Case Report

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An Elusive Case of Pleural Effusion

Internal Medicine Section

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ABSTRACT

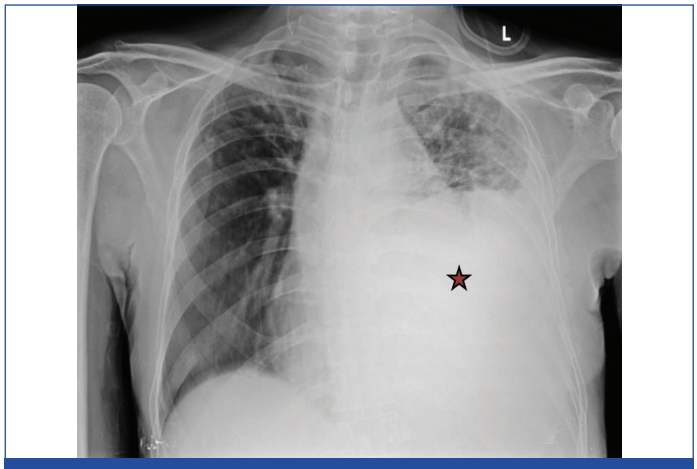
The incidence of distant metastasis in head and neck Squamous Cell Carcinoma (SCC) is relatively low. The most frequently involved sites for distant metastasis are lungs, followed by bone and liver. The most important predictive factors for distant metastasis appear to be site of the primary tumour (hypopharynx), advanced T&N classification, locoregional control and histologic grade. A 61-year-old male, chronic smoker, presented with complaints of Grade 4 mMRC (Modified Medical Research Council) dyspnoea. He had left-sided buccal mucosal SCC (locally advanced) and was on palliative chemotherapy. He had undergone treatment for pulmonary tuberculosis seven years back. He was tachypneic and clinical examination revealed absent breath sounds in the left hemithorax. Chest radiograph showed a massive left pleural effusion which was found to be exudative after therapeutic thoracocentesis. Cytology tests were negative for malignant cells. Positron Emission Tomography (PET) scan showed uptake along the left pleura (SUV Max-5.06) and left buccal mucosa (SUV Max -4.1). Thoracoscopic frozen section pleural biopsy revealed metastatic squamous cell carcinomatous deposits in the pleura. On table pleurodesis was done with doxycycline. The patient was continued on palliation with no recurrent effusion. However, he succumbed to the disease after four months. This case report describes a rare case of malignant pleural effusion from a primary buccal mucosal SCC without any concurrent lung involvement.

Keywords: Buccal mucosal carcinoma, Dyspnoea, Pleural biopsy, Pleural metastasis, Pleurodesis, Squamous cell carcinoma

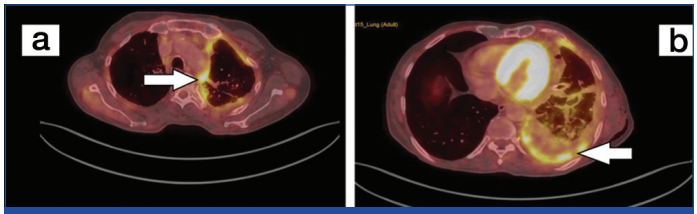
CASE REPORT

A 61-year-old male presented with complaints of Grade 4 mMRC dyspnoea. He was a known case of left-sided buccal mucosal SCC (locally advanced) on palliative chemotherapy. His past medical history revealed he had undergone treatment for pulmonary tuberculosis seven years back. He was a chronic smoker (40 pack years). He was also a diabetic with poor gylcaemic control due to poor compliance.

Clinical examination revealed Grade 4 mMRC dyspnoea with a room air oxygen saturation of 91%, blood pressure of 120/70 mmHg and heart rate of 67 beats/min. Auscultation revealed absent breath sounds in the entire left hemithorax. There was no evidence of pedal oedema or calves tenderness. In view of falling oxygen saturations, patient was stabilised with non invasive ventilation in an intensive care setting and he was prepared for a therapeutic thoracocentesis. The initial haemogram was normal. Serum biochemistry showed glucose level of 368 mg%, urine acetone was negative and he was started on human insulin infusion. Electrocardiogram (ECG) revealed sinus tachycardia and chest radiograph was notable for a massive left-sided pleural effusion [Table/Fig-1]. Ultrasound duplex of the lower extremities was normal. The recently noted massive left-sided pleural effusion was not evident on a previous chest X-ray performed three weeks earlier indicating a new finding. A litre of straw-coloured fluid was drained through thoracocentesis. Pleural fluid analysis showed cell count of 459 nucleated cells/μL with lymphocyte predominance (83%), low Adenosine Deaminase (ADA), lactate dehydrogenase of 142 units/L and total protein of 5.4 g/dL suggesting an exudative effusion. Pleural fluid gram stain and bacterial cultures were negative. Cytology was negative for malignant cells. PET scan revealed a Fluorodeoxyglucose (FDG) avid uptake along the left pleura with a SUV Max of 5.06 [Table/Fig-2a,b] and massive pleural effusion. There was notable mediastinal lymphadenopathy and increased uptake (SUV Max -4.1) in the left buccal mucosal lesion.



