

CASE REPORT

Pleomorphic adenoma with extensive necrosis: report of two cases

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Pleomorphic adenoma (PA) is the most common neoplasm for both the major and minor salivary glands. While PA is occasionally associated with cystic change or hemorrhage necrosis, spontaneous infarction appears to be very uncommon. We report two unusual cases of extensive necrosis of PA; one occurred in the palate with the necrotic tumor mass slipping into the oral cavity. This phenomenon, possibly associated with incision biopsy, has never been described previously. A second case, arising in the parotid with spontaneous tumor necrosis, poses some dilemma in differential diagnosis.

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Introduction

Pleomorphic adenoma (PA) is the most common neoplasm in both the major and minor salivary glands; for major gland, PA is the most frequently occurring tumor of the parotid gland, whereas palatal PA is the most prevalent of the minor gland tumors (Waldron, El-Mofty and Gnepp, 1988). Clinically, PA generally presents as a slowly enlarging, firm, well-circumscribed, painless nodule but occasional cases present after a short period of rapid growth or have been associated with pain (Foote and Frazell, 1953). While PA is rarely associated with cystic change or hemorrhagic necrosis (Foote and Frazell, 1953), spontaneous infarction appears to be very uncommon, in as much as a few large, detailed reviews of salivary gland tumors have not commented on this phenomenon in a combined total of 576 PA (Isacsson and Shear, 1983; Eveson and Cawson, 1985; Regezi *et al.*, 1985; Waldron *et al.*, 1988). To our knowledge, only two reports (Layfield *et al.*, 1992; Allen *et al.*, 1994) of spontaneous necrosis in PA have been documented in

the English-language literature. Furthermore, there were a few cases of necrotic PA following fine-needle aspiration (FNA) (Gottschalk-Sabag and Glick, 1995; Pinto, Couto and Mandreker, 1996; Li *et al.*, 2000; Bayramoglu *et al.*, 2001; Pabuccuoglu *et al.*, 2001).

A review of the surgical pathology database in our institution for the period 1979 to 2002 revealed only two cases of benign PA with central necrosis. Below we report these two cases with emphasis on the unique clinical phenomenon of the palatal necrotic tumor slipping into the patient's mouth (our first case) and on the dilemma of histologic diagnosis of the parotid necrotic tumor (our second case). Furthermore, a brief review of the pertinent literature on the subject is also presented.

Case I

A 28-year-old Taiwanese male presented to the dental clinic of our institution with a rubber-like, painless, non-tender circumscribed lesion, measuring about 5 × 5-cm in diameter, and located in his right hard and soft palate extending to the midline (Figure 1). An initial mass was believed to have been stationary and present there for a period of about 1 year. The lesion, however, had grown rapidly recently to its size at patient presentation, causing some feelings of discomfort. The patient's medical history was unremarkable, and no other abnormalities were found upon further examination. Radiographic findings were unremarkable, and routine laboratory investigations appeared normal. The clinical impression was that of a palatal PA. Subsequently, an incision biopsy was performed under local anesthesia, and the biopsied tissue then being sent for histopathological examination. Microscopic observation revealed a well-delineated lesion comprising epithelial and myoepithelial cells in a hyalinized connective-tissue stroma with flattened and cuboidal ductal epithelial cells present (Figure 2). This confirmed the clinical diagnosis of a PA.

One week subsequent to biopsy, the patient returned for suture removal and the palatal mucosa was found to have healed satisfactorily clinically. The diagnosis of PA was conveyed to the patient, and the complete treatment

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Figure 1 Case 1. A large well-circumscribed swelling in the right palate

planning for the surgical removal of the tumor and subsequent rehabilitation procedures as well as the potential for complications were explained to him. As he required further consideration of his situation and options, the planned surgery was temporarily delayed. Two weeks later, the patient returned to our dental clinic with the complaint that a firm mass had been noted to have 'slipped' into his oral cavity from the original incision biopsy wound on an occasion when he was laughing vigorously and loudly.

