

- cells with altered expression of chemokine and adhesion receptors. *J. Exp. Med.* 2004; **199**: 59–68.
3. Piris M, Foucar K, Mollejo M, Campo E, Falini B. Splenic B-cell lymphoma/leukaemia. In Swerdlow SH, Campo E, Harris NL, *et al.* eds. *World Health Organization classification of tumours of haematopoietic and lymphoid tissues*, 4th edn. Lyon: IARC Press, 2008; 191–193.
  4. Traverse-Glehen A, Baseggio L, Salles G, *et al.* Splenic diffuse red pulp small B-cell lymphoma: toward the emergence of a new lymphoma entity. *Discov. Med.* 2012; **13**: 253–265.
  5. Kanellis G, Mollejo M, Montes-Moreno S, *et al.* Splenic diffuse red pulp small B-cell lymphoma: revision of a series of cases reveals characteristic clinico-pathological features. *Haematologica* 2010; **95**: 1122–1129.
  6. Tiacci E, Trifonov V, Schiavoni G, *et al.* BRAF mutations in hairy-cell leukemia. *N. Engl. J. Med.* 2011; **16**: 2305–2315.

## Adenosquamous carcinoma of the parotid gland

DOI: 10.1111/his.12189

© The Authors. Histopathology published by John Wiley & Sons Ltd.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

**Sir:** Adenosquamous carcinoma (ASC) is a rare malignant tumour in the head and neck region, and usually occurs as a mucosal carcinoma. The World Health Organization classification<sup>1</sup> categorizes this tumour as a variant of squamous cell carcinoma (SCC), whereas the Armed Forces Institute of Pathology (AFIP) classification<sup>2</sup> categorizes it as a salivary gland tumour. In the AFIP guidelines, the occurrence of ASC is limited to the minor salivary glands. Alos *et al.*<sup>3</sup> suggested the following criteria for the diagnosis of ASC: (i) the most common component is usually keratinizing SCC; (ii) the second component is adenocarcinoma in the deeper portion; and (iii) severe dysplasia or carcinoma *in-situ* (CIS) is seen in the surface epithelium. We report here a case of ASC arising from the parotid gland.

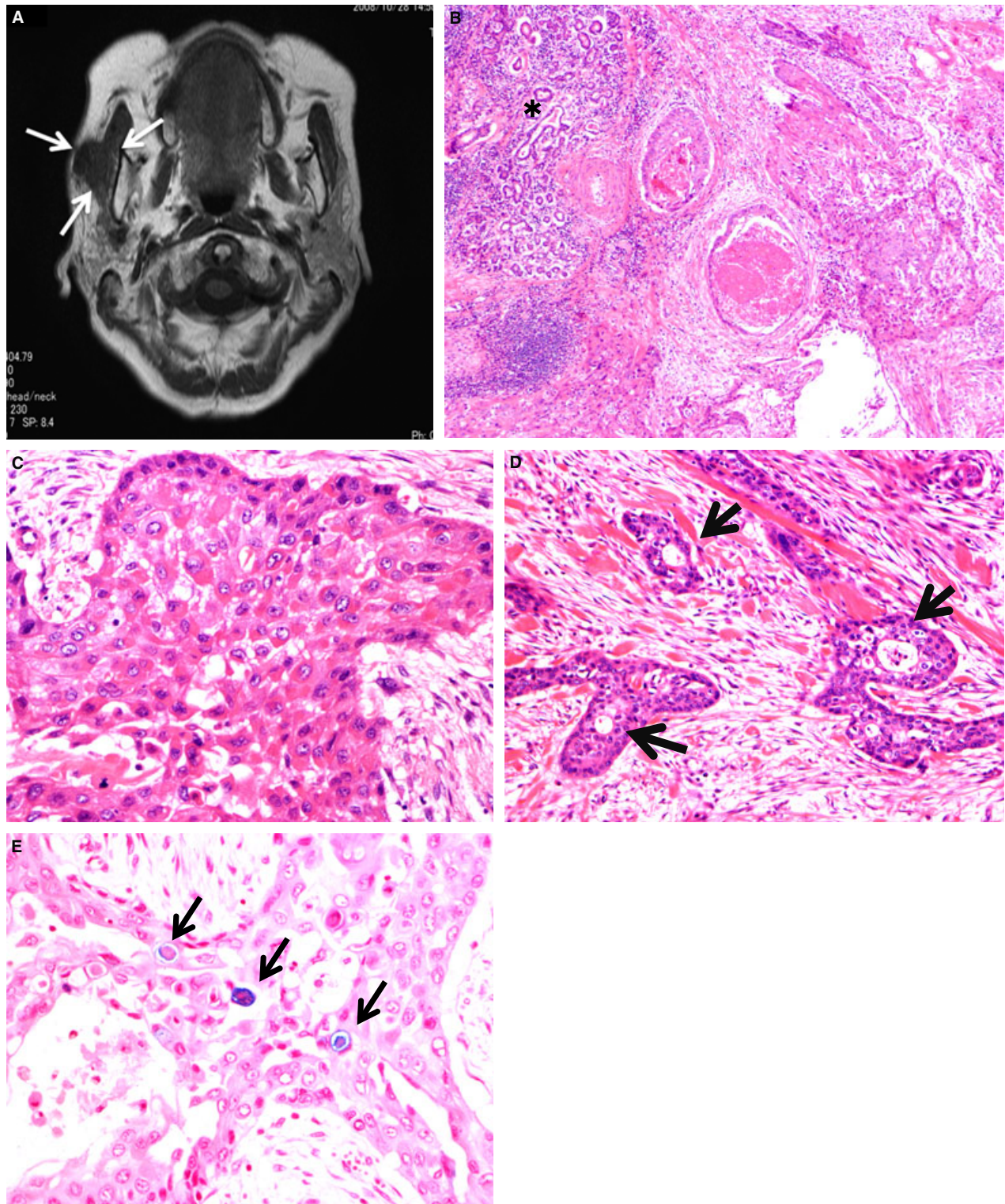
A 78-year-old Japanese woman developed rapid swelling in the right buccal region, and was admitted to our hospital 2 months later. Intraoral examination showed no mucosal lesions, but a 30 × 40-mm irregularly-shaped mass was seen in the anterior portion of the right parotid gland. Magnetic resonance imaging (MRI) showed that this mass had low intensity on T1-weighted imaging and partially high intensity on T2-weighted imaging (Figure 1A). Positron emission tomography showed no evidence of other primary

