CASE REPORT

Hyaline globules in fine-needle aspiration smears of salivary gland neoplasms

Mayank Gupta, Mandeep Singh Bindra

Department of General Pathology, Christian Medical College, Vellore, Tamil Nadu, India

Correspondence to
Dr Mayank Gupta, gupta.mayank103@gmail.com

Accepted 17 February 2015

SUMMARY

Most salivary gland neoplasms can be accurately diagnosed on fine-needle aspiration cytology. Few cases present with overlapping cytomorphological features, so accurate distinction in these cases may be difficult. We describe a case of pleomorphic adenoma that had a close resemblance to adenoid cystic carcinoma on smears due to presence of numerous hyaline globules and bare nuclei. Careful analysis of cellular details along with corroborative clinical evidence clinched the correct diagnosis. This article discusses cytological features of salivary gland tumours in which hyaline globules can be seen on smears.

BACKGROUND

Common salivary gland neoplasms such as pleomorphic adenoma (PA) and adenoid cystic carcinoma (ACC) have characteristic cytological features and can be accurately diagnosed by fine-needle aspiration cytology (FNAC). However, sometimes the diagnosis of these neoplasms on FNAC may not be easy. We present a case of PA displaying numerous hyaline globules and bare nuclei on fine-needle aspiration (FNA) smears that are usually seen in ACC. Careful evaluation of cellular details and clinical features helped in making the correct diagnosis.

CASE PRESENTATION

A 41-year-old woman presented with painless swelling in front of her left ear for 2 years. There was no history of fever or sudden increase in the size of swelling. Cellular FNA smears showed numerous hyaline globules surrounded by cells displaying round to oval nuclei, bland nuclear chromatin, inconspicuous nucleoli and scant cytoplasm. Also seen were cells displaying bland nuclear chromatin and moderate basophilic to amphophilic cytoplasm, arranged in acini and clusters. Numerous dispersed round-to-spindle-shaped bare nuclei were evident. Mitotic figures were not seen (figures 1 and 2).

Although fibrillar chondromyxoid ground substance was not evident in the background, the case was diagnosed as PA due to bland nuclear details. The patient subsequently underwent superficial parotidectomy. Histopathological examination revealed an encapsulated tumour composed of epithelial cells arranged in tubules lined by cuboidal cells surrounded by myoepithelial cells with inconspicuous mitotic activity. Fibromyxoid stroma and pseudo-glandular spaces containing homogenous basement membrane-type material were evident (figures 3–5). Thus the diagnosis of PA was confirmed.

OUTCOME AND FOLLOW-UP

Follow-up in our case was uneventful.

DISCUSSION

Most salivary gland tumours can be diagnosed with a high level of accuracy on FNAC, if established diagnostic criteria are present and strictly observed. High-diagnostic accuracy of FNAC in salivary gland neoplasm has been reported in the literature previously.^{1–4}

PA and ACC have typical cytological features. Smears of PA show poorly cohesive clusters and sheets of ovoid, plasmacytoid and/or spindle cells displaying bland finely granular nuclear chromatin, smooth nuclear membrane and abundant well-defined cytoplasm. Fibrillar chondromyxoid ground substance is usually evident in the background (ref. 5, pp.53–54). Smears of ACC are cellular and show hyaline globules of varying size with attached tumour cells displaying nuclear moulding, high nuclear cytoplasmic ratio, coarse chromatin and scant cytoplasm. Naked nuclei are also evident (ref. 5, pp.66–67). Although hyaline globules are commonly seen in smears of ACC, they can be encountered in smears of PA and other benign salivary gland tumours. Accurate distinction between the two is vital, as surgical management strategies of PA and ACC are different.

Hyaline globules seen in smears of ACC are derived from abundant production of basal lamina by neoplastically modified myoepithelial cells. Rarely encountered hyaline globules seen in smears of PA are speculated to have two origins. First,

Figure 1 Smear showing hyaline globules and numerous bare nuclei. Clusters of cells displaying acinar arrangement with bland nuclear chromatin and moderate amount of cytoplasm are present (red arrow), May-Grünwald Giemsa stain, ×10 magnification.

CrossMark

To cite: Gupta M, Bindra MS. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2014-208114

Figure 2 Smear showing hyaline globule with adherent tumour cells displaying inconspicuous cytoplasm, May-Grünwald Giemsa stain, $\times 40$ magnification.

secretions inspissated in duct-like structures may exhibit metachromasia resembling globular particles. Second, mucoid or hyaline stromal particles may appear as small globules.⁶ Usually, in benign salivary gland tumours, these globules are fewer, less dense and less intensely staining with May-Grünwald Giemsa stain.⁷

Klijanienko diagnosed ACC on the basis of the following features in order of importance: (1) presence of naked nuclei on the internal and external border of characteristic pink cylindrical structures; (2) presence of naked nuclei in finger-like reddish structures; (3) presence of hyaline magenta/red globules; and (4) coarse chromatin of nuclei. They were of the view that the hyaline magenta/red globules supported the diagnosis but were not pathognomonic of ACC, and numerous naked nuclei were of less importance in the diagnosis of ACC. Cylindrical and finger-like structures, coarse nuclear chromatin and very few basaloid cells with well-preserved cytoplasm were diagnostic features of ACC.⁸ We agree with their view, as numerous bare nuclei and hyaline globules were seen in our case of PA. Also, in our case nuclear chromatin was bland and numerous clusters of epithelial cells with moderate amounts of cytoplasm were evident, although cells attached to hyaline globules had scant cytoplasm, favouring diagnosis of PA.