[Table/Fig-1]: Chest X-ray posteroanterior (PA) view showing left massive pleural effusion with mediastinal shift indicated by the star in the chest X-ray.

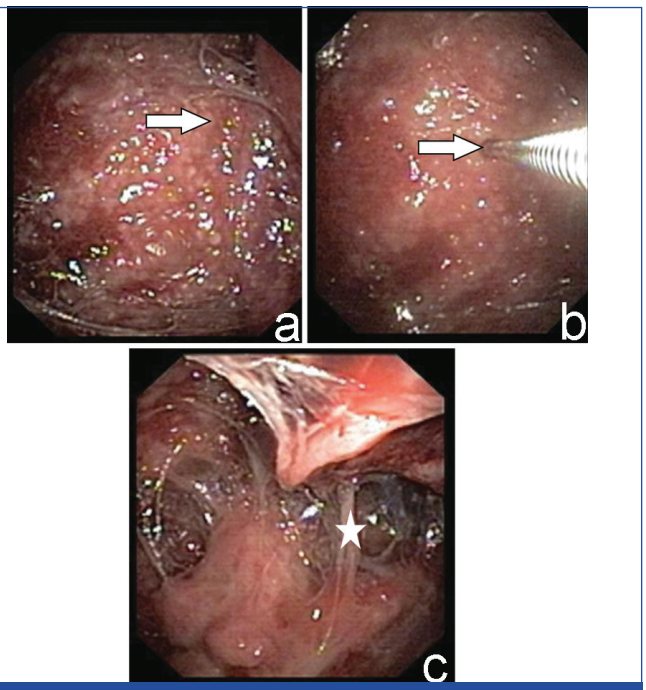


[Table/Fig-2]: a,b) PET-CT showing new FDG avid nodules showing uptake in the pleura as indicated by the white arrows.

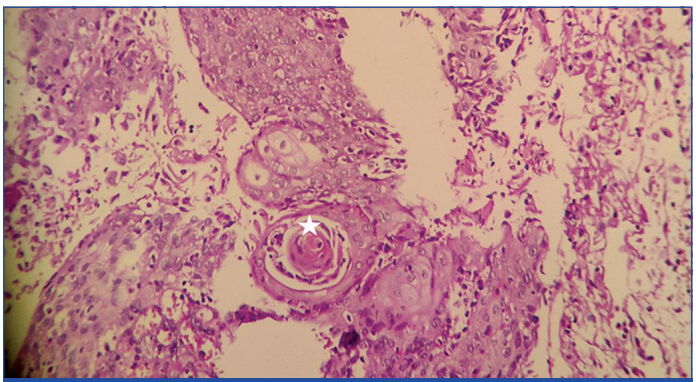
A provisional diagnosis of a left-sided massive pleural effusion probably malignant in aetiology was made. Differential diagnosis included tuberculous pleural effusion and para pneumonic effusion. Thoracoscopy revealed multiple hard nodules [Table/Fig-3a] in the parietal pleura from where multiple biopsies [Table/Fig-3b] were taken and sent for frozen section. Multiple dense adhesions were also noted [Table/Fig-3c]. Frozen section revealed cores of fibrous tissue showing infiltrating tumour cells arranged in nests with occasional keratin pearl formation suggestive of metastatic SCC deposits. Histopathology confirmed neoplastic tissue arranged in sheets with nuclear pleomorphism, hyperchromasia, increased mitotic rate with desmoplastic stromal reaction and individual cells have distinct cell border with abundant eosinophilic cytoplasm,

vesicular nucleus with prominent nucleoli [Table/Fig-4a-c]. Without any further delay, on table doxycycline pleurodesis was performed. Post procedure intercostal chest drain was monitored serially which showed a remarkable improvement with decreasing drainage. Hence, the chest drain was removed after 10 days and he was discharged on palliative care with no recurrent effusion.