lesions. Total parotidectomy was performed following a clinical diagnosis of parotid gland carcinoma.

Macroscopically, an ill-defined greyish-white mass was observed in the anterior portion of the right parotid gland. Histologically, most of the tumour consisted of nest-like growth of atypical squamous epithelium with keratinization and, focally, cystic change, consistent with the usual type of moderately differentiated SCC around atrophic salivary glands. However, ~20% of the tumour was composed of glandular structures and intracytoplasmic lumens, which were positive for mucin with Alcian blue and periodic acid–Schiff staining (Figure 1B–E); this was considered to be an adenocarcinomatous component. Both components were intermingled. The tumour stroma was desmoplastic, but no goblet intermediate cells were seen. Focal intraductal proliferations of atypical cells, which were considered to be *in-situ* lesions, were also observed in the relatively large excretory ducts (Figure 2). The residual tissues of the parotid gland showed marked atrophy. The tumour in this case consisted of three components: (i) moderately differentiated SCC; (ii) adenocarcinoma; and (iii) intraductal lesions. Immunocytochemistry for CK7 and p63 distinguished between the glandular and squamous components (see Supporting Information). As this tumour was present in the parotid gland on both MRI and histological examination, and *in-situ* lesions were seen in the large excretory ducts, we believe that this tumour was ASC arising from the parotid gland.

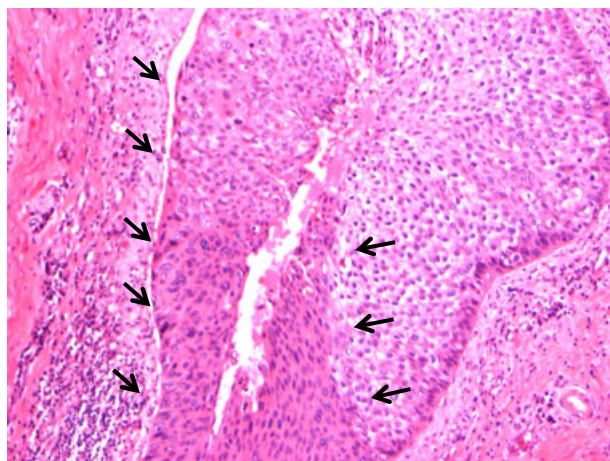
Although rare, ASC of the head and neck region is most often seen in the tongue, oral floor, and larynx, with a peak in the fifth decade of life (male/female ratio, 3:1). Alos *et al.*<sup>3</sup> suggested that the origin of ASC was the surface epithelium, although Gerughty *et al.*,<sup>4</sup> in 1968, proposed that it was the excretory duct of seromucinous glands, indicating that ductal carcinoma *in-situ* (DCIS) was seen in four of 10 cases of ASC. Certainly, most ASCs of the head and neck region might arise from the surface epithelium, owing to the existence of neoplastic squamous epithelium (severe dysplasia or CIS), but we believe that our case might have arisen from the large excretory ducts of the parotid gland.

A differential diagnosis should be considered, especially salivary gland mucoepidermoid carcinoma (MEC). High-grade MEC is usually composed predominantly of intermediate or epidermoid cells but without keratin formation. MEC often has a lobular pattern, and infiltrates by forming wide sheets of neoplastic cells with round contours, whereas ASC infiltrates as thin trabeculae or solid small nests in desmoplastic stroma, typical of SCC. Although ASC was previously



**Figure 1.** Magnetic resonance imaging (T1-weighted imaging) showed an irregularly-shaped mass with variable low intensity (white arrows) in the right parotid gland (A). The tumour was near atrophic salivary gland tissue (asterisk), and showed invasive growth and keratinization with cystic change (B, H&E). The main component showed moderately differentiated SCC with keratinization and intercellular bridges (C, H&E), whereas another component showed adenocarcinoma with glandular structures (arrows) and desmoplastic stroma (D, H&E). Intracytoplasmic lumina (arrows) were positive with Alcian blue staining (E).





