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Case report

Clinicopathological Features of Carcinoma Ex Pleomorphic Adenoma of Parotid gland: A Rare Case Report from Libya

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Abstract
Carcinoma ex pleomorphic adenoma (CXPA) is a rare malignant tumor arising from a primary or recurrent benign pleomorphic adenoma (PA) of the parotid gland. CXPA poses diagnostic challenges, and histological analysis remains the most reliable method for accurate diagnosis. The malignant component of CXPA can appear in a variety of forms including salivary duct carcinoma (SDC). Here, we present a case of CXPA originating from the parotid gland and discuss its clinicopathological features. This case report contributes to the limited literature on CXPA in the Libyan population.
Keywords. *Carcinoma ex pleomorphic adenoma, parotid gland tumor, histopathology, salivary duct carcinoma.*

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INTRODUCTION

The majority of benign parotid gland tumors, which make up around 50% of all parotid tumors, are pleomorphic adenomas, also known as benign mixed tumors. It contains elements of the epithelium, myoepithelial, and mesenchymal types in different quantities. In about 6% of PA, a carcinoma ex pleomorphic adenoma emerges [1]. CXPA is defined as a carcinoma originating from a primary (de novo) or recurrent benign pleomorphic adenoma; it occurs in between 5 and 25 % of parotid carcinomas [2,3].
Uncertainty exists regarding CXPA's pathogenesis. There are two proposed hypotheses. One is that they are malignant from the onset, while others believe it to be a carcinomatous transformation of a mixed tumor [4]. Preoperative diagnosis of the entity is challenging, and the most accurate method of diagnosis is histological analysis. The malignant element of CXPA most frequently manifests as adenocarcinoma not otherwise specified (NOS), but it can also occur in the form of salivary duct carcinoma (SDC), undifferentiated carcinoma, adenoid cystic carcinoma, or mucoepidermoid carcinoma [5-7].
A high-grade adenocarcinoma known as SDC develops from the excretory ductal epithelium of the main salivary glands, mainly the parotid gland. SDCs closely resemble ductal carcinoma of the breast histopathologically, with intraductal and infiltrating components. While many cases of SDC arise within pleomorphic adenomas due to malignant transformation of ductal epithelial cells, reports indicate that multifocal SDCs can originate from major excretory ducts close to a pleomorphic adenoma [8,9]. Here we report a case of carcinoma ex pleomorphic adenoma, which originated from the parotid gland and focus on clinicopathological features of this tumor, as a rare case reported in Libya.

Case presentation

A 39-year-old Libyan man presented with right side parotid mass that noticed incidentally since few weeks back, no any associated symptoms as pain, fever, or facial nerve dysfunction. On examination there is a firm oval mass close to the posterior margin of deep lobe of parotid gland, overlying skin was normal, and no lymphadenopathy. High resolution ultrasound of neck revealed well defined oval shaped hypoechogenic mass close to posterior margin of deep portion of right parotid gland. Magnetic Resonance Image (MRI) examination of the neck revealed sharply circumscribed solid mass in the deep aspect of the right parotid gland measured 2x1.5cm which was isointense to muscle on T1, and hyperintense on T2 (figure 1).

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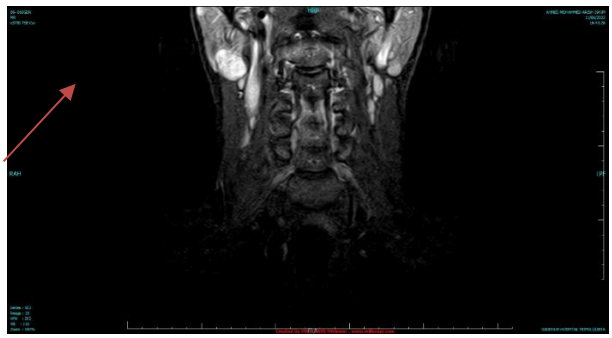

Figure 1. Coronal T2-w MRI shows a hyperintense lesion of right parotid (arrow).

Fine needle aspiration cytology (FNAC) of the Rt. parotid mass was performed, which showed a mixture of myoepithelial cells, ductal cells and characteristic fibrillary borders, with bright magenta color extracellular stroma. No malignant cells seen. The patient underwent total right parotidectomy, and the specimen was sent for histopathological analysis. Gross examination showed one tissue mass (salivary gland) measured 4.5x2.5x1cm, weighted 9g, greyish brown in color, oval in shape and soft to firm in consistency. Serial sectioning of specimen showed homogenous white nodule measured 1.5x1.2 cm (figure 2).