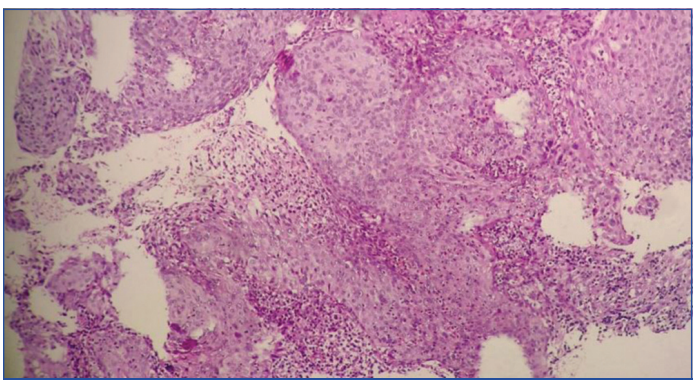
Ever since the initial diagnosis of oral SCC, the patient had failed chemotherapy multiple times and the patient's hospital course was complicated by uncontrolled diabetes mellitus. The absent re-accumulation of pleural effusion pointed towards a successful pleurodesis. Despite the best efforts he succumbed to cancer cachexia secondary to his primary disease four months later.



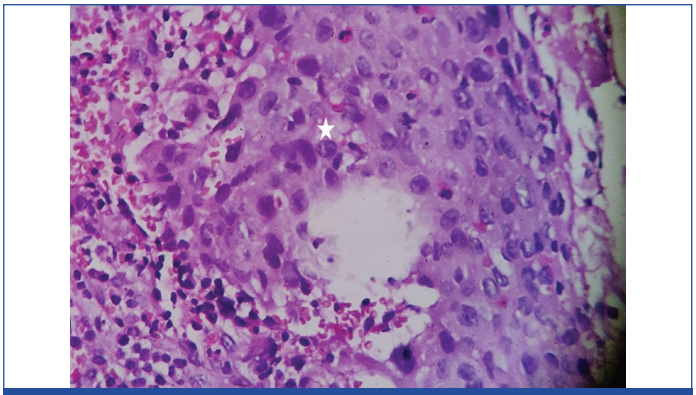
[Table/Fig-3]: Thoracoscopic image showing: a) Hard pleural nodules indicated by the white arrow. b) Pleural biopsy of the hard nodule indicated by white arrow. c) Dense pleural adhesions indicated by white star.



[Table/Fig-4a]: Showing occasional keratin pearl (white asterisk) formation suggestive of metastatic squamous cell carcinoma deposits (moderately differentiated) (H&E,10X).



[Table/Fig-4b]: Showing tumour cells arranged in sheets with nuclear pleomorphism, hyperchromasia, increased mitotic rate with desmoplastic stromal reaction (H&E,10X).



[Table/Fig-4c]: Showing individual tumour cells having distinct cell border with abundant eosinophilic cytoplasm, vesicular nucleus with prominent nucleoli (white asterisk) (H&E, 40X).

DISCUSSION

In India, the incidence rate of SCC was computed as over 30 per 100,000 populations affected in the age range between 50 and 60's [1]. Men are most commonly affected by oral cancer and 90% of cancers being SCC [2]. Age and origin of the tumour contribute to the risk of Distant Metastases (DM). The incidence rate of DM in patients with buccal mucosal SCC is around 3-52% [3] and young age being the risk factor for DM [4]. This case illustrates a rare disease entity as head and neck SCCs rarely metastasise to the pleura without any lung involvement.

Shao Y-Y and Hong RL had reported that in out of 52 with initial pleural metastases, 37% patients there was no concurrent lung involvement and that pleural involvement is an unique entity with its own clinical and pathophysiological features [5]. It is a poor prognostic marker for patients with lung metastases and lung metastases patients without pleural involvement had similar survival time compared to patients with other metastases denoting that metastatic pleural involvement is a grave prognostic indicator. Pleural metastases generally cause dyspnoea, chest pain, and weight loss. On Computed Tomography (CT), pleural metastases can present as pleural effusion, pleural nodules, or nodular pleural thickening with enhancement on contrast-enhanced CT [6]. However, in some cases, malignant pleural effusion may not demonstrate enhancement on CT. Accordingly, the presence of pleural effusion can be the only manifestation of metastatic disease to the pleura. Pleural metastases are often bilateral and invasion of the diaphragm or mediastinum is not frequently seen unlike empyema thoracis. On PET/CT, metastatic pleural disease shows increased FDG uptake that can be focal or diffuse, linear or nodular, and associated or not with anatomic abnormalities on axial imaging. The index patient showed FDG avid nodules in the subpleural region with massive pleural effusion. Pleural metastases need not always accompany with DM to other sites [7]. The stage of buccal mucosal SCC is an important determinant of DM [8]. It is recommended to confirm malignancies through pleural biopsies in SCC patients [6]. The survival rate was assessed to be short-term for pleural metastases over other metastases [8]. Though recollection of pleural effusion may occur, the treatment modality is preferably thoracentesis [9,10]. This patient did not develop re-accumulation of pleural effusion. In this present case, metastatic lesions were promptly identified using thoracoscopic pleural biopsy with frozen sections and was managed on table in the same sitting with successful doxycycline pleurodesis. Frozen section is a useful diagnostic procedure to identify pleural pathology [11] and have higher sensitivity and specificity than imprint cytology for intraoperative diagnosis of metastasis. This case report further emphasises the usefulness of frozen section in rapid on-table diagnosis of metastasis which aids in on-table pleurodesis and effectiveness in reducing the in-hospital morbidity of the patients.