**Figure 2.** A focus of *in-situ* lesion, which consisted of intraductal proliferation of atypical cells (arrows), was observed in a relatively large excretory duct (H&E).

considered to be the same entity as MEC,<sup>5,6</sup> the tumours need to be differentiated from each other as they can have different outcomes: ASC is a very aggressive tumour, with a worse prognosis than high-grade MEC.<sup>7</sup> Recently, we found that ASC of the head and neck region had a high rate of lymph node metastasis and a worse prognosis, especially in cases of MUC4 expression (K. Kusafuka *et al.*, submitted). The most important histological features of ASC that differentiate it from MEC are: (i) keratin formation and intercellular bridges; (ii) desmoplasia; (iii) irregularly-shaped nests; (iv) prominent invasive growth near the tissues; and (v) the relative absence of goblet and intermediate cells. MECs, especially of low grade, frequently show *CRTC1-MAML2* gene rearrangement, and even high-grade MECs infrequently show such a rearrangement.<sup>8</sup> ASC often mimics high-grade MEC.

To the best of our knowledge, this case may be the first well-documented case of ASC of a major salivary gland. It may be that some high-grade translocation-negative so-called MECs are in fact examples of ASC.

#### ACKNOWLEDGEMENTS

The authors thank Isamu Hayashi, Yoichi Watanabe, Sachiyo Oono, Kaori Nagata, Hiroshi Tashiro, Koji Muramatsu, Masatake Honda, Masato Abe, Chiho Tashiro, Takuya Kawasaki, Masatsugu Abe, Shogo Fujii, Kyoko Tanaka, and Kazumi Yamamoto, and the staff of the Pathology Division, Shizuoka Cancer Centre, Shizuoka, Japan, for excellent technical assistance. Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

**Kimihide Kusafuka  
Tomoko Miki  
Takashi Nakajima**

*Pathology Division, Shizuoka Cancer Centre, Shizuoka, Japan*

1. Cardesa A, Zidar N, Alos L. Adenosquamous carcinoma. In Barnes L, Eveson JW, Reichard P, Sidransky D eds. *World Health Organization classification of tumours: pathology and genetics of head and neck tumours*. Lyon: IARC Press, 2005; 130–131.
2. Ellis GL, Aulclair P. *Tumors of the salivary glands. Atlas of tumor pathology*, 4th Series Fascicle 9. Washington, DC: Armed Forces Institute of Pathology, 2008; 368–372.
3. Alos L, Castillo M, Nadal A, *et al.* Adenosquamous carcinoma of the head and neck: criteria for diagnosis in a study of 12 cases. *Histopathology* 2004; **44**: 570–579.
4. Gerughty RM, Hennigar GR, Brown FM. Adenosquamous carcinoma of the nasal, oral and laryngeal cavities. A clinipathologic survey of ten cases. *Cancer* 1968; **22**: 98–106.
5. Hyams VJ, Batsakis JG, Michaels L. *Tumors of the upper respiratory tract and ear. Atlas of tumor pathology*, 2nd Series, Fascicle 25. Washington DC: Armed Forces Institute of Pathology, 1986; 104–107.
6. Damiani JM, Damiani KK, Hauch K, Hyams VJ. Mucoepidermoid-adenosquamous carcinoma of the larynx and hypopharynx: a report of 21 cases and a review of the literature. *Otolaryngol. Head Neck Surg.* 1981; **89**: 235–243.
7. Evans HL. Mucoepidermoid carcinoma of the salivary glands: a study of 69 cases with special attention to histologic grading. *Am. J. Clin. Pathol.* 1984; **81**: 696–701.
8. Chenevert J, Barnes LE, Chiosea SI. Mucoepidermoid carcinoma: a five-decade journey. *Virchows Arch.* 2011; **485**: 133–140.

#### Supporting information

Additional Supporting Information may be found in the online version of this article:

**Data S1.** Immunohistochemistry.

**Figure S1.** Immunohistochemistry findings.

#### Reduced number of CD1a<sup>+</sup> and CD83<sup>+</sup> interstitial dendritic cells in herpetic lesions (HSV-1+) of the tongue in patients with advanced-stage AIDS

DOI: 10.1111/his.12196

© 2013 John Wiley & Sons Ltd.

*Sir:* Dendritic cells (DCs) are a heterogeneous population of cells with high phagocytic activity as immature cells and high cytokine-producing capacity as mature cells. DCs are highly migratory cells that move from tissues to the T cell and B cell zones of lymphoid organs via afferent lymphatics and endothelial