Paraganglioma in supraglottic area: A rare case report

Dr. Shilpi Sahu¹, Dr. Ujwala Maheshwari², Dr. Ritika Jaiswal³

¹(Pathology department, Mahatma Gandhi Medical College ad Hospital, India)
²(Pathology department, Mahatma Gandhi Medical College ad Hospital, India)
³(Pathology department, Mahatma Gandhi Medical College ad Hospital, India)

Abstract: Paraganglioma of the larynx is a rare tumour that arises from paraganglion cells. These tumours are generally considered benign and have to be differentiated from other neuroendocrine tumors. Diagnosis relies mostly on histopathological examination followed by immunohistochemistry. Surgical excision generally confers complete cure of the tumor. We hereby present a case of laryngeal paraganglioma in a 50-year-old female, who presented with breathlessness, underwent total laryngectomy following a diagnostic micro-laryngeal biopsy, which was supported by immunohistochemistry.

Keywords- Immunohistochemistry; Larynx; Neuroendocrine; Paraganglioma

I. Introduction:

Paragangliomas of the head and neck are slow-growing, highly vascular tumours arising from groups of cervical parangagnlia. The most common cervical paraganglioma arises from the intercarotid parangagnlia and very rarely the laryngeal parangagnlia¹. Approximately 90% of tumours arising from the paraganglion system are in the adrenal gland. The remaining 10% arise from extra-adrenal sites with 85% arising in the abdomen, 12% in the thorax and the remaining 3% in the head and neck region.² The carotid body is the most frequently reported site of parangagnliomain the head and neck region. They are a subclass of neuroendocrine tumors of the larynx with a neural origin. The other subclass of neuroendocrine tumors are of epithelial origin and include typical carcinoids, atypical carcinoids and small cell neuroendocrine carcinoma³. Paragangliomas of the laryngopharynx are rare tumors that are of neuroendocrine origin and arise from the neural crest-derived cells of the parasympathetic nervous system. Since its first description in the literature in 1955, fewer than 80 such cases have been reported⁴. Patients present with hoarseness or dysphasia, and a submucosal mass evident on physical examination. The majority of these tumors arise in the supraglottic larynx, and 2% of these are malignant⁵. Since these tumors are from neural crest-derived cells, they usually appear adjacent to nerves, most commonly the superior laryngeal nerve or the recurrent laryngeal nerve⁶.

II. Case Report:

A 50-year-old woman presented with breathlessness since 1 year and hoarseness of voice and for six months. She was hypertensive. Fibreoptic laryngoscopy revealed a pink exophytic mass arising from epiglottis, right aryepiglottic fold and false cord compromising glottis fold and pushing the epiglottis to the left side. MRI was done which suggested a moderately enhancing vascular tumor of laryngopharynx in supraglottic region measuring 3.7 x 3.2 cms well above the vocal cord.

Laryngeal biopsy was sent. Microscopic examination of laryngeal biopsy revealed submucosal tumour composed of atypical cells arranged in nests and lobules separated by fibrovascularstroma. The tumour cells exhibited moderate pleomorphism with round to oval hyperchromatic nuclei. Cytoplasm was moderate to abundant, eosinophilic and granular. Congested capillaries and large areas of haemorrhage were noted. With these histopathologic findings, a provisional diagnosis of paraganglioma with the differential diagnosis of carcinoid tumor was made. Subsequently, the patient underwent an elective total laryngectomy and the specimen was sent for histopathological examination. Gross examination revealed a single grey brown soft to firm tissue mass measuring 3x2x1.8 cm, external surface congested. On cutting open solid grey brown heterogenous areas seen with few areas of congestion. Microscopic examination showed a subepithelial tumour composed of chief cells arranged in nests and characteristic zell-ballen pattern of variable sizes, separated by fibrovascularstroma (Fig. 1) and also in diffuse sheets in few areas separated by stag-horn vessels (hemangio-pericytomatos pattern). The chief cells were round to oval in shape with moderate to abundant amount of eosinophilic cytoplasm having nuclear pleomorphism with round to oval nuclei and granular to fine stippled chromatin (Fig 3). The sustentacular cells were located at the periphery of zellballen and had eosinophilic cytoplasm and angulated nuclei. Some cells showed bizarre nuclei and smudgy chromat. (Fig 4). Large areas of hemorrhage and congestion were noted. Lymphovascular and perineural invasion was not seen. The surgical margins were free of tumor. Special stains were done like Reticulin stain – showing the zell-ballen pattern (Fig 2).
Paraganglioma in supraglottic area: A rare case report

Immunohistochemistry for cytokeratin and S100 (Fig5a&b) was done in the tissue section which revealed S100 positivity for sustentacular cells and cytokeratin negativity. A final diagnosis of paraganglioma was made.

