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## Case Report

# Bronchogenic carcinoma metastasis to first metacarpal bone: A rare case report ☆☆☆

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## ABSTRACT

Metastasis accounts for the majority of malignant bone tumors in adults. The commonly involved bones are pelvis, spine and proximal long bone. Metastasis below elbow and knee joint is rare. Metastasis to the hand is very rare, when they occur the commonest sites are distal phalanges. Lung cancer is the commonest primary to metastasize to the hand. Here we present a 51-year-old male known lung cancer (adenocarcinoma of the lung) patient for whom lobectomy was done and put on adjuvant chemotherapy latter presented with long standing left thumb pain and swelling, initially treated with antipain with a diagnostic impression of tenosynovitis. Ultrasound guided core needle biopsy was taken and metastatic adenocarcinoma infiltration confirmed. Hand metastasis is usually mistaken for inflammatory or infectious conditions, so what we wanted to highlight in this case report is although hand metastasis is very rare it should be considered in patients with long standing pain and swelling especially if there is any primary tumor even if its remote. In few cases it can also be an initial presentation.

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## Introduction

In adult population metastasis accounts for the most common bone cancer. The common sites of bone metastasis are spine, pelvis, ribs, skull and proximal long bones [1]. Bones are the

third common site of metastasis following lung and liver. But metastasis to upper extremity is uncommon [1,2]. The most common primary tumor to metastasize to bone are breast followed by lung and prostate cancer [3]. Acrometastasis defined as metastasis below knee and elbow joint is very rare with estimated incidence of 0.1%–0.2% [4]. It was first described in

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1906 by Handley in a breast cancer patient presented with metacarpal pathological fracture [4,5]. Metastasis to the hand are very rare accounting for 0.15% of hand tumors [1,3]. The most common primary cancer to metastasize to the hand is lung cancer accounting for 40% of cases, other primary tumors include breast, genitourinary and gastrointestinal origins [1,5]. Diagnosis and treatment are usually delayed due to its rare occurrence and the symptoms could also be attributed to other more common benign pathologies as it can mimic inflammatory conditions like gout, rheumatoid arthritis and infections like septic arthritis and osteomyelitis [3,5]. In the hand the commonest site of metastasis are distal phalanges followed by metacarpal bones and proximal phalanges [1]. Presence of hand metastasis signifies advanced disease and poor prognosis.

### Case presentation

A 51-year-old male patient diagnosed with lung cancer a year back after presenting with cough and hemoptysis of 1 month duration. On chest CT (Fig. 1) showed left lower lobe ill-defined enhancing soft tissue mass and bronchoscopic biopsy showed bronchogenic ca. Left lung lower lobe lobectomy was done and post op biopsy showed well differentiated adenocarcinoma. He was given adjuvant chemotherapy. During follow up on his 10th post op month he presented with left thumb pain and swelling. He was put on wrist support and took methyl prednisolone injection with an impression of EPL and FPL tendinitis. The pain persisted and developed swelling. On physical examination has tenderness over the thenar eminence. On investigation complete blood count showed hemoglobin of 12.9 g/dl, white blood cell count of 8000/ul and platelet of 387K. Renal and liver function tests were within normal range. Radiography showed lytic permeative lesion with cortical destruction, aggressive hair on end type periosteal reaction and soft tissue swelling seen over the left first metacarpal dis-

tal meta epiphyseal region (Fig. 2). Non contrast CT showed lytic destructive lesion with soft tissue component which also crossed the MCP joint and involved the proximal phalanx but no internal matrix was seen (Fig. 3). MRI showed left first metacarpal distal epiphyseal and metadiaphyseal both T1 and T2 hypo intensity which shows post contrast enhancement and cortical destruction. Adjacent T1 isointense and T2 hyperintense to the surrounding muscle avidly enhancing soft tissue lesion is seen (Fig. 4).

### Discussion

Although bone metastasis is common, acral metastasis is rare but currently the reported cases are increasing which could be due to increased detection, higher life expectancy or incentive to publish rare findings [5,6]. In the hand the most common site of metastasis is distal phalanx which is attributed to higher vascular flow and repeated microtrauma which reduces local tissue resistance this is important for tumor emboli to get settled easily and grow. Repeated trauma results in release of prostaglandin and other chemotactic factors which facilitates cell migration and adhesion [4]. Bronchogenic cancer is the commonest primary to metastasize to the hand. But no sufficient data exists on which histologic type is prone to metastasize to the hand [1]. Primary tumors infiltrate either systemic or portal veins and tumor emboli gets filtered by lung or liver. But in bronchogenic cancer the tumor directly invades the pulmonary veins and causes wide spread metastasis [6]. Other primary tumors that metastasize to the hand include breast, renal, thyroid and colon cancer [7].

