandibular. It provides excellent exposure for tumors involving base of skull and prestyloid compartment.^{1,3,7} This approach is also called median mandibulotomy or mandibular swing approach. Extensive resection and ligation of major vessels is very well feasible (Fig.6). Repositioning and wire fixation of mandible gives a satisfactory cosmetic outcome. Our experience says that this approach is an excellent one for extensive cases as it gives adequate exposure and complete tumor removal. But it is more time consuming and chances of complications like wound dehiscence and facial palsy is more adding to the morbidity of the patient.

Fourth type of approach is transpalatal approach. This was considered only for small benign tumors, which are extra parotid and non-vascular since exposure is very limited and adequate control of great vessels is quite impossible. Malignant and large tumors entails more extensive resection and therefore non-suitable for this approach.^{1,2,4}

The post operative complications following the surgical management were very less (Fig.2). Most common complication was the wound dehiscence seen in 4 cases (26.66%), 2 cases of voice paralysis were seen in cases of vagal paraganglioma. Both the patients were given the option of medialistion thyroplasty but only one opted for it.

Conclusion

From our study we conclude that not only small to moderate size parapharyngeal tumors but also large tumors specially benign well encapsulated ones are quite well managed by an adequate transcervical approach. Only malignancies or extensive involvement entails a more radical surgery like transmandibular or transparotid approach. Hence a conservative transcervical approach is feasible in most of the cases over an extensive radical one, which may be required in malignancies or skull base involvement.

Reference

1. Nayak.U.K, Choudary.S, Rao.J.J et.al.(2001): Surgical management of some unusual parapharyngeal space tumors. Indian Jr. Otolaryngo Head & Neck Surgery. 53(4):281-284.
2. Som P.M., Biller H.G., Lawson N.(1981): Tumors of parapharyngeal space: preoperative evaluation, diagnosis and surgical approaches. Annals Otol. Rhino. Laryngol. 90:3-15.
3. Kletzer G. R.,Smith P.G., Bigelow D.C. et.al. (1991): Management of high parapharyngeal space tumors. Ear Nose and Throat Journal; 70(8):639-647
4. Carrau R.L., Mays E.N., Johnson J.T.(June 1990): Management of tumors arising in parapharyngeal space. Laryngoscope;100(6):583-9
5. Stanley R.E.(Sept.1991): Parapharyngeal space tumors: Annals of the Academy of Medicine, Singapore; 20(5):589-96.
6. Biswas.S.,Mondal.P.,Saha.S. et.al.(2005): Parapharyngeal tumors: Indian Jr. Otolaryngo Head & Neck Surgery. Special issue 1:29-32.
7. Dubner S., Spiro R.H.(1991): Median mandibulotomy: A critical assessment. Head & Neck.13(5):389-93.
8. Work W.P.(1997): Parapharyngeal and salivary gland neoplasms. Otolaryngol. Clinics North Am. 10:421-26.
9. Varty S.P., K. Gautham, Samant S. et. al.(2005): Head and Neck schwannomas. Indian Jr. Otolaryngo Head & Neck Surgery. Special issue 1:81-84.
10. Pang K.P., Goh, C.H.K., Flow Ming Tan.(2002): Parapharyngeal space tumors: an 18 year review. The journal of Laryngology and Otology 116: 170-17.