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Case Report

Hypopharyngeal carcinoma with skeletal muscle metastases: a rare clinical entity

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ABSTRACT

The common sites of distant metastatic spread of head and neck malignant tumor are lungs, liver, and bones. Skeletal muscles metastases are extremely rare. We present a case of 61-year-old man who was previously treated with radical chemo radiotherapy for hypopharyngeal squamous cell carcinoma, stage T4bN2cM0. During surveillance follow up 21 months post treatment, he developed a right proximal arm mass. There were no neurological or vascular deficit. MRI revealed an irregular enhancing intramuscular soft tissue mass within the right triceps muscle, with widespread nodal and skeletal muscle metastases. Tissue biopsy revealed a metastatic carcinoma favoring poorly differentiated squamous cell carcinoma. He received palliative chemotherapy but died 4 months later. Skeletal muscle metastases must be high in the list of differential diagnosis in a head and neck cancer patient presented with a muscle mass, even though it is rather rare. Radiological imaging and tissue biopsy helped in the diagnosis and prompt management.

Keywords: Hypophayrngeal carcinoma, Chemotherapy, Triceps muscle, Intramuscular

INTRODUCTION

Hypopharyngeal squamous cell carcinoma (SCC) accounts for 95% of all types of hypopharyngeal cancer and it carries discouraging prognosis despite contentious treatment.[1] It has been a challenge among otorhinolaryngologist head and neck surgeons and oncologists to preserve the organ and achieve best functional reconstruction methods post treatments.

CASE REPORT

A 61-year-old male with underlying hypertension presented with a one-month history of right neck pain that was radiated to the right ear. It was associated with progressive dysphagia and subsequently he had hoarseness however no shortness of breath. He was a regular alcohol drinker and a chronic smoker. Examination of the ear, nose, oral cavity and neck was unremarkable. Flexible nasopharyngolaryngoscopy showed a large fungating mass occupying the right pyriform fossa involving the lateral pharyngeal wall, extending superiorly to the inferior border of the right tonsil, medially involving the false cord of larynx and abutting the postcricoid region.

He had tracheostomy performed in view of the impending airway obstruction and biopsy of the hypopharyngeal

tumour was taken. Computer tomography of the neck and thorax showed a heterogeneous enhancing mass at the right hypopharynx, causing obliteration of the right pyriform fossa extending to the level of right palatine tonsil superiorly, glottic level inferiorly and laterally to the right submandibular region (Figure 1).

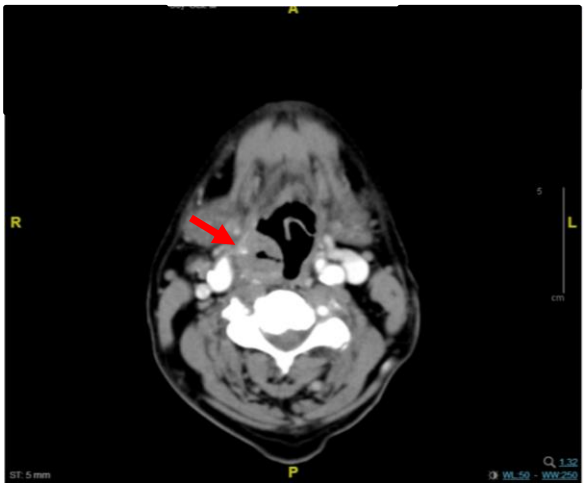

Figure 1: Axial CECT showed a heterogeneous enhancing mass (arrow) at the right hypopharynx, causing obliteration of the right pyriform sinus.

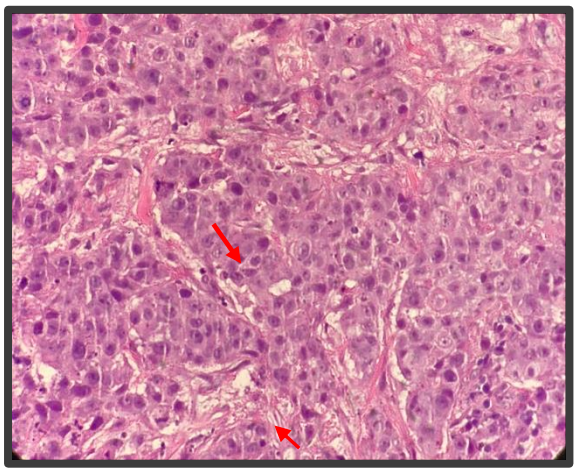

Figure 2: The malignant cells are markedly pleomorphic with hyperchromatic nuclei and prominent nucleoli (arrow). Occasional intercellular bridging and individual cell keratinization are seen. (200X).

Multiple subcentimeter lymph nodes were seen bilaterally. There was no distant metastasis seen. Histopathology examination of the biopsy specimen was reported as poorly differentiated squamous cell carcinoma (Figure 2).

He received radical chemoradiotherapy (70Gy/35#) for 7 weeks and IV cisplatin 40 mg/m^2 weekly. The tumour responded very well to the treatment given.He was under regular surveillance follow up until 21 months later, when he reported a painful right arm swelling. The mass appeared to be attaching to the triceps muscles, which was firm and tender on palpation (Figure 3).