Figure 3 Biopsy displaying tubular structures, pseudoglandular spaces displaying basement membrane-type material and fibromyxoid background, H&E stain, $\times 10$ magnification.

Figure 4 Tubules and pseudoglandular spaces with basement membrane-type material and fibromyxoid background, H&E stain, $\times 20$ magnification.

Hyaline globules may be encountered in smears of other benign salivary gland tumours such as basal cell adenoma. However, in basal cell adenoma, numerous basaloid epithelial cells with bland nuclear chromatin and scant cytoplasm are seen (ref. 5, pp.56–57). In the absence of chondromyxoid stroma, basal cell adenoma was a possible differential diagnosis in our case, but numerous epithelial cells with moderate amounts of cytoplasm ruled out its possibility. Differentiating basal cell adenoma from low-to-intermediate grade ACC may be difficult or sometimes impossible on smears.

Among the other malignant salivary gland neoplasms, hyaline globules can be seen in polymorphous low-grade adenocarcinoma (PLGA) and epithelial-myoepithelial carcinoma. Cytological features of PLGA resemble low-grade ACC but the nuclear chromatin of cells in PLGA appears deceptively bland compared with that of ACC (ref. 5, pp.64–66). Since PLGA is common in the palate, a neoplasm involving a major salivary gland favours diagnosis of ACC.⁶ Distinguishing PA from PLGA may not be possible on smears in the absence of fibrillar chondromyxoid stroma, if hyaline globules are present. Smears of epithelial-myoepithelial carcinoma show a biphasic population comprising of myoepithelial (clear) cells and aggregates of

Figure 5 Pseudoglandular spaces displaying basement membrane-type material and cells displaying bland nuclear chromatin, H&E stain, $\times 40$ magnification.

basaloid cells. Hyaline globules can be seen. However the diagnosis of epithelial-myoeplithelial carcinoma is difficult as a biphasic pattern and clear cells are not always encountered. Histopathological examination aided with immunohistochemistry can exactly characterise such cases.

Thus apart from hyaline globules and bare nuclei, cellular details as described above and clinical features should be considered before diagnosing salivary gland neoplasms on FNA smears, as surgical management of a benign salivary gland neoplasm is different from that of a malignant one. It is important to exercise caution in making a diagnosis of ACC or any other malignant salivary gland neoplasm in view of equivocal cytological features and in the absence of appropriate clinical scenario.

Learning points

- ▶ As hyaline globules can be seen in smears of benign as well as malignant salivary gland tumours, it is important to pay close attention to cellular details to avoid a wrong diagnosis.
- ▶ Mechanism of formation of hyaline globules in adenoid cystic carcinoma and pleomorphic adenoma should be noted.
- ▶ It is important to distinguish benign salivary gland neoplasms from malignant neoplasms as their management is different.

Contributors MG was involved in defining the intellectual content, literature search, and manuscript preparation and review. MSB was involved in the literature search, and manuscript editing and review.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Bocatto P, Altavilla G, Blandamura S. Fine needle aspiration biopsy of salivary gland lesions. A reappraisal of pitfalls and problems. *Acta Cytol* 1998;42:888–98.
- 2 Frable MA, Frable WJ. Fine needle aspiration biopsy of salivary glands. *Laryngoscope* 1991;101:245–9.
- 3 Qizilbash AH, Sianos J, Young JE, *et al*. Fine needle aspiration biopsy cytology of major salivary glands. *Acta Cytol* 1985;29:503–12.
- 4 MacLeod CB, Frable WJ. Fine-needle aspiration biopsy of the salivary gland: problem cases. *Diagn Cytopathol* 1993;9:216–25.
- 5 Orell SR, Klijanienko J. Head and neck; salivary glands. In: Orell SR, Sterrett GF. eds. *Fine needle aspiration cytology*. 5th edn. Edinburgh: Churchill Livingstone, 2012:53–67.
- 6 Nagel H, Hotze HJ, Laskawi R, *et al*. Cytologic diagnosis of adenoid cystic carcinoma of salivary glands. *Diagn Cytopathol* 1999;20:358–66.
- 7 Young TA, Warfield AT. The salivary glands. In: Gray W, McKee GT. eds. *Diagnostic cytopathology*. 2nd edn. Edinburgh: Churchill Livingstone, 2003:315.
- 8 Klijanienko J, Viehl P. Fine-needle sampling of salivary gland lesions III. Cytologic and histologic correlation of 75 cases of adenoid cystic carcinoma: review and experience at the Institute Curie with emphasis on cytologic pitfalls. *Diagn Cytopathol* 1997;17:36–41.

Copyright 2015 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow