Polypoid Adenosquamous Carcinosarcoma of the Epiglottis with Blastomatous Features*

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ABSTRACT

A case is reported of polypoid adenosquamous carcinosarcoma with blastomatous features arising in the epiglottis. A 69-year-old man with hoarseness and sore throat was found to have a six cm pedunculated mass located on the epiglottis. Upon examination by light microscopy, it was found that the tumor was composed of not only well to poorly differentiated in situ and invasive squamous cell carcinoma but also adenocarcinoma with blastomatous features and a malignant primitive stroma, with features of undifferentiated sarcoma and focal chondrosarcomatous differentiation. To the best of our knowledge, this appears to be the second case of laryngeal adenosquamous carcinosarcoma with blastomatous features reported in the English literature and the third case in the world literature.

Introduction

Squamous cell carcinoma is by far the most common malignant neoplasm occurring in the larynx. Adenocarcinoma is much more infrequent; adenosquamous carcinoma and sarcoma of the larynx are rare, and carcinosarcoma is extremely rare, with the epithelial component virtually limited to squamous cell carcinoma. The following report documents a case of adenosquamous carcinosarcoma of the epiglottis, which apparently is the second report of such a laryngeal neoplasm in the English literature and the third report in the world literature. Blastomatous features, comparable to the rare pulmonary blastoma, were also present in the two American cases and probably in the Russian case.

Case Report

A 69-year-old white male was admitted with complaints of a sore throat for ten weeks, a "muffled hot
potato" voice change for six months, difficulty swallowing, and 14 pounds weight loss in six weeks. Indirect laryngoscopy revealed a large exophytic mass of the epiglottis. Epiglottic biopsy demonstrated invasive poorly differentiated squamous cell carcinoma. Total laryngectomy was performed. The patient subsequently developed bilateral cervical tumor recurrence, but additional surgery was not performed. He was treated with radiation and chemotherapy and died six months following his surgery. Autopsy permission was not obtained.

The laryngectomy specimen (figure 1) measured 7 x 6.5 cm in overall dimensions. Attached to the left mucosal surface of the epiglottis was a pedunculated 6 x 5.5 x 3 cm mass. The external surface of this mass was slightly nodular, granular, and yellow-brown, and the cut surface was homogeneous, soft, and tan. True and false cords were grossly unremarkable.

Microscopically, the polyloid epiglottic tumor demonstrated various histological patterns and cell types. Squamous cell carcinoma, well to poorly differentiated, was seen to arise from the mucosa (figures 2 and 3) and to invade the underlying epiglottic cartilage. Merging and intermingled with this invasive squamous cell carcinoma were areas of neoplastic glandular, blastematos and mesenchymal proliferation (figures 4 to 8). The glandular component was composed of cells with slight to moderate nuclear hyperchromasia, moderate nuclear vesicularity, focal prominent nucleoli, and rare to moderate numbers of mitotic figures. The blastematos component (figures 4 to 6) merged and focally mingled with the glandular component. It was composed of plump spindle-shaped cells with varying degrees of nuclear atypia and rare to moderate numbers of mitotic figures. These blastematos areas focally merged with a more sarcomatous-appearing mesenchymal component, composed of cells variably arranged in disorganized, parallel and storiform patterns (figure 7), and rare foci consistent with chondrocytic differentiation (figure 8) were present.

Snook's reticulum-stained sections (figure 6) demonstrated reticulin fibers surrounding almost all cells in the areas of blastematos and neoplastic mesenchymal proliferation and a virtual absence of reticulin in the areas of squamous cell carcinoma and adenocarcinoma. Mucicarmine and periodic acid Schiff (PAS) stain after diastase digestion demonstrated only rare foci of intracytoplasmic mucin in the adenocarcinomatous areas. The PAS stain showed small amounts of diastase-sensitive material consistent with glycogen in the cytoplasm of some squamous and glandular tumor cells. Masson-trichrome stain demonstrated very small amounts of collagen deposition in the neoplastic mesenchymal areas, but muscle cells were not identified. Bodian stain was negative for nerve fibers. Sections stained for immunoperoxidase-labeled pankeratin and epithelial membrane antigen demonstrated positivity in the cytoplasm of the squamous cell carcinoma, the intensity of reaction diminishing with decreasing differentiation of the tumor cells. Some areas of plump spindle cells, difficult to distinguish between poorly differentiated squamous cell carcinoma, blastema, and sarcoma, focally had faintly positive antikeratin reactions. The more definite blastematos and mesenchymal neoplastic areas composed of more elongated spindle cells with individual cell reticulum were consistently negative for keratin and epithelial membrane antigen and positive for vimentin.