Figure 3: Soft tissue mass at the under surface of the right arm (arrow) measuring 10x8 cm.

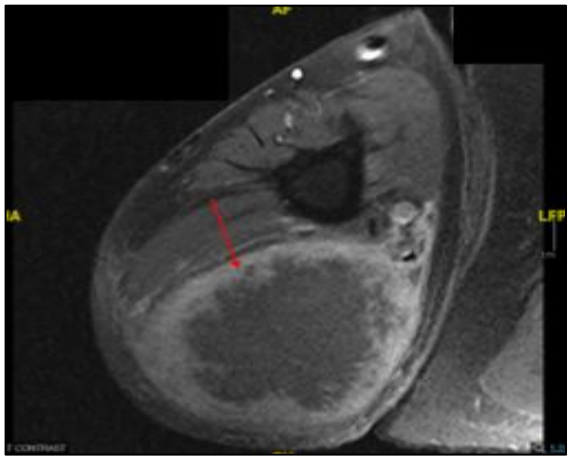

Figure 4: T1-weighted MR of right arm shows an intramuscular soft tissue mass within the right triceps muscles (arrow) measuring 5.4×6.2×10.9 cm.

There was no palpable cervical or axillary lymph node. Flexible nasopharyngolaryngoscopy showed no tumour recurrence at the hypopharynx. MRI of the right upper limb showed an irregular lobulated soft tissue mass within the right triceps muscle measuring 5.4×6.2×10.9 cm. The mass was hypointense on T1 weighted images and showed an intermediate signal on T2 weighted images. Irregular peripheral enhancement was seen post contrast (Figure 4).

Incisional biopsy from the right arm mass revealed a metastatic carcinoma (Figure 5A, 5B). The immunohistochemical studies showed positive CK7, CK5/6, CKAE1/AE3 and negative CK20. Epstein-Barr virus in situ hybridization was negative (Figure 5C, 5D, 5E, 5F). These features were consistent with poorly differentiated squamous cell carcinoma.

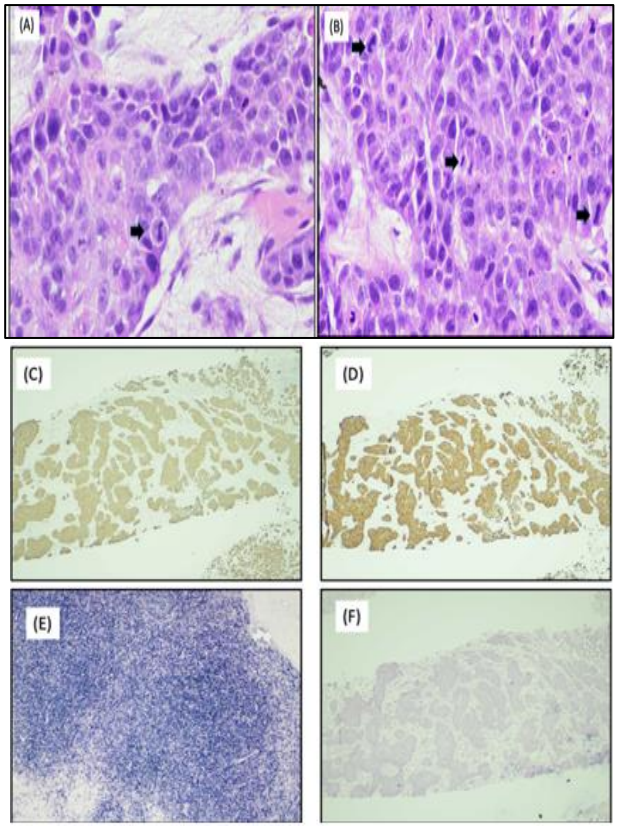

Figure 5: The malignant Cells exhibiting hyperchromatic and pleomorphic polygonal cells with prominent nucleoli. (A and B) Mitotic figures are brisk (black arrow) 400X. (C) The malignant cells are positive with CKAE1 / AE3, 40X and (D) CK5/6 postive for squamous cell, 40X (E) Positive control for EBER ISH, 40X. (F) The malignant cells are negative for Eber ISH, 40X.

Repeated FNPLS show no evidence of tumour recurrence. He had a MRI of the neck and thorax subsequently, which showed widespread metastases including right supraglottic with involvement of anterior commissure and right vocal cord, a metastatic lesion over the base of right hemitongue. Multiple nodal metastasis (bilateral cervical, right axillary, right mesenteric and left retrocrural) were seen. Multiple disseminated intramuscular metastatic deposits (right teres minor, right triceps, right rectus femoris, bilateral supraspinatus, left rectus abdominis muscles) were also seen. In view of the extensive metastases, palliative chemotherapy was initiated. However, the patient succumbed to the disease 4 month later.