During that time, despite our thorough explanation about the possibility of tumor recurrence to the patient, he still refused to have any more treatment especially when he understood the tumor had been necrotic. Then, curiously, without the need for anesthesia, a firm mass, measuring about 2.5-cm in diameter, was subsequently easily removed through the original biopsy site. The mass was grayish in appearance, and subsequent histological examination revealed virtually complete tumor necrosis with no findings of PA being noted (Figure 3). The patient has since been followed-up regularly for 18 months without any evidence of any recurrence of the initial lesion or the development of any further associated signs

or symptoms. The patient will continue to be followed-up at regular intervals for some time to come.

Case 2

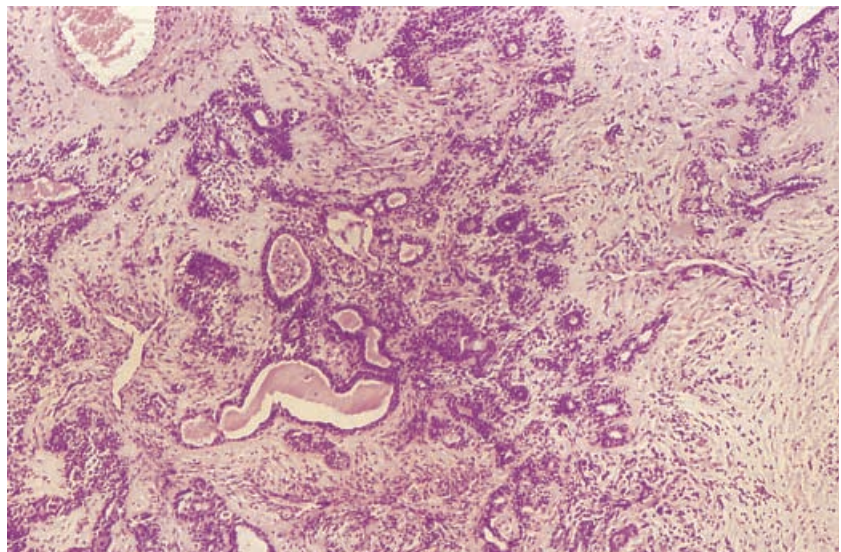
A 39-year-old Taiwanese male presented to our institution with a rubber-like, painful circumscribed lesion, measuring about 1.3-cm in diameter, in his left preauricular area. The medical history was unremarkable. No other abnormalities were found on further examination. Routine laboratory investigations were normal. A computerized tomographic scan of the head and neck demonstrated a well-defined nodular mass within the left parotid gland (Figure 4). The scan also revealed that the mass had a peripheral rim of enhancement and a low attenuation center, suggestive of PA with central necrosis or malignant transformation (Figure 4). Subsequently, the entire tumor was removed under general anesthesia with lobectomy of the involved parotid gland. The postsurgical period was uneventful. Eighteen months after operation, the patient was healthy with no evidence of local recurrence.

Gross examination of the surgical specimen showed a yellow, necrotic center surrounded by a brown rim (Figure 5). Histologic examination revealed a well-limited lesion demonstrating central necrosis (Figures 6 and 7) with residual viable PA tissue comprising epithelial and myoepithelial cells in a connective tissue stroma (Figure 8). Immunohistochemical findings revealed that some of the epithelial tumor cells were positive for keratin and S-100 protein, while staining for desmin, myosin, glial fibrillary acidic protein, and carcinoembryonic antigen was negative. These microscopic pictures confirmed, therefore, the clinical diagnosis of parotid PA with central necrosis.

