



Synchronous Bony and Head and Neck Malignancies – A Rare Presentation

Vijendra S Shenoy Raghavendra A Rao Vishnu Prasad, Neethu M Mathew

Manipal University

ABSTRACT

The incidence of distant metastases in head and neck squamous cell carcinoma (HNSCC) is relatively small in comparison to other malignancies and the rate of development of a bony second primary in a patient with HNSCC even smaller. Presence of a second primary adversely impacts the survival and may significantly alter treatment planning. Pulmonary secondaries and second primaries are the most frequent in SCC. A bony second primary in HNSCC is rare and not reported. In this article, we report the case of a patient with oral cavity malignancy that developed osseous second synchronous primary to the distal end of the femur. The diagnosis was made based on x-ray findings, bone scan findings and bone biopsy.

We report this case because we believe that a second primary of osteoclastoma at the distal femur along with an oropharyngeal carcinoma has never been reported and to emphasize on the

importance of awareness of the possibility of the development of osseous second primaries mimicking osseous metastasis in head and neck cancer, although it is not a common phenomenon.

KEY WORDS

Oral cavity malignancy, femur, second primary, osteoclastoma

INTRODUCTION

Oral carcinoma accounts for about 3 to 4 % of all cancers in India, the majority of which are carcinomas, with a minor proportion being sarcomas. The most common type of carcinoma is squamous cell carcinoma. It occurs more often in men, with a male:female ratio of 3-4:1, and most commonly in the 7th or 8th decade of life.¹ The higher rate of oropharyngeal malignancy in India is most likely related to the widespread habit of chewing tobacco.

When compared to other malignancies, the incidence of distant metastasis in head and neck squamous cell carcinoma is relatively small.^[2] Distant metastasis adversely impacts the survival of the patient and may significantly alter the treatment planning. Carcinoma of head and neck is an uncommon primary source of bone metastasis. However due to the development in treatment modalities and the subsequent improvement in the duration of survival in these patients, the probability of bone involvement in head and neck malignancies has also increased.

In contrast the incidence of a bony second primary in adjunct to a head and neck malignancy is even smaller.³ An osseous second primary often mimics a bony metastatic lesion. Radiological differentiation between the two lesions is a challenge, often requiring a histopathological evaluation for diagnosis.

CASE REPORT

A fifty - five year old male patient, a known smoker since more than 35 years, with no other co-morbidities, presented with chief complaints of swelling over the right side of the face and neck, and difficulty in swallowing since 1 month. (Figure 1) The patient noticed a swelling developing over the right side of the face since one month which was initially small in size and gradually increasing in size. He then developed difficulty in swallowing with a foreign body sensation on swallowing which also had been gradually worsening since one month. The patient also gave history of muffling of voice. There was history of swelling and severe pain over the left knee since two weeks with difficulty in walking. Other positive history included history of right ear pain, loss of appetite and loss of weight since approximately one month.

On examination, the general condition of the patient was fair and vitals were stable. Systemic examination was within normal limits. Neck examination revealed a 5x3 cms hard, fixed lymph node at level II on the right side, and a 2x1 cms, hard fixed lymph node at level Ib on the right side. The laryngeal framework and crepitus was normal.

On oral cavity and oropharyngeal examination, an ulceroproliferative growth was seen to be arising from the right tonsillar fossa. Anteriorly the growth was involving the anterior pillar reaching up to the retromolar trigone. Superiorly it was extending up to 0.5 cms from the margin of the soft palate. Medially the growth was just abutting the uvula. Uvula was free and not involved. Posteriorly the growth was extending to the lateral pharyngeal wall and was not involving the posterior pharyngeal wall. Inferiorly the growth involved the tonsillolingual sulcus. (Figure 2) On palpation, the base of tongue on the right side was indurated. Rest of the oral cavity and oropharynx was within normal limits.

Indirect laryngoscopy and 70° endoscopy revealed an ulceroproliferative growth arising from the right tonsillar fossa involving the right lateral pharyngeal wall, and extending downwards to involve the right base of tongue and vallecula. The growth was overhanging onto the epiglottis. Bilateral vocal cords were moving equally with respiration and phonation. Rest of the larynx was within normal limits. The posterior pharyngeal wall, pyriform fossae and post cricoid region was free and within normal limits.

