Adenoid cystic carcinoma of lacrimal gland: A case report.

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Abstract:

Adenoid cystic carcinoma is a rare tumour that represents less than 2% of all malignant tumours of the head and neck. It is primarily a tumour of adulthood with a peak incidence defined in the fourth to sixth decade of life. The onset of development is usually marked by exophthalmos or ptosis. Pain is frequent: a sign of carcinomatous involvement especially if it is associated with hypoaesthesia in the territory of the frontal nerve. The duration of symptoms is generally less than 6 months. The five histological patterns are: Basaloid (worst prognosis), sclerosing, cribriform, tubular and comedo carcinoma. We report a case of 35 year old male patient having left eye proptosis with upper lid ptosis and restricted eye movements diagnosed as having Adenoid Cystic Carcinoma of the lacrimal gland on the basis of histopathological examination. We describe its features and aggressive treatment approach which ensures appropriate management.

Key Words: Adenoid cystic carcinoma, Basaloid, Cribriform, Lacrimal gland, Tubular.

Introduction:

Lacrimal gland tumors can be inflammatory or neoplastic. Amongst the epithelial tumors, 50% are pleomorphic adenoma and 25% are adenoid cystic carcinoma.[1] Adenoid cystic carcinoma (ACC) is the most common form of malignant epithelial tumor of the lacrimal gland.[2] It is primarily a tumor of adulthood with a peak incidence defined in the fourth to sixth decade of life and with a slightly higher preponderance in females. The incidence of adenoid cystic carcinoma of lacrimal gland is 0.108 per million per year.[3] The onset of development is usually marked by exophthalmos or ptosis. Pain is a sign of carcinomatous involvement especially if it is associated with hypoaesthesia in the territory of the frontal nerve.[4] The duration of symptoms before the first consultation is generally less than 6 months. Radiological imaging is an essential examination for the assessment of extension. It shows the tumor at the level of the lacrimal space, its measurements, margins of the lesions which may appear irregular, existence of bone erosion which may be early, and the presence or not of calcifications. Only the histopathological examination allows a definite diagnosis. Histopathologically, adenoid cystic carcinoma is typically nonencapsulated with infiltration of surrounding orbital fat and muscle. Its five types are: cribriform or swiss cheese (most common), solid (basaloid),

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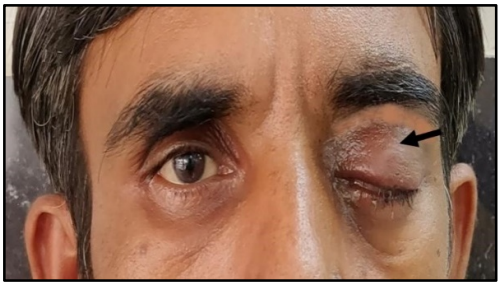
tubular, sclerosing and comedocarcinoma. Histologic subtype and histologic grade are amongst the two important prognostic factors. Several studies report a favorable prognosis for the tubular and sclerosing form of ACC than for the solid type. Perineural invasion has been identified as an unfavorable prognostic factor. We report a case of 35 year old male patient who presented with proptosis , ptosis and restricted movements of left eye with retrobulbar mass involving intraconal and extraconal compartment with lacrimal fossa encasing optic nerve sheath diagnosed as adenoid cystic carcinoma of lacrimal gland on histopathology and immunohistochemistry. We describe its features and aggressive treatment approach which ensures appropriate management.

Case report:

A thirty five year old male presented to our outpatient department with protrusion of left eye and drooping of upper eyelid since 1 month. (Image 1) It was sudden in onset, rapidly increasing in size and associated with diminution of vision. There was no history of trauma, foreign body, fever, weight loss or any systemic symptoms. Patient was a chronic tobacco chewer. The best corrected visual acuity of left eye was 3/60 and of right eye was 6/6. On examination there was left eye proptosis and complete ptosis. Downward and inward deviation of the eyeball with restricted ocular motility in all directions of gaze was noted. The pupil was semidilated with presence of relative afferent pupillary defect.On fundus examination of left eye there was optic disc edema with blurring of disc margins; rest of the findings were within normal limits. The anterior segment and fundus findings of right eye were within normal limits. Intraocular pressure of both the eyes was normal.

Image 1: Gross image showing left eye proptosis and ptosis



Computed Tomography (CT) scan brain and orbit revealed a large left sided retrobulbar mass involving intraconal and extraconal compartment with lacrimal fossa encasing optic nerve sheath which was suggestive of primary or secondary neoplasm. (Image 2)

On the basis of radiological findings, the patient was advised incisional biopsy of the left eye for histopathological examination of the mass. Basic blood investigations including cell counts, renal function tests, liver function tests and chest X-ray were within normal limits. Screening tests for HIV and HBsAG were negative. Incisional biopsy was done under local anaesthesia from the retrobulbar mass and on histopathological examination, there were many infiltrating nests of basaloid angulated hyperchromatic cells forming cribriform, tubular and solid pattern surrounded by fibrous stroma with comedonecrosis which was suggestive of adenoid cystic carcinoma of lacrimal gland. (Image 3).

Image 2: CT scan (Brain+ Orbit) showing large left sided retrobulbar mass involving intraconal and extraconal compartment with lacrimal fossa encasing optic nerve

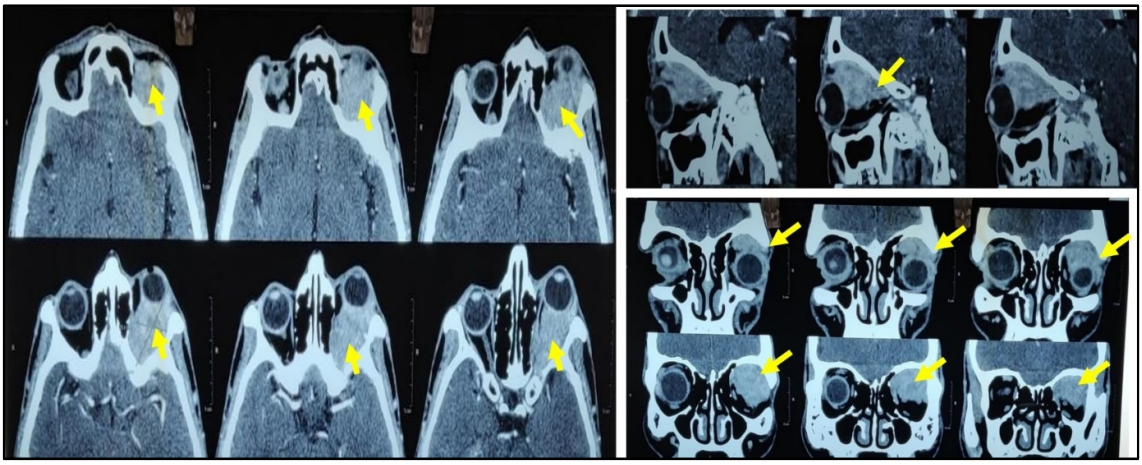


Image 3: Histopathology of Lesion

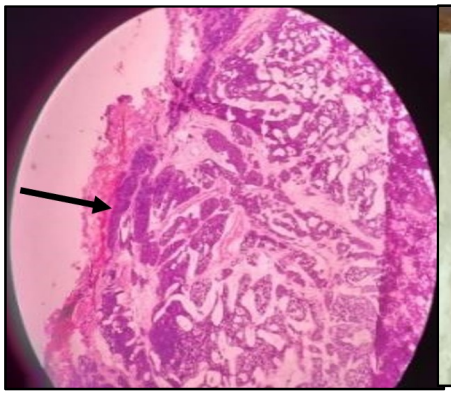
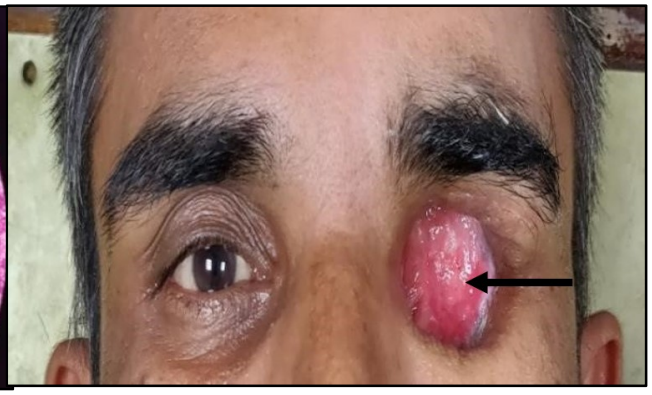


Image 4: Post-operative after 3 months showing healthy granulation tissue of left orbit.



The findings were confirmed by the immunohistochemistry markers. Pankeratin, Vimentin, Cytokeratin 7 were diffusely expressed and Epithelial Membrane Antigen(EMA), C-kit, p53 and Ki-67 were focally expressed.The patient was operated for left eye orbital exenteration with an explained nil visual prognosis under general anesthesia and was advised postoperative radiotherapy. The patient did not have any local recurrence during 3 months of follow up.