Discussion

From a review of the relevant English-language medical literature, with specific regard to the occurrence of

Figure 2 Case 1. Epithelial and myoepithelial cells in a hyalinized connective-tissue stroma (hematoxylin-eosin stained section, magnification $\times 40$)



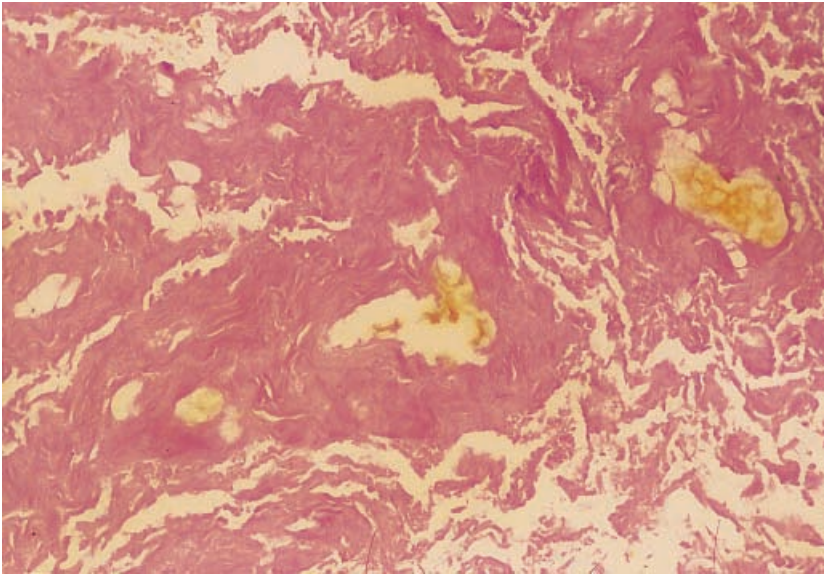


Figure 3 Case 1. Photomicrograph of the necrotic tumor mass (hematoxylin-eosin stained section, magnification $\times 100$)

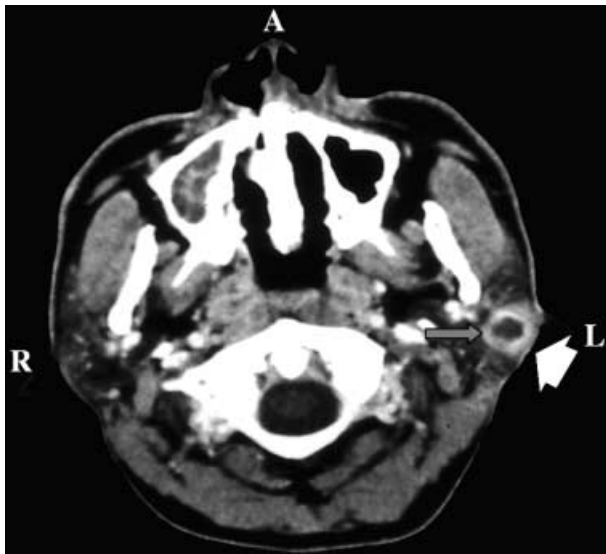


Figure 4 Case 2. Computerized tomographic scan demonstrating (arrow) a left intrapartoid well-defined nodular mass with a peripheral rim of enhancement and a low attenuation center

tumor necrosis of a PA, to the best of our knowledge, a total of 11 instances have been previously described (Layfield *et al*, 1992; Allen *et al*, 1994; Gottschalk-Sabag and Glick, 1995; Pinto *et al*, 1996; Li *et al*, 2000; Bayramoglu *et al*, 2001; Pabuccuoglu *et al*, 2001). These cases could be divided into two groups: spontaneous occurrence (six cases) and occurrence following FNA (five cases) (Table 1). The clinicopathological characteristics of these necrotic PAs (including our two cases) have been summarized in Table 1. Our case number two, undoubtedly, could be categorized into the spontaneous occurrence group because no surgical treatments before total excision of the tumor had been performed. Furthermore, our case number two represented only the second instance of spontaneous necrosis

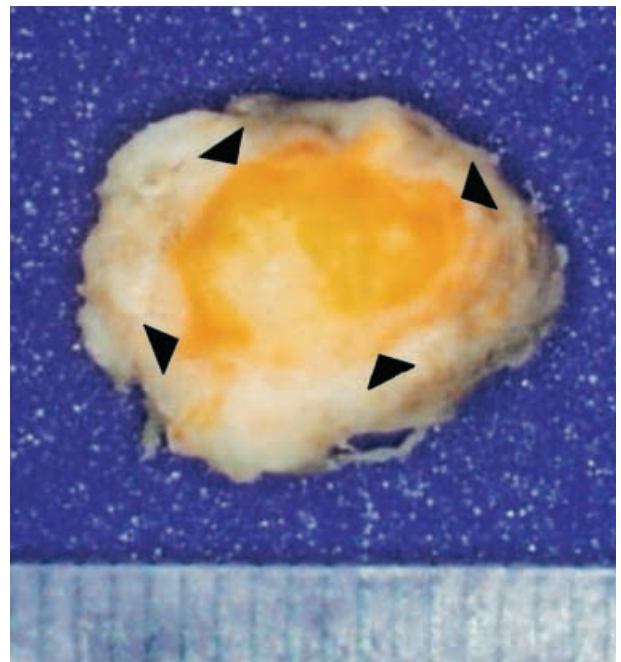


Figure 5 Case 2. Gross specimen showing yellow, necrotic center (arrows) surrounded by a brown rim

of PA arising in the parotid gland, the other cases having occurred in other glands. For our case number one, although no FNA has been performed, tumor necrosis occurred about 3 weeks following the incisional biopsy. Therefore, there are strong grounds for speculation that this case might be regarded as demonstrating tumor necrosis following incisional biopsy.

Central necrosis was generally a feature of all of the previously-reported cases, as well as our two cases, suggesting an ischemic or infarctive cause (Layfield *et al*, 1992; Allen *et al*, 1994; Gottschalk-Sabag and Glick, 1995; Pinto *et al*, 1996; Li *et al*, 2000; Bayramoglu

Figure 6 Case 2. Low-power view of the histologic section demonstrating central necrosis with a rim of viable tumor tissue (hematoxylin-eosin stained section, magnification $\times 40$)

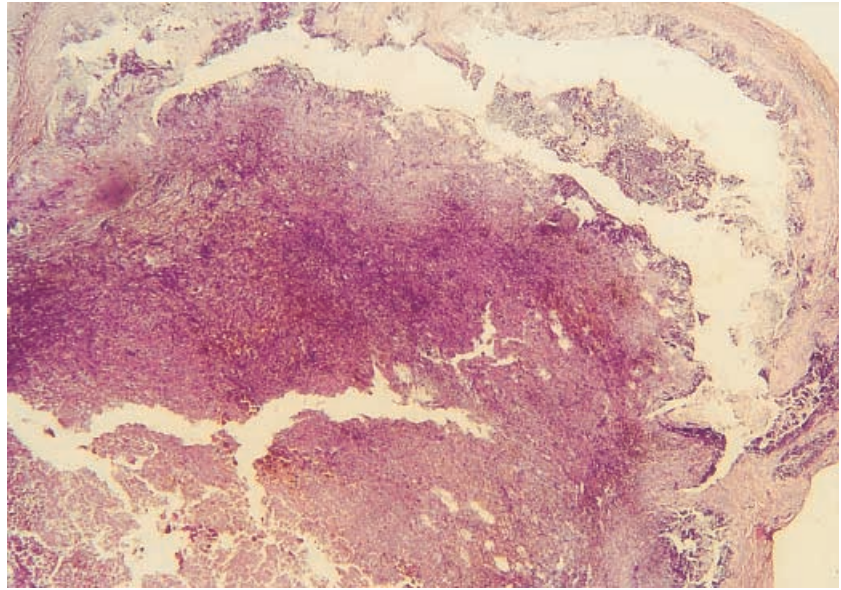
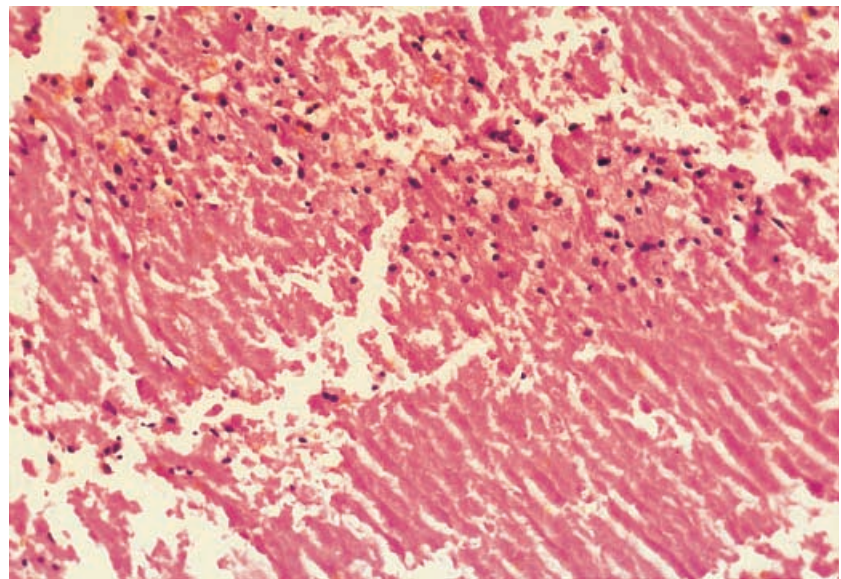