On examination of the knee a hard, non mobile swelling of 10x8 cms was palpable over the medial aspect of the left knee. There was no crepitus palpable and no evidence of effusion within the knee joint. Flexion at the left knee joint was also restricted. (Figure 3)

Examination of the Nose and Ear was within normal limits. FNAC of the neck swelling over the neck was reported as metastatic squamous cell carcinoma. Histopathology report of a biopsy taken from the oropharyngeal lesion was described as moderately differentiated squamous cell carcinoma.

A panendoscopy was done under GA to evaluate the extent of the visible growth and to check for other primaries within the lower respiratory and gastrointestinal tracts. Blind biopsies were taken which were histologically noted to be non-significant.

An orthopaedics reference was sought in view of the knee joint pain and swelling. X ray of the knee joint antero-posterior and lateral views were taken, which revealed a well-defined osteolytic lesion on the medial aspect of the lower end of the left femur suggestive of metastasis. (Figure 4)

A bone scan was carried out using IV injection of 20mCi of ^{99m}Tc-MDP, in both anterior and posterior projections. The scan showed irregularly increased uptake over the lower end of the left

femur, again suggestive of osseous metastasis. Rest of the bones were grossly normal and the kidneys were normally seen. (Figure 5)

In order to confirm the metastasis and thereby to plan for further treatment a biopsy was taken from the bony swelling which revealed the following histopathological image. (Figure 6) It was quite peculiar to be a squamous cell carcinoma. The diagnosis was then revealed to be osteoclastoma. Hence proving to be a second synchronous primary in the patient.

The patient underwent excision of the lesion followed by knee arthrodesis by way of full length nailing from the femur to the tibia under general anaesthesia. The patient is planned for concurrent chemoradiotherapy for the treatment of his double primary.

DISCUSSION

The induction of new cancers in the head and neck region is attributable to repeated carcinogenic insults (For example from tobacco and alcohol use). The exposure increases the likelihood that multiple independent malignant foci will develop in the epithelium. The frequency of development of a second tumour following a primary head and neck malignancy varies from 16 to 36 %. It has been observed that the risk of development of a second primary in these patients is 10 to 30 times higher than in the standard population. ^[4]

Head and neck squamous cell carcinomas (HNSCCs) are tumours with a propensity for spread, mostly locoregionally, the most common route of spread being through lymphatics. Distant metastasis via the hematogenous spread have been reported to the following regions: lungs, bone, liver, mediastinum, adrenals, kidney, heart and brain. ^[5]

The first report of a distant metastatic rate of 1% was by Crile (1906). ^[6] Other studies done subsequently have shown this incidence to be much higher. A study by Merino (1977) done on 5019 patients recognized an 11% incidence of distant metastasis. Although autopsy studies have revealed higher incidences of bone metastasis, clinical studies have reported an overall incidence of 25% with bone metastasis being the second most common site after the lungs. Frequency of bone metastasis ranges from 17% to 31% of the sites that can be involved by head and neck malignancies. ^[7]

Betka (2001) described the incidence of distant metastasis as varying from 2 to 17%, with metastasis from oral cavity tumours being at the lower end of this scale. Bone metastasis was reported to be 22% in clinical studies and 15% through autopsy studies, with the most frequently involved bones being the axial skeleton, namely skull, spine, ribs and pelvis, and in the appendicular skeleton, the femur. The most common site of involvement of the femur is also

reported to be the proximal end. The patient in our case study however had a metastatic lesion on the lower end of the femur. The study by Betka done suggested correlations between disease grade, primary tumour size and nodal status with the incidence of distant metastasis; and the higher end of each was noted to be associated with an elevated likelihood of distant metastasis. ^[5] This was the reason why we had a high index of suspicion of metastasis in our patient with a large primary tumour of T3 staging, and high nodal stage of N2b.

The results of several studies have shown the axial skeleton to be the most common site of bone metastasis involving the spine, pelvis, and ribs frequently. The single most frequent site of bone metastasis is the lumbar spine. ^{[8],[9]} In the appendicular skeleton, the proximal femur is the most common site and humeral lesion also occurs frequently.

