

preservation of the facial nerve by careful dissection gave favorable oncologic results (Guntinas-Lichius, Klussman, and Schroeder et al. 2004). Finally, a disease-free survival in patients with normal, partially, and completely impaired facial nerve function preoperatively of 69%, 37%, and 13% despite the use of facial nerve sacrifice and postoperative RT indicates what a poor prognosis invasion of the nerve confers (Terhaard, Lubsen, and Tan et al. 2006).

In specific histologic tumor types variable results for different treatments have been reported. Mucoepidermoid carcinoma is the commonest salivary malignancy and most cases are fortunately low or intermediate grade. A series of 89 cases at the Mayo Clinic, 69 T1-2, 85 N0, and 83 low/intermediate grade, were treated by parotidectomy with "appropriate" neck dissection and only 7 had RT. Kaplan-Meier estimated cancer-specific survival rates at 5, 15, and 25 years were 98.9%, 97.4%, and 97.4% (Boahene, Olsen, and Lewis et al. 2004). Using a point grading system for histopathologic features in a series of 234 mucoepidermoid carcinomas of the major salivary glands, cystic component <20%, 4 or more mitotic figures per 10 high power fields, neural involvement, necrosis, and anaplasia were found to have prognostic significance for parotid MEC (Goode, Auclair, and Ellis 1998). Intermediate-grade MEC tends to behave more like low-grade MEC, while high-grade MEC behaves aggressively with local recurrence and regional and distant metastases in the majority of cases. Other low-grade tumors such as acinic cell carcinoma, epimyoeplithelial carcinoma, and low-grade adenocarcinoma all can be treated like low-grade MEC. Polymorphous low-grade adenocarcinoma is rare in the major glands, being seen mostly in the minor salivary glands of the oral cavity.

On the other hand, results for high-grade tumors such as primary squamous carcinoma of the parotid are poor; in one published series two-thirds were treated with radical surgery and RT and one-third with RT alone, but 5-year actuarial survival and disease-free survival was 31% and 33%, respectively (Lee, Kim, and Parks et al. 2001). Malignant change in PAs is most commonly seen as carcinoma ex-pleomorphic adenoma, and prognosis will depend on the histologic type of malignancy and whether the malignancy has spread outside the capsule. In carcinoma ex-pleomorphic adenoma the use of postoperative RT improved 5-year local control from 49% to 75%

and improved survival in patients without cervical metastasis (Chen, Garcia, and Bucci et al. 2007). Two other forms of malignant PA occur, both rare: the "true" malignant mixed tumor or carcinosarcoma where malignant change is seen in both the epithelial and myoeplithelial component of the PA, and the benign metastasizing PA, which as its name suggests retains a benign histologic appearance despite the presence of metastases.

It is hard to interpret survival figures in some series, as ACC is very slow growing and 5-year survival is less meaningful in this neoplasm as survival continues to fall on 20-year follow-up. Thus in series with short follow-up ACC will erroneously be thought to have a good prognosis. Typical long-term survival figures are 84.3% 2 year, 75.9% 5 year, 50.49% 10 year, and 20.11% after 20 years (Issing, Hemmanouil, and Wilkens et al. 2002). The type of histologic appearance, solid vs. cylindrical, and the presence of perineural invasion are important prognostic factors. Even with documented lung metastases patients can live 5+ years, the average survival between the appearance of lung metastases and death being 32.3 months in one series (van der Waal et al. 2002). Wide field adjuvant RT post-radical surgery is usually recommended for ACC.

The histologic grade of the tumor must be taken into account as well as TNM staging when interpreting survival results in reported series. Every parotid cancer will be unique and the decision for what is the correct surgery will be made on an individual basis for each patient.

## Summary

- 80% of parotid tumors are benign and most commonly pleomorphic adenomas.
- Less than one-third of malignant tumors will have obvious clinical signs of malignancy, for example, facial nerve palsy, ulceration, fixation, or lymphadenopathy.
- Routine use of CT or MR imaging does not appear justified and should be used selectively for malignant neoplasms and deep lobe tumors.
- Preoperative open biopsy is contraindicated and FNAB is the modality of choice for preoperative cytologic diagnosis.