Schwannoma-Like Pleomorphic Adenoma: A Case Report with Review of the Literature

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Received: 26 March 2013 / Accepted: 27 June 2013 / Published online: 10 July 2013
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Abstract Pleomorphic adenoma is a common benign salivary gland tumor, which represents about 66 % of benign neoplasms of the salivary glands. Although it can occur in any salivary gland, it is most frequently found in the parotid. Pleomorphic adenomas are renowned for their cytomorphological and architectural heterogeneity that are characterized by intermixed epithelial and mesenchymal-like components. We report a rare case of pleomorphic adenoma of the parotid gland with prevalent schwannoma-like features mimicking a benign schwannoma. Microscopically the tumor showed a prevalence (about 95 %) of schwannoma-like areas with focal (about 5 %) epithelial component with tubular organization. The tumor showed positive immunoexpression for cytokeratin, S-100 protein, and focal expression of p63, CD10 and smooth muscle actin. To the best of our knowledge only six cases of schwannoma-like pleomorphic adenoma have been reported in the literature. The differential diagnosis between this entity and neurogenic and myogenic tumors is discussed.

Keywords Schwannoma-like pleomorphic adenoma · Pleomorphic adenoma · Mixed tumors

Introduction

Pleomorphic adenoma (PA) is the most common benign salivary gland tumor. The parotid gland is the main site of origin of this lesion, but minor salivary glands can be also affected [1]. Benign tumors of the salivary gland are relatively common, constituting from 54 to 79 % of all salivary glands neoplasms. PA represents about 66 % of these benign lesions. Although the large majority (95 %) of pleomorphic adenomas are benign, a small fraction may show an aggressive behaviour (carcinoma ex pleomorphic adenoma). This may occur after multiple local recurrences and/or radiotherapy [1, 2]. Conventional PAs are characterized by a biphasic appearance, resulting from the intimate admixture of epithelium and mesenchymal-like components with low mitotic activity, lacking features of cellular atypia and nuclear hyperchromasia. Frequently a matrix rich in glycosaminoglycans is present [1]. Conversely, malignant PAs are characterized by high mitotic rate, cellular atypia with enlarged and hyperchromatic nuclei and prominent nucleoli, areas of necrosis and infiltrative features. We report a rare case of benign pleomorphic adenoma of the parotid gland with extensive palisaded spindle cell component mimicking a schwannoma.

Case Report

A 44-year-old woman presented for a persistent 3 month swelling localized in the left retromandibular area. Head and neck MRI revealed a well-defined tumor 1.5 cm in size, localized in the deep lobe of the left parotid gland, with parapharyngeal extension. The radiologic features were suggestive of a pleomorphic adenoma (Fig. 1). The lesion was surgically resected and submitted for histology.

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Fig. 1 Magnetic resonance imaging of the tumor in the *left* parotid gland

Macroscopically the tumor appeared as 1.5 cm brownish circumscribed nodule. Microscopically the lesion was encapsulated and hypercellular and at higher magnification, the tumor showed a prevalence (about 95 %) of schwannoma-like areas with a small foci (about 5 %) of epithelial component with tubular architecture. The schwannoma-like areas showed tumor cells with spindle type morphology, small elongated and hyperchromatic nuclei arranged in palisades, with broad areas of Antoni A type. The scant epithelial area was organized in small tubular structures. Immunohistochemical findings showed strong expression of pan-cytokeratin and S-100 protein, a focal expression of p63, CD10 and smooth-muscle-actin. The proliferative index, assessed by Ki67, was about 5 %. Both histological and immunophenotypical features were compatible with the diagnosis of Schwannoma-like pleomorphic adenoma (Figs. 2, 3).

Discussion

Pleomorphic adenomas (mixed benign tumors of the salivary gland) are renowned for their cytomorphological and architectural variability. These tumors are composed by a

mixture of epithelial and stromal components. Although PAs tends to be well circumscribed, small extensions can be seen protruding into the adjacent normal tissue in a pseudo-infiltrative pattern. Epithelial cells of pleomorphic adenoma originate from duct epithelial and myoepithelial cells [1, 3]. Epithelial tumor cells are cuboidal in shape and line duct-like structures that vary in size and shape. Tumor cells of myoepithelial origin, also named modified myoepithelial cells (MMCs) have polygonal, spindle, or plasma cell-like shape, form sheet-, clump-, or strand-like structures and are admixed with a myxoid or myxo-chondroid component [1, 3]. It is well known that MMCs in pleomorphic adenoma occasionally form interlacing fascicles, mostly composed by spindle-shaped cells mimicking neurogenic or myogenic differentiation [1]. Very rarely small areas of MMCs may show schwannoma-like palisading of nuclei, but this feature usually constitutes only a focal aspect of the entire tumor mass [3].

In this report we present a rare case of pleomorphic adenoma with extensive schwannoma-like features representing almost the entire lesion. Schwannoma-like pleomorphic adenomas are composed of modified myoepithelial cells expressing p63, CD10 and pan-cytokeratin by immunohistochemistry [4, 5].

Pleomorphic adenoma mimicking schwannoma is a very rare lesion; at the best of our knowledge only six cases of this nosological entity are reported in the literature [3–6] (Table 1). Five of the cases were described in females and one in a male with age ranging from 39 to 75 years (mean age 57.5 years). The lesions were mostly localized in the parotid gland (five cases), with the exception of a unique case that was localized in the hard palate [3–6]. The diameter of the lesions varied from 1.5 to 3.5 cm (mean value 2.6 cm). In all the reported cases, areas consisting of spindle cells arranged in palisades resembling a benign schwannoma were described.

Fine-needle aspiration biopsy (FNAB) is a widely accepted tool for the diagnosis of salivary gland tumors, in particular for pleomorphic adenoma [4]. However, in the presence of lesions with prevalent schwannoma-like architecture this method may be inadequate to distinguish among PA and neurogenic or myogenic tumors [4, 7].

Schwannomas associated with cranial and peripheral nerves have been reported within salivary glands and there are published cases that have been initially misdiagnosed as schwannoma-like pleomorphic adenoma [7]. In addition, a glandular variant of schwannoma has been also reported in the literature [8]. This lesion was characterized by entrapped or metaplastic glands in an otherwise pure

Fig. 2 Histological and immunohistochemical features of schwannoma-like pleomorphic adenoma. **a** The tumor is composed by spindle-shaped cells with elongated nuclei and ill-defined cell contours, with nuclear palisading resembling Antoni-A areas of schwannoma (hematoxylin and eosin, 200X magnification). **b** As highlighted by staining for CK AE1/AE3 (indirect immunoperoxidase

staining, 100× magnification) both the epithelial and spindle-shaped cells are immunoreactive for cytokeratin. **c** Note the stronger staining of the glandular component as compared to the spindle cells component (25× magnification); **d** Antoni A-like areas expressing cytoplasmic S-100 protein, a common feature of schwannoma and PA (indirect immunoperoxidase staining, 100× magnification)

schwannoma. This very rare variant of schwannoma can generate further confusion in the differential diagnosis of schwannoma-like pleomorphic adenoma. This diagnostic problem can be solved using an ancillary technique like immunohistochemistry: a positive staining for cytokeratin, both in the mesenchymal-like and epithelial areas, makes

possible the diagnosis of schwannoma-like pleomorphic adenoma [1]. In conclusion schwannoma-like pleomorphic adenoma is a rare variant of PA that, although biologically benign, deserves to be considered in the differential diagnosis with neurogenic and myogenic tumors of the parotid gland.

Fig. 3 Immunophenotype of schwannoma-like PA. Schwannoma-like spindle cells focally express, **a** CD10, **b** p63 and show low proliferating index (about 5 %) as assessed by **c** Ki-67 immunostaining. **d** Spindle

cells also show a weakly but diffusely positivity for smooth-muscle actin (**a**, **b**, **d** 200× magnification; **c** 100× magnification)

Table 1 Schwannoma-like PA cases reported in the literature

Author	Age	Sex	Localization	Diameter (cm)
Merino case 1	74	F	Parotid	2.5
Merino case 2	39	F	Parotid	1.5
Takeda case 1	62	M	Parotid	Not reported
Takeda case 2	48	F	Hard palate	Not reported
Kajor	75	F	Parotid	3
Tille	47	F	Parotid	3.5
Present case	44	F	Parotid	1.5

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