III. Discussion:
Paragangliomas of the laryngopharynx are rare tumors that are of neuroendocrine origin and arise from the neural crest-derived cells of the parasympathetic nervous system. Laryngeal paragangliomas are three times more common in women and have been described in patients from 5-83 years of age (median 44 years). The vast majority (82%) occur in the supraglottic larynx, presumably arising from the superior pair of laryngeal paraganglia, and present as a submucosal mass in the region of the aryepiglottic fold—false vocal cord. Only 15% occur in the subglottis and 3% in the glottis. The “Zellballen” pattern is not diagnostic of paraganglioma as there was no diagnostic of a paraganglioma may present subglottalomas have the highest incidence of these tumors occurring in the supraglottic area. Only 2 arising from the inferior paraganglia and 2 arising from the inferior paraganglia. The “Zellballen” pattern is not diagnostic of a paraganglioma as it may also exist in a variety of other tumors including typical and atypical carcinoid, malignant melanoma and medullary carcinoma of thyroid. Immunohistochemistry is helpful in establishing the correct diagnosis as the distinction between paraganglioma and atypical carcinoid neuroendocrine carcinoma may prove difficult on light microscopy. The presence of chromogranin positivity excludes non neuroendocrine neoplasms and the absence of keratin positivity and presence of S-100 protein-positivesustentacular cells tends to exclude carcinomas. In the present case, only a provisional diagnosis of paraganglioma could be made on histopathologic examination. However, with the help of immunohistochemistry (S100 positive and Cytokeratin negative) a definitive diagnosis of paraganglioma was possible before surgical excision was performed. Paragangliomas are generally benign tumors. The presence of vascular, capsular or perineural invasion does not necessarily indicate aggressive behavior. It is generally accepted that a paraganglioma is determined to be malignant only when metastasis is demonstrated. We consider the present case to be benign as there was no evidence of metastasis. The patient is however under regular follow-up to detect any recurrence/metastases at an early stage. The false cord area, while those arising in the inferior paraganglia may present subglottically, intratracheally or adjacent to the thyroid gland. There has been a report of 2S cases of laryngeal paraganglioma with 23 tumours occurring in the superior paraganglia and 2 arising from the inferior paraganglia. These patients, as did our patient, presented with a compromised airway and phonation abnormalities. However, haemoptysis, neck discomfort and a mass in the neck have also been reported. All the reported cases presented with a well-circumscribed submucosal laryngeal mass. Hence laryngeal paragangliomas should be considered in the differential diagnosis of all such masses. Surgical treatment of these tumours is indicated. Paragangliomas are radioresistant and the incidence of malignancy is high in laryngeal paragangliomas. Some authors have suggested that laryngeal paragangliomas have the highest incidence of malignancy in the extra-adrenal paraganglioma group. They reported that 24% of laryngeal paragangliomas followed a malignant course, with both local and distant metastases in the form of subcutaneous nodules. Our patient, and the majority of cases reported underwent partial laryngectomy, however regular follow up is essential to detect any recurrence/metastasis at an early stage.

IV. Conclusion:
Paraganglioma of larynx is rare. It has to be differentiated from other neuroendocrine tumors. The closest differential diagnosis for laryngeal paraganglioma is carcinoid tumor. Diagnosis is based on its characteristic histopathologic findings, supported by immunohistochemistry. Laryngopharyngeal paragangliomas are uncommon tumors that are conventionally treated with surgical resection for oncologic control. Close collaboration with an experienced pathologist is necessary to establish the diagnosis with immunohistochemical evaluation and electron microscopy to confirm the diagnosis. Surgical resection remains the standard of care for their treatment, although radiotherapy may be considered in selected patients. Although malignant paragangliomas of the larynx have been reported, they are rare and metastasis should raise the question of misdiagnosis.
**Figure legends : -**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>H &amp; E stained section (40 X) Showing subepithelial tumor composed of chief cells arranged in nests and characteristic zellballen pattern of variable sizes, separated by fibrovascularstroma.</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Reticulin stain (40 X) Showing the enhanced zell-ballen pattern</td>
</tr>
<tr>
<td>Figure 3</td>
<td>H &amp; E stained section (40 X) Showing round to oval chief cells with moderate to abundant amount of eosinophilic cytoplasm having nuclear pleomorphism with round to oval nuclei and stippled chromatin.</td>
</tr>
<tr>
<td>Figure 4</td>
<td>H &amp; E stained section (40 X) Showing few cells having bizzare nuclei and smudgy chromatin.</td>
</tr>
<tr>
<td>Figure 5 a</td>
<td>Immunohistochemistry for S100 (10X) Showing S100 positivity for sustanteccular network surrounding epithelioid nests.</td>
</tr>
<tr>
<td>Figure 5 b</td>
<td>Immunohistochemistry for S100 (40X) Showing S100 positivity for sustanteccular network surrounding epithelioid nests.</td>
</tr>
</tbody>
</table>

**Figure : -**

![Figure 1](image1.jpg)

![Figure 2](image2.jpg)
Figure 3

Figure 4
Paraganglioma in supraglottic area: A rare case report

Figure 5 a

Figure 5 b
Acknowledgement:

We would like to thanks ENT Department of Mahatma Gandhi Medical College and Hospitals for their logistic support.

References: