CASE REPORT

Mucoepidermoid Carcinoma of Parotid as a Second Malignancy in Acute Lymphoblastic Leukemia

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Background: Improved survival seen in Acute Lymphoblastic Leukemia (ALL) cases has led to increased reports of second malignant neoplasms. **Case characteristics:** A 12-year-old female treated for ALL using UK ALL XI protocol nine years back presented with progressively increasing pre-auricular swelling. **Observation:** Investigations revealed it to be a Mucoepidermoid carcinoma. **Message:** Mucoepidermoid carcinoma should be a differential in any parotid swelling of treated case of pediatric ALL.

Keywords: *Complication. Recurrence, Second Malignant Neoplasm*.

The most common Second Malignant Neoplasm (SMN) developing after Acute Lymphoblastic Leukemia (ALL) are central nervous system (CNS) tumors followed by Acute myeloid leukemia/Myelodysplastic syndrome [1, 2]. Some reports of SMN in form of salivary gland Mucoepidermoid carcinoma (MEC) in treated ALL patients have been published. We report development of the same in an ALL case treated by United Kingdom ALL XI (UK ALL XI) protocol, which does not entail CNS radiation as a form of CNS prophylaxis.

Case Report

A 12-year-old female who was a treated case of B precursor ALL (9 years back), presented with progressively increasing pre-auricular swelling for 15 days. Examination revealed that the swelling arose from parotid and was not associated with facial nerve palsy.

Fine Needle Aspiration Cytology revealed cellular smears with oval to elongated cells having bland nuclei lying singly and in groups in a myxoid/mucin rich background. A possibility of a pleomorphic adenoma was suggested (***Fig.* 1a**). Contrast-enhanced computed tomography (CECT) of Face and Neck showed an ill-defined heterogeneously enhancing lesion involving both the lobes of right parotid gland, likely malignant in etiology. (***Fig.* 1 b** and **1 c**). Additionally, on PET CECT Scan, an FDG - avid heterogenous solid cystic parotid mass measuring 3.4x2.8 cm was seen.

Treatment records showed that standard UK ALL XI protocol chemotherapy (1992) was administered without any cranial irradiation. Instead, intravenous and intrathecal Methotrexate along with folinic acid rescue was given for CNS prophylaxis. Patient remained in complete remission throughout treatment duration of 3 years and the bone marrow was in remission during the present admission also.

Right total parotidectomy with facial nerve end-to-end anastomosis was performed. The pathological diagnosis was Mucoepidermoid Carcinoma, Grade II.

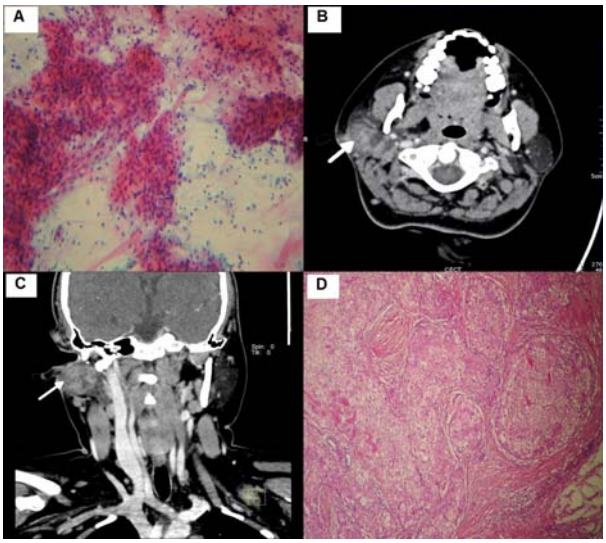

Fig. 1 *(a) Cytology smear shows oval to elongated cells with bland nuclei lying singly and in groups in a mucin rich/myxoid background. Pap stain (10x) (b) Axial and (c) coronal CECT image showing heterogeneously enhancing lesion involving both the lobes of right parotid gland. (d) nests of mucus and intermediate cells lying in pools of mucin. H & E (10x).*

The histology section showed tumor nests composed of mucus, intermediate and squamoid cells in variable combinations lying in pools of mucin (***Fig.* 1d**). All resected lymph nodes were free of tumor. Margins could not be ascertained as the tumor was removed piecemeal.

Repeat CECT of face and neck, five weeks post-surgery revealed a residual heterogeneously enhancing tumor in right parotid region, with invasion of the right temporal bone posteromedially. Multidisciplinary team decided against surgical intervention and opted instead for radiation therapy with Intensity Modulated Radiation Therapy (IMRT) technique. The patient received a total dose of 54 Gy over a period of one-and-half months. She remains disease-free, 26 months post-surgery and 23 months post-radiotherapy.

DISCUSSION

Mucoepidermoid carcinoma developing as a second malignant neoplasm is uncommon with only 19 cases reported following successful treatment of childhood ALL [1,3-10] (***Web Table* I**). It was found that the most common site was parotid gland, with only a single case developing from minor salivary gland of cheek. The MEC occurred as the second malignancy, 8.1 years (mean) after the initial leukemia diagnosis.

All previously reported 19 patients diagnosed as ALL were treated by multi-drug chemotherapy along with either intrathecal methotrexate and prednisolone or cranial irradiation. Eight out of these 19 cases, had received MDC along with cranial irradiation, and most had received a dose of 18Gy [1,3,6,9,10]. Total Body Irradiation was also given in another three cases along with MDC [5, 9]. Six cases had received multi-drug chemotherapy without any radiotherapy [4,7,9,]. This is in keeping with our case, highlighting possible role of MDC, in addition to the known role of radiation in development of MEC in treated ALL cases. The risk factors for development of second malignant neoplasm. include radiation to the craniospinal axis, ALL with CNS involvement, relapse of primary disease, female sex and epipodophyllotoxins as frontline agent [1,2]. Our case exhibited the latter two risk factors, with etoposide having been administered. Cyclophosphamide use has also been proposed as a risk factor [9], but without adequate evidence.

Mucoepidermoid carcinoma are usually low grade, and misdiagnosed on FNAC [3,4,6-9]. Most reported patients were alive and free of disease after treatment of MEC regardless of histological grade [1,3-9]. This reinforces the importance of timely and correct diagnosis of this malignant neoplasm so that early surgical treatment can be instituted.

To conclude, mucoepidermoid carcinoma even though rare, should always be kept as a differential in any parotid region swelling of a treated case of pediatric ALL as these SMN's are mostly low grade and very much amenable to treatment thereby increasing the chances of survival in young patients.

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