

## Unusual metastasis of squamous cell carcinoma to musculoskeletal system; Series of cases with literature review

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### Abstract

Metastasis to musculoskeletal system may develop after initial diagnosis of primary malignancy or in some cases before primary cancer is detected. In later case it may be presenting symptom and metastasis from primary internal malignancy should be kept in differential diagnosis irrespective of imaging findings. We present series of cases of unusual metastasis of squamous cell carcinoma to musculoskeletal system in known or unknown primary. Soft tissue metastasis is a sign of advanced disease and is poor prognostic factor. Common cancer spreading via hematogenous routes to musculoskeletal system is of Lungs, kidney, Breast etc. We hereby present series of cases of squamous cell carcinoma deposits to muscle, soft tissue or bones.

**Keywords:** Squamous cell carcinoma, Soft tissues, Bones, Metastasis.

### Introduction

Distant metastasis to soft tissue is defined as metastasis to skeletal muscle and subcutaneous tissue, are rarely reported in literature.<sup>1</sup> Soft tissue or bone metastasis occurs via hematogenous route, lungs followed by kidney are most common and known primary sites although breast and thyroid producing lytic bone destructions lesions in females is increasing in incidence; in males osteoblastic secondaries from prostatic primary are not uncommon, apart from these non squamous malignancies; squamous cell carcinoma involving bone, muscle and soft tissues is noted in literature, this is particularly with increasing incidence of head neck squamous malignancies and younger age of presentation or good survival due to treatment advances. Carcinoma of the head and neck is an uncommon primary source of bone metastases. The increasing duration of survival of these patients due to newer treatment modalities however, increases the probability of late bone involvement. The objective was to identify the frequency, clinical presentation, and clinical course of metastatic disease to bone from head and neck and other squamous malignancies. Despite the increasing overall survival of patients with these carcinomas, distant bone metastases are infrequent, but should be considered a possibility in any patient with a concurrent or past diagnosis of head and neck carcinoma.<sup>2</sup> The distant metastasis plays a critical role in the management and prognosis of oral cancer patients. Generally, metastatic disease of the appendicular skeleton results in significant morbidity. It requires operative treatment in order to facilitate weight bearing and

minimize pain in contrast to metastases in the axial skeleton, which can often be treated with radiotherapy. With the development of newer radiotherapy techniques and availability of better chemotherapy drugs used concurrently has led to better control in carcinoma treatment. However, this better control in the local disease has led to increased incidence of distant metastasis.

### Materials and Methods

Present study was carried out in department of Pathology at tertiary care cancer hospital. Present study included all the cases diagnosed as metastasis of squamous cell carcinoma to bone, soft tissue i.e. musculoskeletal system. Patient presenting as unusual metastasis without known primary were included in study. All radiological details, presenting sign, symptoms, previous histopath reports and treatment history were recorded. Careful scrutiny, contextual interpretation and deep cut sections were studied in all cases where coexisting other malignancy or other pathology was suspected. Sections were processed as a routine processing protocol and studied with H and E stains. Ancillary studies like immunohistochemistry was not carried out as diagnosis offered was unequivocal. Total 9 cases were studied, source of primary and site of distant metastasis varied in each case. Non squamous malignancies like adenocarcinoma etc. with unusual metastasis were excluded from study. Primary squamous cell carcinoma involving musculoskeletal system was excluded from study.

**Observation and Results**

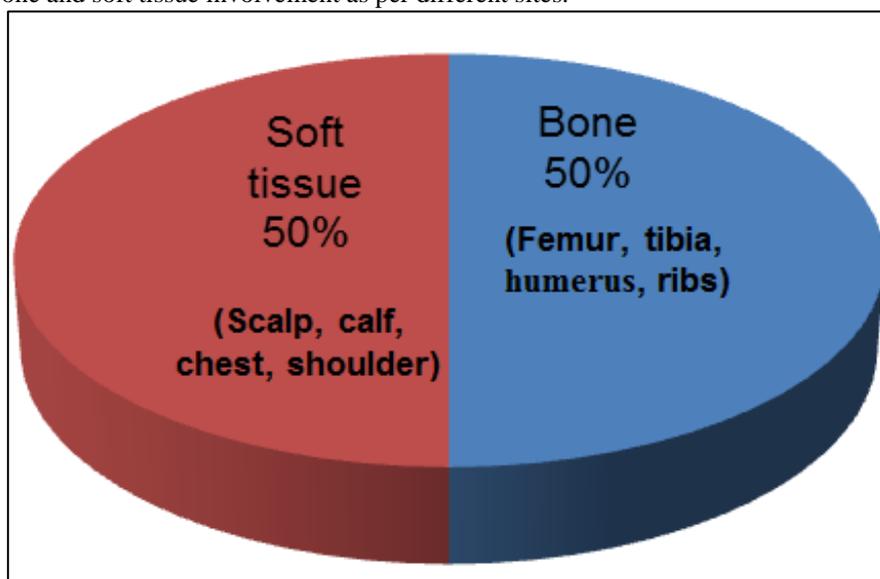
**Table 1:** Summary of patients with metastatic squamous malignancy.