Electronmicroscopic studies, on formalin-fixed tissue post-fixed in glutaraldehyde, included cells compatible with each of the three cell types seen by light microscopy; however, ultrastructural evaluation was hindered by autolytic degenerative changes. Sufficient morphologic detail was retained in the neoplastic mesenchymal areas to determine collagen fiber deposition parallel to and contiguous with the cytoplasmic membrane of these cells.

Discussion

The laryngeal neoplasm reported here is highly unusual in its morphology. Grossly, it had a prominent polyloid configuration. Histologically, the tumor was composed of epithelial and mesenchymal components. The epithelial component included well to poorly differentiated in situ and invasive squamous cell carcinoma, and also adenocarcinoma with blastomatos features. The mesenchymal component consisted of a malignant primitive stroma, with features of undifferentiated sarcoma and focal chondrosarcomatous differentiation. The intermingling of the non-mucinous adenocarcinoma and the primitive stroma gave a blastomatos appearance to the neoplasm.

A diagnosis of laryngeal sarcoma or carcinosarcoma requires considerable caution and should only be made after careful exclusion of pure epithelial malignancy. This is because of the now well-recognized laryngeal neoplasms often referred to as pseudosarcoma. This variant of squamous cell carcinoma generally takes two forms: carcinoma with an atypical but non-neoplastic stroma, and carcinoma with focal non-mesenchymal spindle cell features. The non-epithelial nature of the mesenchymal-appearing areas in the present case was supported by the previously described positive reticulum stain, negative immunoperoxidase stains for pan-
FIGURE 1. Gross appearance of the laryngectomy specimen; the pedunculated epiglottic mass has been bisected.

FIGURE 2. Squamous cell carcinoma in situ (on left), which focally involved the surface of the pedunculated epiglottic mass, with submucosal chronic inflammation and fibrosis (on right). (Hematoxylin and eosin stain x125).

FIGURE 3. Invasive squamous cell carcinoma, which was a component of the tumor focally seen to arise from the mucosal in situ carcinoma. (Hematoxylin and eosin stain x313).

FIGURE 4. Neoplastic glandular proliferation (adenocarcinoma) with interspersed neoplastic stroma (blastema), merging with a sarcomatous proliferation in upper one third of the figure. (Hematoxylin and eosin stain x50).
FIGURE 5. Neoplastic glands (adenocarcinoma) with neoplastic stroma composed of plump spindle cells (blastema). (Hematoxylin and eosin stain, ×313).

FIGURE 6. Area of the tumor comparable to figure 5, demonstrating reticulin fibers surrounding most of the blastematos cells but not the cells of the glandular component at the bottom of the figure. (Weigert reticulum stain, ×313).

FIGURE 7. Sarcomatous area of the tumor composed of plump to elongated spindle cells arranged in disorganized, parallel and storiform patterns. (Hematoxylin and eosin stain, ×125).

FIGURE 8. Chondrocytic differentiation focally present in sarcomatous areas of the tumor. (Hematoxylin and eosin stain, ×125).
keratin and epithelial membrane antigen, positive immunoperoxidase stain for vimentin, and electron microscopic findings.