Discussion:

Malignant neoplasms constitute 50% of primary epithelial tumours of the lacrimal gland. The most frequently encountered is adenoid cystic carcinoma comprising approximately 20–30%, whereas carcinoma ex pleomorphic adenoma constitutes approximately 10%, adenocarcinoma (de novo) 5–10% and mucoepidermoid carcinoma 1–2%.[5]

Pleomorphic adenoma usually occurs in 4th decade with no gender predilection. Histopathologically, pleomorphic adenoma is usually a well-defined tumour, characterized by a proliferation of both epithelial and mesenchymal components. Adenoid cystic carcinoma has a bimodal distribution with the majority of patients diagnosed in 4th decade and a smaller peak of patients diagnosed in the teenage years.The duration of symptoms before first

ophthalmic consultation is approximately 6 months. The mass has irregular margins, nodularity, infiltration of adjacent tissue, calcification and bone destruction.

Histopathology of adenoid cystic carcinoma reveals it as malignancy of modified myoepithelial (abluminal) and ductal (luminal) differentiated cells. It is distinguished from other lacrimal gland tumours of similar cellular composition by characteristic cytomorphological features and three histological growth patterns: the cribriform ('Swiss cheese' or sieve-like), solid and tubular forms, seen in varying combinations and dominance. The cribriform pattern is the most common, while the solid pattern is least frequent. However, there is usually a mixture of patterns within a single neoplasm. The predominant growth pattern influences the biological behaviour and prognosis. In the tubular and solid adenoid cystic carcinoma, basaloid myoepithelial cells dominate; particularly, in the latter subtype, there is a scarcity or absence of glycosaminoglycan and basal lamina-containing cyst-like spaces. The neurotrophic infiltrative pattern of adenoid cystic carcinoma is a hallmark of these tumours and contributes to the intractable nature of this disease. The tumor has the tendency of local invasion, metastasis (to lungs, brain and bone), intracranial spread and recurrence. Recently, a specific chromosomal translocation t(6;9) leading to fusion between the oncogene MYB and the transcription factor gene NFIB, with an overexpression of the oncogene MYB, was discovered in adenoid cystic carcinoma of the head and neck including one case in the lacrimal gland.[5] The consequence of the MYB-NFIB fusion is activation of genes associated with apoptosis, cell cycle control, cell growth, angiogenesis and cell adhesion. The fusion, thereby, seems to play an important role in the oncogenic process of adenoid cystic carcinoma and has potential as a molecular therapeutic target. The tyrosine kinase receptor c-kit (CD117) is expressed in over 90% of adenoid cystic carcinoma.

Carcinoma ex pleomorphic adenoma is considered to be a carcinoma that shows histological evidence of arising in or from a benign pleomorphic adenoma. Adenocarcinoma usually occurs in 5^{th} decade and is more common in males as compared to females. Mucoepidermoid carcinoma also affects 5^{th} decade and is more common in females as compared to males. The current line of management of adenoid cystic carcinoma involves orbital exenteration along with radiation therapy/adjuvant chemotherapy to decrease the chances of the recurrence. Rawat P et al. reported a case of a female in her 30's who presented with gradually increasing painless abaxial proptosis of right eye since two and a half years. She underwent a lateral orbitotomy and tumor debulking procedure followed by post operative radiotherapy.[6] Histopathological analysis revealed basaloid cells with cribriform pattern which is the hallmark of adenoid cystic carcinoma. Han J et al. had reported that eye sparing surgery with adjuvant radiotherapy demonstrated a favorable local control and long term survival outcomes in patients with orbit confined adenoid cystic carcinoma.[7] Hung JY et al**.** highlighted the aggressive nature of adenoid cystic carcinoma of lacrimal glands.[8] Eye-sparing surgery with adjunctive radiotherapy may achieve relatively optimal disease control in early stages but in advanced disease metastasis and mortality are usually inevitable. Local recurrence is common occurring in nearly half of the patients within 2 years with soft tissues or bone as the most frequentsite. Planned combination of surgery with postoperative radiotherapy have shown improvement in both local control and survival.In our patient we have carried out left orbital exenteration followed by post operative

external beam radiotherapy. The patient did not have any local recurrence during 3 months of follow up. However, a longer follow up is required to determine the prognosis.

Conclusion:

This case report highlights how to diagnose and manage a case of adenoid cystic carcinoma of lacrimal gland**.** Management should be comprehensive with a dedicated team of ophthalmologist, oncologist and radiotherapist aggressively managing the condition. These patients should be followed up for life to rule out recurrence, metastasis and treatment-related malignancies.

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