A case report by Pichi et al (2009) on a rare talus metastasis pointed out the importance of paying attention to external symptoms outside the primary lesion. Patients with bone metastasis commonly present with symptoms of severe aches, especially at night, and subsiding when the patient moves. Patients may also present with pathological fractures. Investigations may or may not reveal raised ALP, however X ray features can suggest (with 50% sensitivity) the possibility of metastasis. ^[10] The patient in our case study had presented with complaints of severe pain and swelling over the medial aspect of his left knee, which he attributed to a fall. On routine blood investigations although ALP was not noted to be raised, X ray of the joint revealed the osteolytic metastatic lesion at the lower end of the femur. Commonly done investigations, besides x ray and serum ALP levels, to confirm the presence of metastasis are, Radionuclide scanning which has an 80- 95% sensitivity and CT, MRI which has an 89% sensitivity and 54% specificity. ^[5]

Basu et al (2007) suggested the use of FDG PET scan for early detection of occult bone metastasis, as his study revealed skeletal involvement within one year of initial diagnosis of oral

cavity malignancy, hence changing treatment goals from curative to palliative. ^[11] Strobel et al (2009) in a study of FDG PET discovered that out of the 589 patients with head and neck cancers studied, 9.5% of them had synchronous cancers, with the test having a sensitivity of 87% and specificity of 77%. However what is interesting to note is that there was no incidence of a bony second primary. The common regions of synchronous primaries along with a head and neck malignancy were in the lungs (46.4%), ear, nose or throat (26.7%), esophagus (8.9%), colon (8.9%), stomach (1.8%). Bony uptakes seen on the FDG PET scan usually tended to be metastatic lesions. His study yielded a 22% rate of distant metastasis to bone from the head and neck region. ^[3]

Ho et al, in his report of a patient with buccal mucosal malignancy with polyostic fibrous dysplasia mimicking extensive bone metastases, revealed that benign bone lesions might not be easily differentiated from bony metastasis using even FDG PET. ^[12] Hence this necessitates the need for histopathological diagnosis of any bony lesion seen in a patient with head and neck malignancy and a high index of suspicion of a second primary must be borne in mind, even though the presence of a distant metastasis may be more likely.

CONCLUSION

Our case study reports a case of a patient with buccal mucosal malignancy (T3 N2b) with an uncommon synchronous primary lesion of osteoclastoma at the lower end of the femur. In conclusion, it is vital to identify the presence of a distant metastasis and have a suspicion of a possible bony second primary, for the planning of further treatment. Screening imaging modalities may not be sufficient for the diagnosis. Adequate histopathological confirmation is always advisable for treatment planning.

REFERENCES

[1] American Cancer Society. Global Cancer Facts & Figures 2nd Edition. Atlanta: American Cancer Society; 2011.

(<http://www.cancer.org/acs/groups/content/@epidemiologysurveillance/documents/document/acs-pc-027766.pdf>)

[2] Virendra Bhandari, Ravi Jain. A retrospective study of incidence of bone metastasis in head and neck cancer. *Journal of Cancer Research and Therapeutics*. 9.1 (January-March 2013): p90.

[3] Strobel et al. Head and neck squamous cell carcinoma (HNSCC) – detection of synchronous primaries with 18F-FDG-PET/CT. *European Journal of Nuclear Medicine and Molecular Imaging* (June 2009). 36 (6): 919-927.

[4] Slaughter DP, Southwick HW, Smejkal W. Field cancerisation in oral stratified squamous epithelium. *Cancer* 1953. 6: 963-8.

[5] Betka. Distant metastases from lip and oral cavity cancer. *Journal For Oto-Rhino-Laryngology And Its Related Specialties*, July 2001. 63 (4): 217.

[6] Crile GW. Excision of cancer of the head and neck. *JAMA* 1906. 47: 1780-1786.

[7] Merino OR, Lindberg RD, Fletcher GH. An analysis of distant metastasis from squamous cell carcinoma of upper respiratory and digestive tracts. *Cancer* 1977. 40: 145-151.

[8] Halperin EC. Over priced technology in radiation oncology. *Int J Radiat Oncol Biol Phys* 2000. 48:917-8.

[9] Siegel JE, Weinstein MC, Russell LB. Recommendations for reporting cost-effectiveness analyses. Panel on Cost-Effectiveness in Health and Medicine. *JAMA* 1996. 276:1339-41.

[10] Pichi B, Marchesi P, Manciooco V, Ruscito P, Pellini R, Cristalli G, Terenzi V, Spriano G. Carcinoma of the buccal mucosa metastasizing to the talus. *J Craniofac Surg*. July 2009 20(4):1142-5.

[11] Basu D, Siegel BA, McDonald DJ, Nussenbaum B. Detection of occult bone metastases from head and neck squamous cell carcinoma: impact of positron emission tomography computed tomography with fluorodeoxyglucose F 18. *Arch Otolaryngol Head Neck Surg*. August 2007. 133(8):801-5.