Figure 7 Case 2. High-power view of the histologic section demonstrating the area of central necrosis (hematoxylin-eosin stained section, magnification $\times 100$)



et al, 2001; Pabuccuoglu *et al*, 2001). However, the etiology and pathogenesis of necrosis in these lesions remain unclear. For those previously-reported cases of necrotic PA associated with FNA, the possible etiological factors suggested have been the interruption of the microvascular supply, a compromised vascular arising from the extraction of large amounts of tissue, and traumatic venous thrombosis and vigorous aspiration of tissue (Gottschalk-Sabag and Glick, 1995; Pinto *et al*, 1996; Li *et al*, 2000; Bayramoglu *et al*, 2001; Pabuccuoglu *et al*, 2001). For the present two cases, however, no FNA had been implemented, but an incisional biopsy was performed in our case number one instead. Although it remains a subject of some conjecture, perhaps analogous to the above-mentioned

effects associated with FNA, the incisional biopsy procedure performed in our particular case may have been responsible for localized ischemia in the tumor tissue, this resulting in tumor necrosis. However, this explanation does suffer from the drawback that incisional biopsy is almost a routine surgical practice in many dental clinics but, to the best of our knowledge, no similar phenomenon has been previously documented in the literature. On the other hand, in respect of the palatal tumor in this report, one might speculate that the large tumor mass could have exerted pressure on the greater or lesser palatine arteries as they leave the posterior palatine foramina, with consequent tumor necrosis (Allen *et al*, 1994). Furthermore, it is also possible that a large tumor mass as observed in our

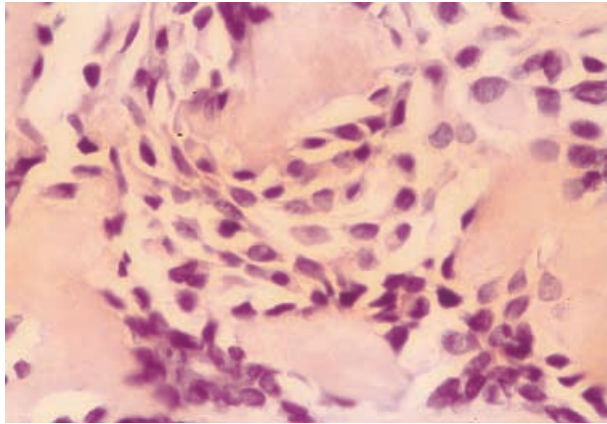


Figure 8 Case 2. Representative area of the peripheral viable tumor tissue showing epithelial and myoepithelial cells in a hyalined connective-tissue stroma (hematoxylin-eosin stained section, magnification $\times 100$)

case number one could outgrow its blood supply resulting in infarction. However, this factor is less likely to be applicable to our case number two which was less than 1.5-cm in diameter. Besides the above-mentioned local factors, Layfield *et al* (1992) reported a diabetic and myocardial infarction patient who suffered from spontaneous necrosis of a PA, suggesting that the systemic condition of that patient may have predisposed to ischemic necrosis of the tumor. No such systemic conditions could be identified in our two patients. Therefore, the precise etiology of the necrosis in our two cases was unclear and remains speculative.