S. No.	Age	Sex	Site of lesion	Clinical History	Other Findings	Histopath Report
1	60	M	Right Femur Biopsy	K/C/O CA LUNG	Right Hip Pain, Inability To Walk	Metastatic Squamous Cell Carcinoma
2	70	M	Right Shoulder Biopsy	K/C/O CA LUNG	Fnac S/O Adnexal Tumour.	Metastatic Squamous Cell Carcinoma
3	40	M	Right 6th, 7th, 8th RIB Resection + Cervical Ln	K/C/O CA Oesophagus	CT Scan:Most Likely Represents Metastatic Etiology	Metastatic Squamous Cell Carcinoma
4	55	F	Scalp wedge biopsy	K/c/o ca cervix	Post rtct	Metastatic squamous cell carcinoma
5	30	M	Right Calf Mass Biopsy	K/C/O CA Supraglottis	MRI:S/O Neurofibroma, Tumour Involving Soleus Muscle.	Metastatic Squamous Cell Carcinoma
6	38	F	Biopsy From Left Tibia	K/C/O CA Tongue Post RTCT	MRI:S/O GCT Of Proximal Tibia	Metastatic Squamous Cell Carcinoma
7	35	M	Edge Biopsy Right Chest Growth	K/C/O CA Buccal Mucosa	Carcinoma with sarcomatoid features.	Metastatic Squamous Cell Carcinoma
8	35	M	Biopsy From Lower End Humerus	K/C/O CA Penis	Bone scan right humerus fracture ? OGS? Metastasis.	Metastatic Squamous Cell Carcinoma
9	62	F	Biopsy From Left Shoulder Lesion	Unknown Primary		Metastatic Squamous cell Carcinoma

**Table 2:** Comparison with other studies

Case reports	Primary tumour	Site of osseous involvement
Latha P.Rao et al <sup>7</sup> (n=1)	Buccal mucosa	Vertebrae
Vahtsevanos K et al <sup>8</sup> (n=4)	Lip	Scapula, vertebrae, clavicle & ribs
Shrivastava R et al <sup>9</sup> (n=1)	Alveolar SCC	Phalanges
Pichi B et al <sup>10</sup> (n=2)	Tongue & floor of mouth	Talus
Narendra Kumar et al <sup>11</sup> (n=1)	Larynx	Distal phalanges
Present study (n=4)	Lung, tongue, penis, oesophagus	Femur, tibia, humerus, ribs respectively

**Graph 1:** Showing bone and soft tissue involvement as per different sites.



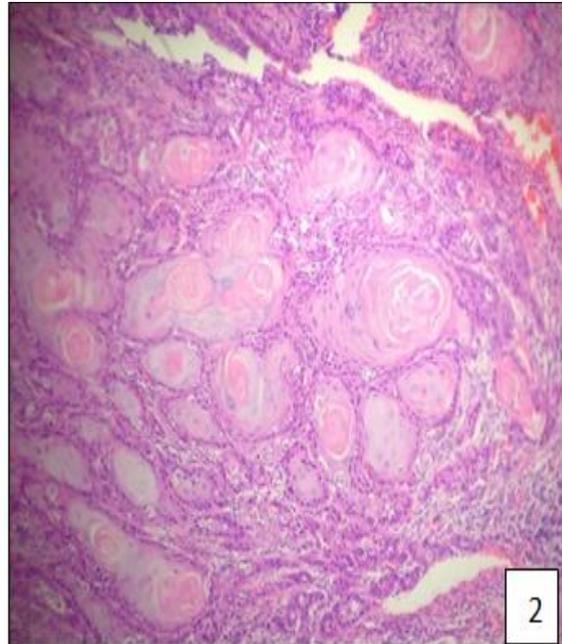
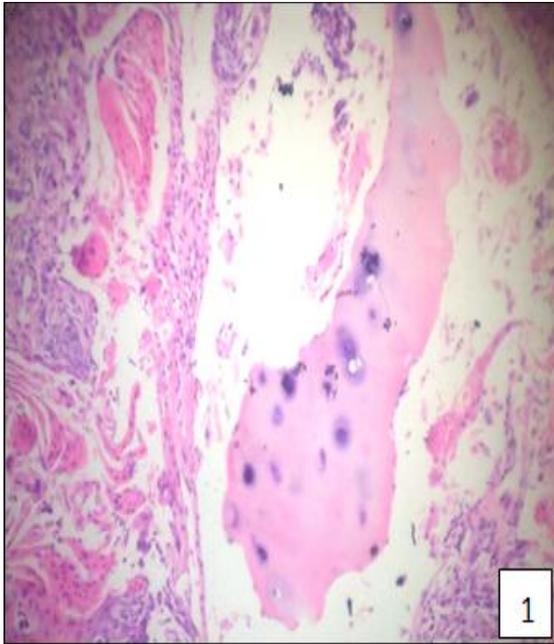


Fig 1,2: Showing conventional squamous cell carcinoma with bony involvement.