[12] Kung-Chu Ho, Tzu-Chen Yen, Shu-Hang Ng³ Kun-Ju Lin. Mimicking Extensive Bone Metastases in FDG PET Scan in An Oral Cancer Patient with Polyostotic Fibrous Dysplasia. *Ann Nucl Med Sci* December 2006.19(4): 247-251.

LEGENDS



Figure 1: *Patient with swelling seen over the right side of the face and neck*



Figure 2: *Ulceroproliferative growth within the oral cavity*



Figure 3: *Hard swelling noted over the medial aspect of the left knee causing restriction of flexion.*



Figure 4: *X- ray of the knee joint AP view showing a lytic lesion over the medial end of the femur*

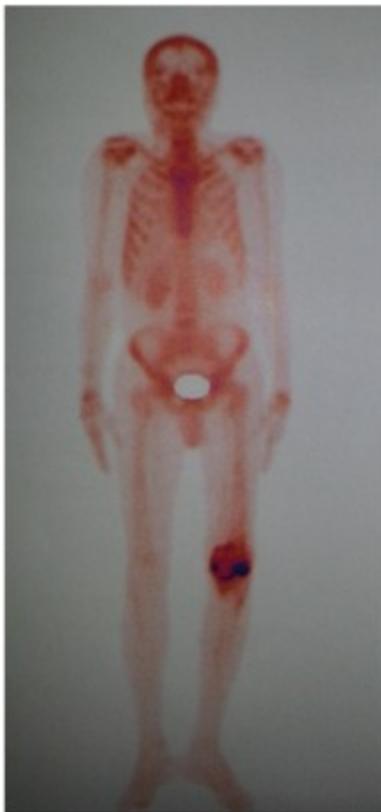


Figure 5: *Anterior projection of bone scan*

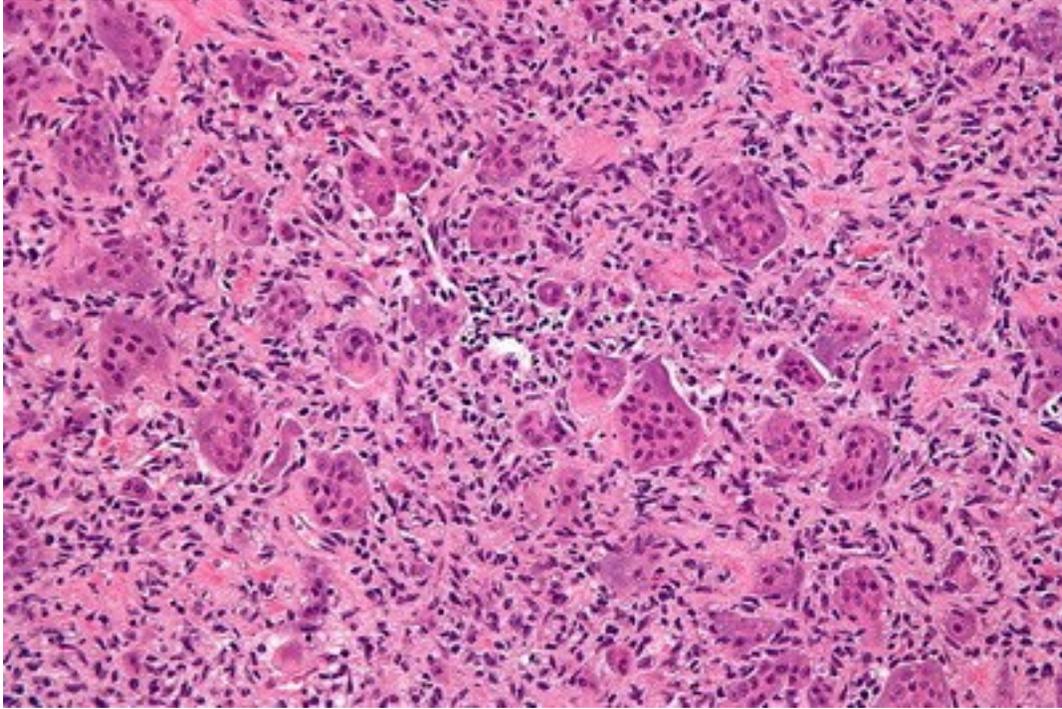


Figure 6: *Histopathological image of bone biopsy*