This appears to be the third reported case of carcinosarcoma of the larynx with blastomatous features. As indicated in table I, these three cases are very similar in almost all regards. All were white males in their sixties with a three month duration of symptoms prior to diagnosis. The tumors were all supraglottic in location and were polypoid and pedunculated/exophytic. Minor differences, however, are apparent. Histologically, the non-squamous epithelial component of case #1 was more trabecular and less glandular than the other two cases, and the sarcomatous component had some features suggestive of leiomyosarcoma. Clinically, case #2 had no known metastases or recurrence 13 months after laryngectomy, while cases #1 and #3 had regional metastases and died 13 and six months after laryngectomy.

The laryngeal neoplasm of this present case (and the two previously reported cases, particularly case #2) has pathologic features similar to so-called pulmonary blastoma. This rare pulmonary malignant tumor is composed of a mixture of epithelial, stromal, and blastematous elements resembling fetal lung tissue. The epithelial component may be tubuloglandular and/or squamous, and one case with a malignant melanoma

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex</th>
<th>Race</th>
<th>Age</th>
<th>Smoked</th>
<th>Symptoms</th>
<th>Years</th>
<th>Location</th>
<th>Gross</th>
<th>Histology</th>
<th>Metastasis</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M</td>
<td>62 W</td>
<td>?</td>
<td>?</td>
<td>Dysphagia</td>
<td>3 mos</td>
<td>Left</td>
<td>4.5 x 2.5 x 3.5 cm</td>
<td>Carcino- sarcoma: squamous, basaloid (trabecular), sarcoma (! leiomyo)</td>
<td>Cervical lymph nodes</td>
<td>Died</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>65 W</td>
<td>60</td>
<td>4 mos</td>
<td>Weight loss</td>
<td>3 mos</td>
<td>Right</td>
<td>3.3 x 1.7 x 1.6 cm</td>
<td>Carcino- sarcoma: known, squamous, glandular, blastematous, sarcoma</td>
<td>None</td>
<td>No recurrence</td>
</tr>
<tr>
<td>3</td>
<td>M</td>
<td>69 W</td>
<td>100</td>
<td>Weight loss</td>
<td>Epiglottis</td>
<td>2.5 mos</td>
<td>Polyoid</td>
<td>6 x 5.5 x 3 cm</td>
<td>Carcino- sarcoma: bilateral, squamous, glandular, blastematous, sarcoma</td>
<td>Neck</td>
<td>Died</td>
</tr>
</tbody>
</table>

component has been reported. The stromal component may be undifferentiated, cartilaginous, myogenous and/or osseous. The blastematous component, the characteristic feature of this neoplasm, consists of a primitive mesenchyme, which focally may show a transition to the differentiated stromal and occasionally epithelial components. The embryological derivation of this neoplasm is presently uncertain. It does not represent a teratocarcinoma, since these contain organoid structures and no blastematous component. It may best be considered a form of carcinosarcoma, although some reports of immunohistochemical studies suggest rather a biphasic tumor. Whether or not it is derived from two germ layers, ectoderm and endoderm, or from a pluripotential cell that gives rise to epithelial and mesenchymal elements, however, is debatable.

Regardless of the derivation of these rare pulmonary malignant neoplasms, their similarity to the present (and two previously reported) laryngeal neoplasms is clearly evident. Comparable extrapulmonary presentation has been previously reported in the nasopharynx. Furthermore, this occurrence of similar neoplasms in these two areas is not surprising, in view of the common embryologic origin of the lungs, bronchi and larynx—the ventral wall groove in the branchial arch region of the foregut.

In summary, this unusual neoplasm appears to be the third reported case of laryngeal adenosquamous carcinoma with blastomatous features, a tumor with pathologic features similar to pulmonary blastoma.

Acknowledgments

The authors gratefully acknowledge: review of histological sections by John G. Batsakis, MD, M.D. Anderson Hospital and Tumor Institute, and Vincent J. Hyams, MD and Dennis K. Heffner, MD, Armed Forces Institute of Pathology; translation of reference 9 by George Melnykovych, PhD, Research Service, Kansas City Veterans Affairs Medical Center; technical assistance by the Histology Section, Laboratory Service, Kansas City Veterans Affairs Medical Center; and secretarial assistance by Joyce Capps.

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