Fig. 3: Clinical photograph of patient with ca cervix with scalp metastasis –case no 4



Fig. 4: Clinical photograph of patient with ca supraglottis with calf metastasis-case no.5



Fig. 5: Radiological findings of case of carcinoma penis with involvement of humerus.-case no.8

Of all nine patients youngest patient was of age 30 years and oldest patient was of 70 years old.

Of the total nine cases in one case primary could not be evaluated, this case was of biopsy from shoulder lesion showing features of conventional squamous carcinoma.-- case no:9

One case-case no.7 showed features of sarcomatoid squamous carcinoma and IHC studies confirmed the diagnosis of sarcomatoid squamous cell carcinoma of buccal mucosa, later patient presented with chest wall soft tissue swelling as soft tissue metastasis which also revealed sarcomatoid features also. In three cases patient had received chemoradiation and later presenting with distant metastasis. Radiological evaluation including PET SCAN, MRI/CT SCAN was carried out however final diagnosis was deferred till histopath report.

FNAC was carried out in one case: -- case no: 2 however conclusive diagnosis was offered on histopathology.

## Discussion

Incidence of distant metastasis of squamous cell carcinoma commonly involves lungs, liver and uncommonly bones and soft tissues. Patient usually presents with cutaneous nodules associated with pain, although these lesions may represent as inflammatory process clinically, diagnosis should be confirmed by cytology/histopathology study. Radiological findings may be contributory in few cases however biopsy remains essential for conclusive diagnosis.

In our series of case one case of tibia lesion biopsy was suspected as giant cell tumour of bone and calf swelling of other case was suspected as neurofibroma on MRI however both cases were diagnosed as metastatic squamous cell carcinoma. Also case of fracture humerus was clinically suspected as osteogenic sarcoma which turned out to be metastatic squamous carcinoma. Hence although radiological findings are important as part metastatic work up; final diagnosis is confirmed on histopathology examination.

Metastasis may occur as distant spread, spread in contiguity or hematogenous spread. Commonly involved soft tissue sites include shoulder, forearm, scapula or calf muscles. Amongst bones bone metastasis involving spine, pelvis, and ribs, with lumbar spine being the most common.<sup>3</sup> in the appendicular skeleton, the proximal femur and humerus are mainly involved.

The most common clinical setting in which distant soft tissue metastases have been observed is as part of a previously diagnosed malignancy, but based on review of the literature, many metastatic tumors to soft tissue do present as occult metastases from an unrecognized primary, in particular lung. However apart from lungs and kidneys other uncommon but known primaries like penis, cervix and esophagus should be kept in differential. Clinically patient may present with soft tissue swelling or pain and radiologically it may suspected as bone or soft tissue tumour however biopsy is essential and Immunohistochemistry study and radiological findings should be done to locate primary, also possibility of metachronous other malignancy should be considered in known cases of carcinoma, although rare it is known to occur. Soft tissue sarcoma or bone tumour may resemble clinically radiologically with metastatic malignancies however establishing diagnosis is

essential since management and prognosis of sarcomas or metastatic carcinomas is entirely different.<sup>4</sup>

In case reported by TAKAGI H,<sup>5</sup> et al. 48 year female case of carcinoma cervix presented with scalp lesion and this finding was in concordant with our case of Ca cervix with scalp metastasis.

In case reported by C C K Ho, MD,<sup>6</sup> patient of Ca penis presented with hypercalcemia with pathological fracture humerus, these findings were similar to our case, biopsy proved the findings of metastatic squamous cell carcinoma to humerus.

## Conclusion

We point out that distant metastases of SCC's of the head and neck and other region can manifest themselves in the peripheral skeletal muscles and adjacent soft tissues. Therefore, during performing a tumor staging and during aftercare, all the patients presenting with symptoms of boney or soft tissue involvement should undergo biopsy apart from routine radiological investigations. Also in the cases where occult metastasis without known primary occurred evaluation should include squamous malignancies primary like penis, cervix, head neck, esophagus apart from known common primaries like kidney and lungs. In loco-regionally advanced cases of all carcinoma cases a bone scan should be done prior; this will help to reduce morbidity; to improve survival due to better therapeutic options.

More frequent reports and better understanding on these rare events may give new insight to clear strategies to prevent musculoskeletal metastases.

**Conflict of Interest:** None.

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