

nerve involvement has been noted in ~25% of patients. Although a low-grade variant of this tumor has been described, high-grade variants of this neoplasm have been regarded as one of the most aggressive types of salivary gland carcinoma. One review has revealed that one-third of patients with these neoplasms developed local recurrence and 46% developed distant metastasis (Ellis and Auclair 1996). The high-grade lesions are epitomized by local invasion, hematogenous and lymphatic metastasis, and a dismal prognosis (Delgado, Klimstra, and Albores-Saavedra 1996; Ellis and Auclair 1996; Guzzo et al. 2002).

### Primary Mucinous Adenocarcinoma

Primary mucinous adenocarcinoma of salivary glands is an uncommon low-grade malignant neoplasm distinguished by significant quantities of extracellular epithelial mucin. The tumors generally are organized as cords, nests, and/or appear as solitary epithelial cells. Almost all known cases of these lesions have presented with minimal symptoms and have been limited to the major salivary glands. Interestingly, the predominant site for these tumors has been the submandibular glands (Ellis and Auclair 1996; Osaki et al. 1990). These are extremely rare lesions with no known frequency of occurrence.

### Malignant Mixed Tumors

Carcinoma ex-pleomorphic adenoma, carcinosarcoma, and metastasizing mixed tumor have all been regarded as subtypes of malignant mixed tumors. The most common among these is the carcinoma ex-pleomorphic adenoma. On the other hand, the carcinosarcoma is a true malignant mixed tumor. However, the carcinosarcoma and the metastasizing mixed tumor, which is semantically an inexactness, are extremely rare (Ellis and Auclair 1996).

### Carcinoma Ex-pleomorphic Adenoma

Carcinoma ex-pleomorphic adenoma, sometimes termed "carcinoma ex-mixed tumor," is a malignant epithelial neoplasm that demonstrates evidence of arising primarily from or in a benign pleomorphic adenoma in one of the major salivary glands (Roijs et al. 2002). Thus, diagnosis necessitates that the sample contains benign tumor as

well as carcinomatous elements (LiVolsi and Perzin 1977). AFIP files have indicated that carcinoma ex-pleomorphic adenoma encompasses 8.8% of all mixed tumors and 4.6% of all malignant salivary gland tumors, making it the sixth most common malignant salivary gland tumor (Ellis and Auclair 1996). The most common clinical symptoms have been that of a painless mass, although one-third of patients have been noted to present with facial paralysis (Ellis and Auclair 1996). Similar to other major salivary gland tumors, tumor stage, grade, and degree of invasion determine prognosis (Brandwein et al. 2002).

### Salivary Carcinosarcoma

Salivary carcinosarcoma has also been regarded and termed as a bona fide malignant mixed tumor. Consequently, these neoplasms contain elements that are both carcinoma and sarcomatous in nature. Either or both components are expressed in metastatic lesions. Although carcinosarcomas may develop on their own, others arise in association with or within benign mixed tumors. The majority of tumors occur in the major salivary glands, where they have presented clinically with swelling, pain, nerve palsy, and/or ulceration. These tumors are extremely unusual, with only a few cases being acknowledged by the AFIP (Ellis and Auclair 1996). Carcinosarcoma is an aggressive, high-grade malignancy with a survival of 3.6 years (Stephen et al. 1986).

### Metastasizing Mixed Tumor

Metastasizing mixed tumor is an uncommon histological benign salivary gland neoplasm that enigmatically metastasizes. Reportedly, long intervals occur between the diagnosis of a primary "benign" tumor and the metastases. The histological attributes are essentially those that epitomize pleomorphic adenoma (Ellis and Auclair 1996). The majority of these lesions occur in the major salivary glands as a single, well-defined mass. Interestingly, metastases or recurrences may occur up to 26 years after excision of the primary neoplasm (Schneider et al. 1977).

### Rare Carcinomas

#### *Primary Squamous Cell Carcinoma*

Primary squamous cell carcinoma is a rare neoplasm of salivary glands. This neoplasm occurs in