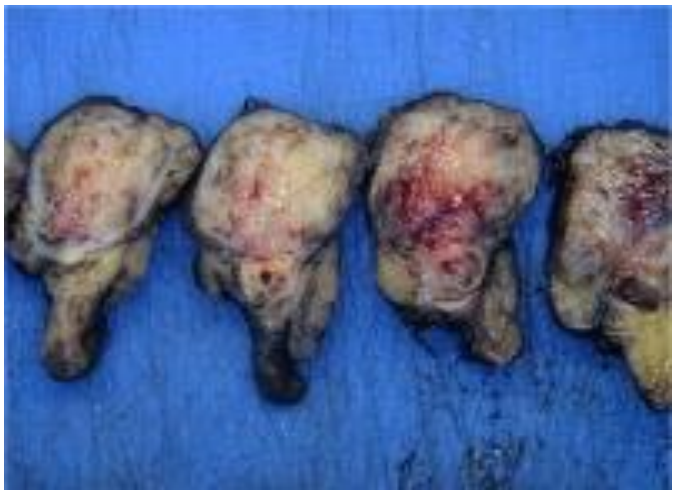

Figure 2. Gross cutup shows capsulated nodule with heterogeneous white to gray surface, and hemorrhagic areas.

Histopathology of the resected tumor revealed malignant proliferation of pleomorphic cells with eosinophilic cytoplasm, exhibiting solid, tubular and cribriform growth patterns. Pre-existing PA were recognized by benign epithelial ductal elements embedded in myxometous stroma with myoepithelial cells, no lymphovascular or perineural invasion was identified (figure 3-5).

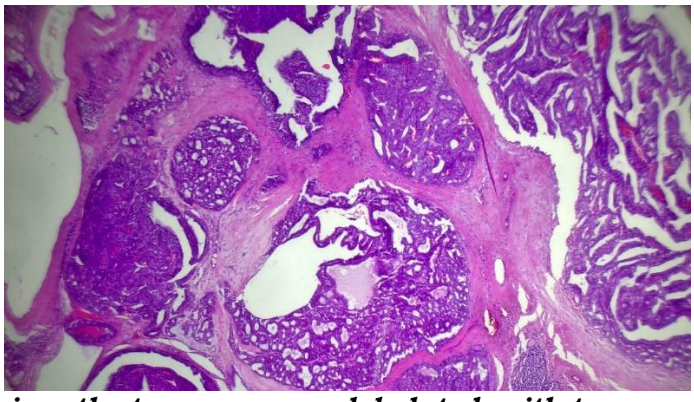

Figure 3. At low power view, the tumor appears lobulated, with tumor cells arranged in tubular, cribriform, and solid patterns, as observed through hematoxylin and eosin (H&E) staining.

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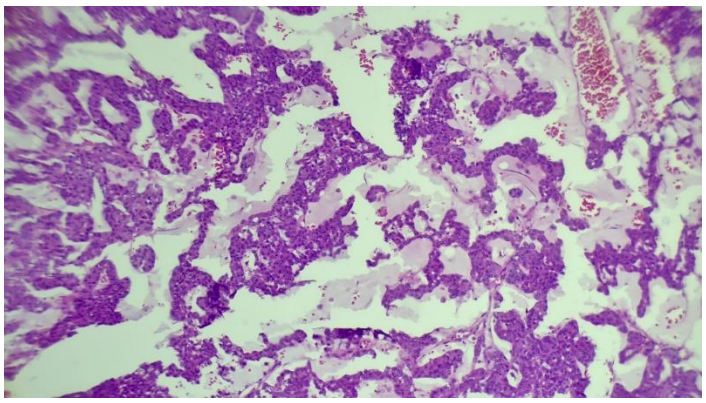

Figure 4. The section of the tumor shows a pleomorphic adenoma composed of a biphasic population of cells within a myxoid matrix (H&E stain).