Of interest, for those previously-reported cases of tumor necrosis of a PA associated with FNA (Gottschalk-Sabag and Glick, 1995; Pinto *et al*, 1996; Li *et al*, 2000; Bayramoglu *et al*, 2001; Pabuccuoglu *et al*, 2001), the region of necrosis had only been observed to have occurred in focal areas corresponding to the sites of FNA. On the other hand, in those previously-reported

spontaneous necrotic PA (Layfield *et al*, 1992; Allen *et al*, 1994), residual viable tumor tissues could be identified. Our case number one is somewhat unique in that the necrotic tumor mass was able to slip into the patient's oral cavity through the biopsy wound. Such phenomenon has not yet been reported in the literature, to the best of our knowledge. It may be speculated that the whole palatal tumor had already become somewhat necrotic and had experienced shrinkage subsequent to biopsying, prior to its emergence into the oral cavity. The sudden localized high pressure generated from the action of laughing vigorously may be one of the possible factors responsible for pushing the already necrotic and shrinking tumor mass out through the not-yet-completely healed biopsy wound and into the oral cavity. Furthermore, secondary involvement with the adjacent necrotic tissues may have enhanced the extrusion of the tumor. On the other hand, it should be noted that the appropriate therapy for a palatal PA of our case number one is not simple enucleation without anesthesia. It is understood that the patient refused further therapy, and such simple enucleation would be expected to leave residual tumor. Therefore, the patient will be followed-up at regular intervals for some time to come.

The present reported case number two represented an interesting clinicopathologic problem in differential diagnosis. The patient presented with a painful mass in the parotid gland, and radiologic and histologic evidence of necrosis could complicate the differential diagnosis. Although such necrosis certainly may be associated with malignancy, particularly in a PA (Boneu *et al*, 1998), such a finding should not be taken alone as a sign of malignant transformation (Layfield *et al*, 1992; Allen *et al*, 1994). The features that were highly suggestive of a benign process in our case number two included the well-circumscribed or encapsulated periphery, the lack of calcification in the tumor tissue and the absence of abnormal mitosis.

Table 1 Summary of the patients' clinical data of the necrotic pleomorphic adenoma

Cases	Age (year)/sex	Location	Size of lesion	Time interval between surgery and FNA/incisional biopsy
Gottschalk-Sabag and Glick (1995)	30/Male	Left submandible	2.5 cm	2 Week (FNA)
Pinto <i>et al</i> (1996)	30/Male	Left parotid	3 cm	1.5 Month (FNA)
Li <i>et al</i> (2000)	37/Male	Right parotid	1.5 cm	2 Week (FNA)
Bayramoglu <i>et al</i> (2001)	27/Female	Right parotid	1 cm	1 Month (FNA)
Pabuccuoglu <i>et al</i> (2001)	26/Male	Right parotid	2.7 cm	10 Days (FNA)
Present case 1	28/Male	Right palate	5 cm	3 Week (incisional biopsy)
Layfield <i>et al</i> (1992)	48/Male	Left parotid	2.5 cm	Spontaneous occurrence
Allen <i>et al</i> (1994)	34/Male	Right hard palate	2 cm	Spontaneous occurrence
Allen <i>et al</i> (1994)	36/Male	Right hard palate	Not stated	Spontaneous occurrence
Allen <i>et al</i> (1994)	23/Male	Left submandible	4 cm	Spontaneous occurrence
Allen <i>et al</i> (1994)	83/Female	Posterior hard palate	3 cm	Spontaneous occurrence
Allen <i>et al</i> (1994)	25/Female	Soft palate	1 cm	Spontaneous occurrence
Present case 2	39/Male	Left parotid	1.3 cm	Spontaneous occurrence

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