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Diagnosis of salivary gland tumors from morphology to molecular markers

Salivary glands tumors have numerous entities and each tumor type is of wide histologic spectrum. Clinical presentation is not particularly helpful, with the usual presentation of a bump. The growth pattern of the tumor is a very critical histologic feature. If it is invasive and destructive, the tumor is very likely to be malignant. If it is well circumscribed/well demarcated, it is either a benign or a low grade tumor. Based on the presence of one cell type (luminal or non-luminal alone) or mixed luminal and non-luminal cell component (with an obvious extracellular matrix or not), we can classify most of the salivary gland tumors. Fine needle aspiration has been very useful in screening lesions with minimal trauma. However, previous FNA procedures can induce squamous metaplasia and tissue infarction, which sometimes misleads the pathologist. The metaplastic change also can mimic a low-grade mucoepidermoid carcinoma. On the other hand, a low-grade carcinoma such as cystic mucoepidermoid carcinoma is easily misdiagnosed a benign lesion, due to unimpressive bland cytological features. Immunohistochemistry studies are valuable when used along with histology; the main application is to demonstrate the cellular differentiation. Modern molecular tools such as FISH are important in separating those tumors with overlapping morphology. Translocations are found in adenoid cystic carcinoma (49%, MYB-NFIB), low and intermediate grade mucoepidermoid carcinoma (55%, CRTC1-MAML2), low-grade hyalinizing clear cell carcinoma (>80%, EWSR1-ATF1), and secretory carcinoma (>90%, ETV6-NTRK3). It is more stressful when we handle salivary gland tumors intra-operatively, because of the freezing artifacts and limited time, as well as the unavailability of ancillary tools. The combination of tumor demarcation, cell types, and cytological features can lead to correct diagnoses for most cases. For those rare and difficult cases, separating benign/low grade from high-grade tumors is usually sufficient to guide the immediate surgical procedure.

Biography

Qihui Zhai is a Pathologist at Mayo Clinic. He received his Medical degree from Shandong Medical University and has been in practice for more than 20 years. He is one of 13 doctors at Mayo Clinic who has specialization in Pathology.

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