DISCUSSION

Hypopharyngeal cancer accounts for 7% of all aerodigestive tract cancer and it commonly arises from the epithelial layer.[2] There are few types such as basaloid squamoid, spindle cell carcinoma, small cell carcinomas, undifferentiated carcinoma and carcinoma of the minor salivary glands. The most predominant is squamous cell carcinoma (SCC).[2] Hypopharynx located at the inferior portion of the pharynx and divided into 3 subdivisions which are pyriform sinus, the posterior pharyngeal wall and post cricoid. Above all the divisions, the commonest side for cancer is pyriform sinus around 85% followed by posterior pharyngeal wall 20% and post cricoid 15%.[3]

The exact aetiology of hypopharynx cancer is yet to be determined, but there are several risk factors. It may be divided according to anatomical sites in which upper hypopharynx seem to be related to alcohol and smoking consumption whereas lower part of hypopharynx is linked to nutritional deficiencies.[2,4] Blot et al stipulated in his study, the risk of oral and pharyngeal cancer increased in multiplicative manner to those who smoked and consumed alcohol simultaneously.[5] Besides that, iron and vitamin C deficiency also may predispose patient to develop post cricoid carcinoma as reported from northern Europe journal.[6-9] Other risk factor such as oncogenic viruses, defect in DNA repair mechanism as well as gastroesophageal reflux also contribute to development of this disease.[6-9] In our case, the patient is a smoker and an alcoholic thus the risk for this patient to develop hypopharyngeal carcinoma is higher compared to non-smoker and non-alcoholic individual.

Occurrence of distant metastasis in hypopharyngeal cancer is stipulated based on initial tumour localization staging, regional lymph node metastasis and tumour location.[2] Study deduced that the incident of distant metastasis occurred 3 times greater in hypopharyngeal cancer compare to laryngeal cancer due to advance initial tumour presentation. Furthermore advanced regional lymph node metastases also increased incidence of distant metastasis.[2]

Skeletal muscles represent 43% of human total body weight but metastasis to these structures are relatively uncommon.[10] Less than 5% of all systemic metastasis involves skeletal muscles, with adenocarcinoma being the commonest histology subtype.[10] Zarah et al suggested that the low incidence of skeletal muscle metastases are due to repetition of muscle contraction that causes biochemical death of the tumour cells.[10] Besides, the production of lactic acid and protease inhibitors within the muscle also hinders the growth of tumour cells by blocking enzyme-dependent tumour implantation or atherogenesis or both.[10]

In our case, preliminary diagnosis for this patient was primary soft tissue tumours due to no clinical evidence of recurrence lesion over the hypopharynx region. Meta-analysis study done by Haygood et al reported 26.5% of cases (70 of 264 cases) of skeletal muscles metastases present before the existence of a primary tumour.[11] Besides that, similar observation was described by Pretell–Mazzini in up to 53.7% of cases (124 of 231cases).[12] Furthermore, it has also been reported of synchronous metastasis in 4% to 13% of cases. Based on

this clinical evidence, a differential of skeletal muscles metastasis is included in our patient.[12]

Screening for distant metastases in head and neck cancers is debatable. The most frequently used imaging is computed tomography (CT) as it is highly accessible, low cost and short procedure time. Even so, distant metastasis and tumour extension into surrounding structure are difficult to assess as it has low soft tissue contrast. Studies have shown CT as standalone examination is inferior to magnetic resonance imaging to evaluate parenchymal and osseous structures.[13] MRI and positron emission tomography computed tomography (PET-CT) has shown promising multimodality approach for systemic tumour detection and cancer staging. Recent manuscript contrast these 2 modalities and concluded for tumour localization and lymph node assessment PET-CT is more beneficial with diagnostic accuracy of 93% in PET-CT and 79% in MRI whereas MRI is helpful in diagnosing soft tissue metastasis with overall diagnostic accuracy of 92% compared to 82% in PET-CT.[14] Our patient received initial MRI of right upper limb which show intramuscular soft tissue mass within the right triceps muscles on T2-weighted MR thus proceeded with neck and thorax MRI after HPE result show metastasis carcinoma from the incision biopsy taken from the right arm.

The treatment options for distant soft tissue metastases are highly individualized as there is little published data. The largest study published regarding distant soft tissue metastases by Damron and Heiner included 30 new patients and a review of 91 case reports in which 2 cases were hypopharyngeal carcinoma.[15] Study concluded choices of chemotherapy, radiotherapy or a combination of both will be much depend on the primary tumour, the extent of the tumour and overall health of the patient.[15] For our patient, palliative chemotherapy is the best option as he is having extensive recurrent tumour metastasis 18 month post radical radio chemotherapy.

Hypopharyngeal carcinoma is one of the worst prognosis than other head and neck cancers with 5 years disease free survival rate ranging from 18% to 65%. In addition, with clinical presentation of neck metastasis 5 years disease free survival reduces by 26%.[16] Late presentation, multisite involvement within hypopharynx, lymphatic pathway and restricted surgical option for complete resection is the key factor contributing to poor prognosis for the patient.[16]

CONCLUSION

Skeletal muscle metastasis following head and neck malignancy is very rare. This case report would raise the awareness and vigilance in treating patients with advanced head and neck carcinoma. We recommend to include a complete full body physical examination as an adjunct during surveillance follow up for head and neck cancers.

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