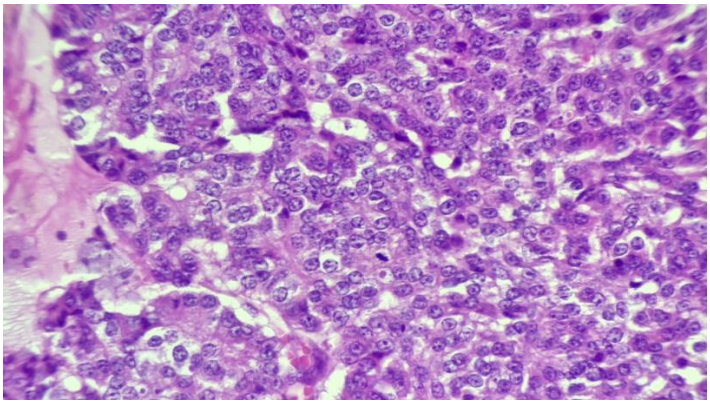

Figure 5: The section of the tumor shows salivary duct carcinoma (SDC) with a solid growth pattern. The tumor cells appear polygonal to oval, with a moderate amount of eosinophilic cytoplasm. They exhibit vesicular nuclei with prominent nucleoli and demonstrate abnormal mitotic activity (H&E staining).

The diagnosis of carcinoma ex pleomorphic adenoma with salivary duct carcinoma component was done. The pathologic staging was determined to be T1N0Mx. After the surgery, the patient received radiation therapy and remained on regular follow-up for monitoring recurrence and metastasis.

Discussion

Carcinoma ex-pleomorphic adenoma represents about 11% of all salivary gland malignant neoplasms, with a prevalence incidence of about 5.6% per 100,000 malignant tumors [1,2]. It affects primarily the major salivary glands especially the parotid and submandibular glands, although cases have been reported in the minor salivary glands, and other sites such as the breast, lacrimal gland, trachea, and nasal cavity [1,10].
The exact pathogenesis of CXPA is still debated. Some theories suggest that these tumors are malignant from the onset, while others propose a carcinomatous transformation of a pre-existing benign mixed tumor [11]. A PA's probability of developing cancer and becoming a CXPA rose with longer preoperative time, the incidence of malignant transformation rose from 1.6% for tumors with a clinical duration of less than 5 years to 9.6% over the course of 15 years [12].
CXPA commonly presents as a firm mass in the salivary gland region. Other clinical features may include pain, facial nerve palsy, enlarged lymph nodes, skin ulceration, and dysphagia, especially if the tumor invades adjacent structures. However, CXPA can also be asymptomatic and resemble benign pleomorphic adenomas, making preoperative diagnosis challenging [4,5].
The tumor primarily affects people in their sixth to eighth decades of life, and females are somewhat more likely to develop it [13]. Our case was male of 39 years old, the main complaint was painless parotid mass. FNAC is the most pre-operative technique for diagnosing CXPA. The main disadvantage of FNAC is weak sensitivity which is attributed to sampling error rather than inaccurate interpretation of cytological smears. Most false-negative finding was misdiagnosed as PA [14]. However, there are no pre-operative techniques that may be used alone for CXPA diagnosis [15]. The most accurate method for diagnosing CXPA is by a histopathological analysis. The histopathological features of CXPA is including both benign PA and

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malignant components, the malignant component usually of high grade and have histological feature similar to their de novo counterparts.14 In 2005 World Health Organization (WHO) classified CXPA on the basis of the degree of invasion of the carcinomatous component outside the fibrous capsule into: (a) non-invasive, (b) minimally invasive <1.5 mm penetration of malignant element into extracapsular tissue, and (c) widely invasive greater than 1.5 mm invasion from tumor capsule into neighboring tissues [14,15]. In our case the carcinomatous component was salivary duct carcinoma with the presence of preexisting pleomorphic adenoma component, no lymphovascular or perineural invasion was identified.

Ablative or radical surgery, such as parotidectomy, is the primary treatment option for CXPA. The extent of surgery depends on the invasion depth and location of the tumor. Superficial parotidectomy may suffice for non-invasive or minimally invasive cases, while total or radical parotidectomy is indicated for more invasive tumors [14].

The role of postoperative radiation is controversial but may be considered, particularly in cases of high-grade cancer or extensive invasion [7,14]. There is limited evidence regarding the efficacy of chemotherapy in CXPA treatment, but it may be used in cases of distant metastasis, often in conjunction with radiotherapy [7,14]. Our patient treated by total parotidectomy followed by radiotherapy.

Conclusion

Carcinoma X pleomorphic adenoma is a rare entity, with considerable clinical and pathological significance. Clinicians should maintain a high index of suspicion for CXPA, as preoperative diagnosis can be difficult due to overlapping clinical and histological features with benign pleomorphic adenomas. Multidisciplinary management involving surgery, radiation therapy, and potentially chemotherapy is essential for optimal patient outcomes.

Conflict of interest. Nil

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