Thoracocentesis in malignant pleural effusion has an unique challenge in the form of trapped lung which is an uncommon

complication of malignant pleural effusion [12]. It can develop due to pleural adhesions or involvement of visceral pleura with malignant lesions. It presents as post-thoracentesis hydropneumothorax (known as pneumothorax ex vacuo, (PEV) or pleural effusion that cannot be completely drained due to development of chest pain. It is important to recognise PEV, as although it may appear alarming, it is an asymptomatic process that is not amenable to chest tube placement. Fortunately, the index patient did not have trapped lung or re-accumulation of pleural fluid. Although uncommon, physicians should be aware of the metastatic potential of head and neck SCC.

CONCLUSION(S)

Patients with pleural metastases comprise a unique subgroup of head and neck SCC which has an abysmal prognosis. The possible course of treatment should be determined concerning patient's clinical condition along with tumour stage and malignancy type. In most of the patients with pleural metastases, the prognosis points to be dreadful. Hence, a comprehensive line of treatment with continuous follow-up and monitoring is warranted. This case report stresses that SCC rarely metastasise to the pleura without any concurrent lung involvement. Tumour origin and stage are vital features to contemplate with other clinical findings to rule out DM. Thoracoscopic pleural biopsy showed an advantageous effort in this patient. Frozen section also shortened the interval of inpatient admission and facilitated in early discharge of the patient thereby reducing the morbidity significantly.

REFERENCES

[1] Kim IH, Myoung H. Squamous cell carcinoma of the buccal mucosa involving the masticator space: A case report. J Korean Assoc Oral Maxillofac Surg. 2017;43(3):191-96.
[2] Van der Kamp MF, Muntinghe FOW, Lepsma RS, Plaat BEC, van der Laan BFAM, Algassab A, et al. Predictors for distant metastasis in head and neck cancer, with emphasis on age. Eur Arch Otorhinolaryngol. 2021;278(1):181-90.
[3] Montero PH, Patel SG. Cancer of the oral cavity. Surg Oncol Clin N Am. 2015;24(3):491-508.
[4] Takes RP, Rinaldo A, Silver CE, Haigentz M Jr, Woolgar JA, Triantafyllou A, et al. Distant metastases from head and neck squamous cell carcinoma. Part I. Basic aspects. Oral Oncol. 2012;48(9):775-79.
[5] Shao YY, Hong RL. Pleural metastases as a unique entity with dismal outcome of head and neck squamous cell carcinoma. Oral Oncology. 2010;46:694-97.
[6] Wang B, Cuellar SB, Ginsberg LE. Pleural metastasis in head and neck cancer: Imaging findings and clinical impact. J Comput Assist Tomogr. 2017;41:249-53.
[7] Asciak R, Rahman NM. Malignant pleural effusion: From diagnostics to therapeutics. Clin Chest Med. 2018;39(1):181-93.
[8] Bobdey S, Sathwara J, Jain A, Saoba S, Balasubramaniam G. Squamous cell carcinoma of buccal mucosa: An analysis of prognostic factors. South Asian J Cancer. 2018;7(1):49-54.
[9] Dorry M, Davidson K, Dash R, Jug R, Clarke JM, Nixon AB, et al. Pleural effusions associated with squamous cell lung carcinoma have a low diagnostic yield and a poor prognosis. Transl Lung Cancer Res. 2021;10(6):2500-08.
[10] Zamboni MM, da Silva CT Jr, Baretta R, Cunha ET, Cardoso GP. Important prognostic factors for survival in patients with malignant pleural effusion. BMC Pulm Med. 2015;28(15):29.
[11] Lim JU, Kim JS, Lee SH. Factors associated with discrepancy between fresh frozen and permanent biopsy from medical thoracoscopy: Single center analysis of 172 medical flexible thoracoscopy cases. J Thorac Dis. 2020;12(12):7164-73.
[12] Bandikatla S, Dadlani A. Trapped lung as a complication of pleural metastasis from squamous cell carcinoma of buccal mucosa. J Chest. 2021;160(4).

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