

Fig. 3. Keratinization is not seen (hematoxylin and eosin). Bar = 200 μm .

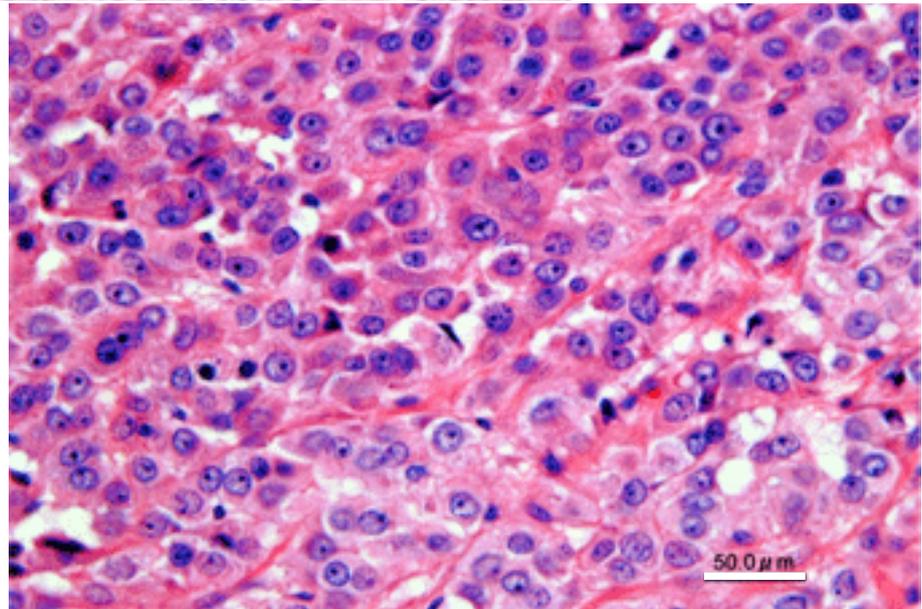


Fig. 4. Tumor cells, arranged in palisades and sheets, show large, atypical nuclei (hematoxylin and eosin). Bar = 50 μm .

ifferentiated carcinoma includes other primary salivary gland neoplasms: adenoid cystic carcinoma, epidermoid carcinoma, malignant melanoma, adenocarcinoma, poorly differentiated squamous cell carcinoma, lymphoma and sarcoma. In our patient, fine-needle aspiration cytologic examination resulted in a provisional diagnosis of adenocarcinoma versus pleomorphic adenocarcinoma. It was reported that high grade mucoepidermoid carcinoma or poorly differentiated adenocarcinoma or squamous cell carcinoma or melanoma could not be ruled out because of cytomorphological overlap (Moore and Bocklage, 1998).

Undifferentiated carcinomas of the submandibular gland occur in adults. Patients have ranged in age from 40 to 96 years, with the peak incidence in the 7th and 8th decades (Ellis and Auclair, 1996). However, 4 of 6 patients in 1 series were under 50 years old (Nagao et al., 1982). Rapid growth of a recently discovered mass is a common clinical presentation. Tumors typically are firm and fixed. Many patients already have cervical lymphadenopathy at the time of diagnosis of the primary salivary gland carcinoma (Ellis and Auclair, 1996). Patients generally are treated with surgical excision, ipsilateral neck dissection

and postoperative radiotherapy, with 50 to 60 Gy delivered over 5 to 6 weeks (Hui et al., 1990).

The prognosis of large-cell undifferentiated carcinoma of salivary glands is poor, with a 10-year survival rate of 0% to 35% reflecting distant metastasis and recurrence. Various subtypes and other histopathologic features of undifferentiated carcinomas have had little prognostic importance (Hui et al., 1990), with tumor size being the most important prognostic factor. Neoplasms 40 mm or larger had a particularly poor outcome (Hui et al., 1990). Wang et al. reported 3 factors predicting a poor outcome for these patients: age over 50 years, cervical lymph node metastasis and tumor size over 60 mm. Locoregional control was obtained much more often in patients with smaller primary neoplasms (Wang et al., 2004).

It has not yet been confirmed whether chemotherapy is effectively inhibits loco regional recurrence or distant metastasis. Hatta et al reported that chemotherapy should be administered when tumor diameter exceeds 4 cm is agreeable, because prognosis becomes very poor (Hatta et al., 2003). Chemotherapy has not been administered to our patient, considering that the tumor size did not exceed 4 cm. Aggressive chemotherapy may worsen the patient's performance status. Continuously further investigation is necessary to clarify the effectiveness of adjuvant chemotherapy.

References

- 1 Ellis GL, Auclair PL. Tumors of the salivary gland. Atlas of tumor pathology. 3rd series. Washington DC: Armed Forces Institute of Pathology; 1996. p. 306–311.
- 2 Eneroth CM. Histological and clinical aspects of

- parotid tumors. *Acta Otolaryngol (Suppl)* 1964;191:1–99.
- 3 Hatta C, Terada T, Okita J, Kakibuchi M, Kubota A, Sakagami M. Clinicopathological study of undifferentiated carcinoma of the parotid gland. *Auris Nasus Larynx* 2003;30:273–277.
- 4 Hui KK, Luna MA, Batsakis JG, Ordonez NG, Weber R. Undifferentiated carcinoma of the major salivary glands. *Oral Surg Oral Med Oral Pathol* 1990;69:76–83.
- 5 Lin Y, Wu H, Tzeng J. Small-cell undifferentiated carcinoma of the submandibular gland: an extremely rare extrapulmonary site. *Am Otolaryngol* 2005;26: 60–63.
- 6 Moore JG, Bocklage T. Fine-needle aspiration biopsy of large-cell undifferentiated carcinoma of the salivary glands: presentation of two cases, literature review, and differential cytodiagnosis of high-grade salivary gland malignancies. *Diagn Cytopathol* 1998; 19:44–50.
- 7 Nagao K, Matsuzaki O, Saiga H, Sugano I, Shigematsu H, Kaneko T, et al. Histopathologic studies of undifferentiated carcinoma of the parotid gland. *Cancer* 1982;50:1572–1579.
- 8 Patey DH, Thackray A, Keeling DH. Malignant disease of the parotid. *Br J Cancer* 1965;19:712–737.
- 9 Seifert G, Donath K. Classification of the pathohistology of disease of the salivary glands: review of 2600 cases in the Salivary Gland Register. *Beitr Pathol* 1976;159:1–32.
- 10 Uemaetomari I, Ito Z. Large-cell undifferentiated carcinoma of the submandibular gland. *Auris Nasus Larynx* 2005;32:431–434.
- 11 Wahlberg P, Anderson H, Björklund A, Moller T, Perfekt R. Carcinoma of the parotid and submandibular glands—a study of survival in 2465 patients. *Oral Oncol* 2002;38:706–713.
- 12 Wang CP, Chang YL, Ko JY, Lou PJ, Yeh CF, Sheen TS. Lymphoepithelial carcinoma versus large cell undifferentiated carcinoma of major salivary glands. *Cancer* 2004;101:2020–2027.

Received October 22, 2008; accepted January 6, 2009

Corresponding author: Kazunori Fujiwara, MD