The clinical presentation is variable and nonspecific. Patients may present with painful erythematous and warm hand [6]. During such presentations the differential diagnosis include inflammatory conditions like gout, tenosynovitis or rheumatoid arthritis and infections either osteomyelitis or

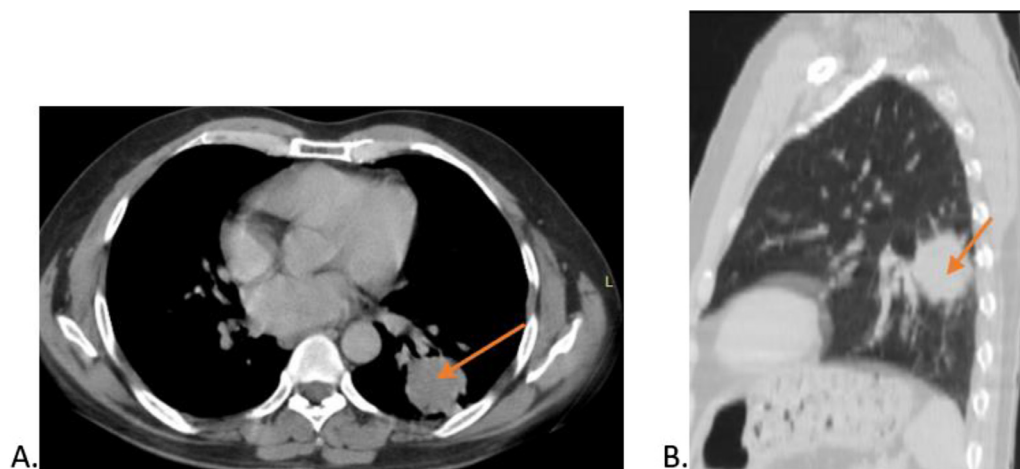
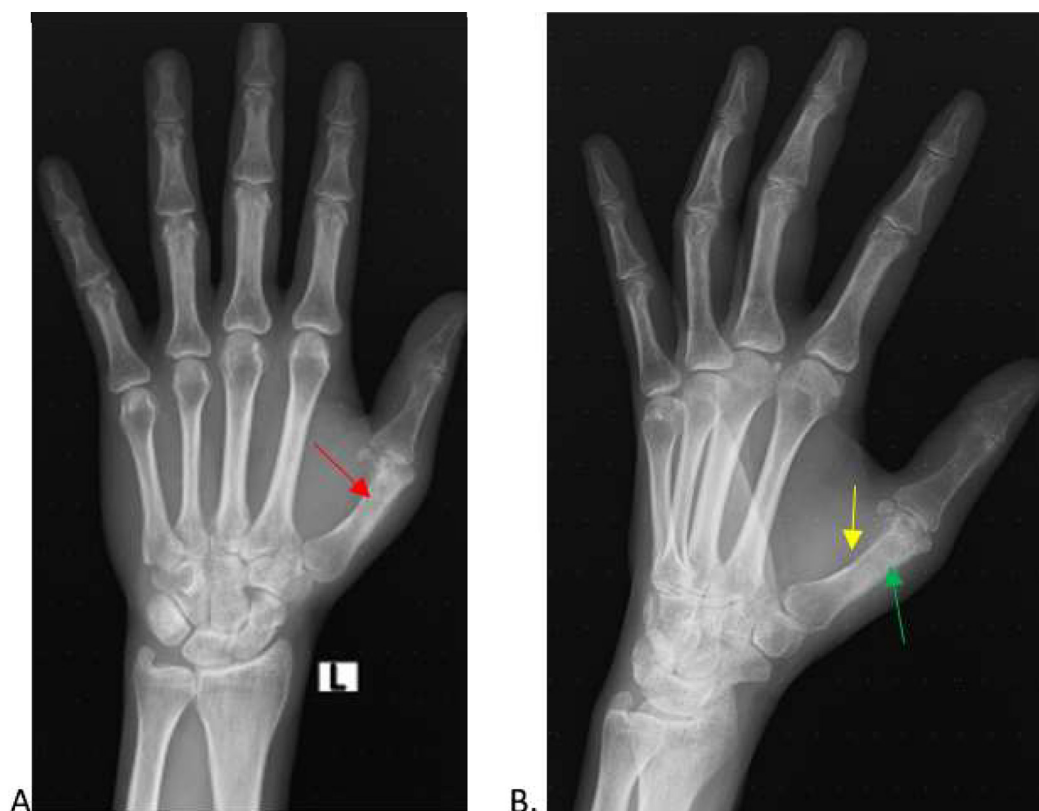
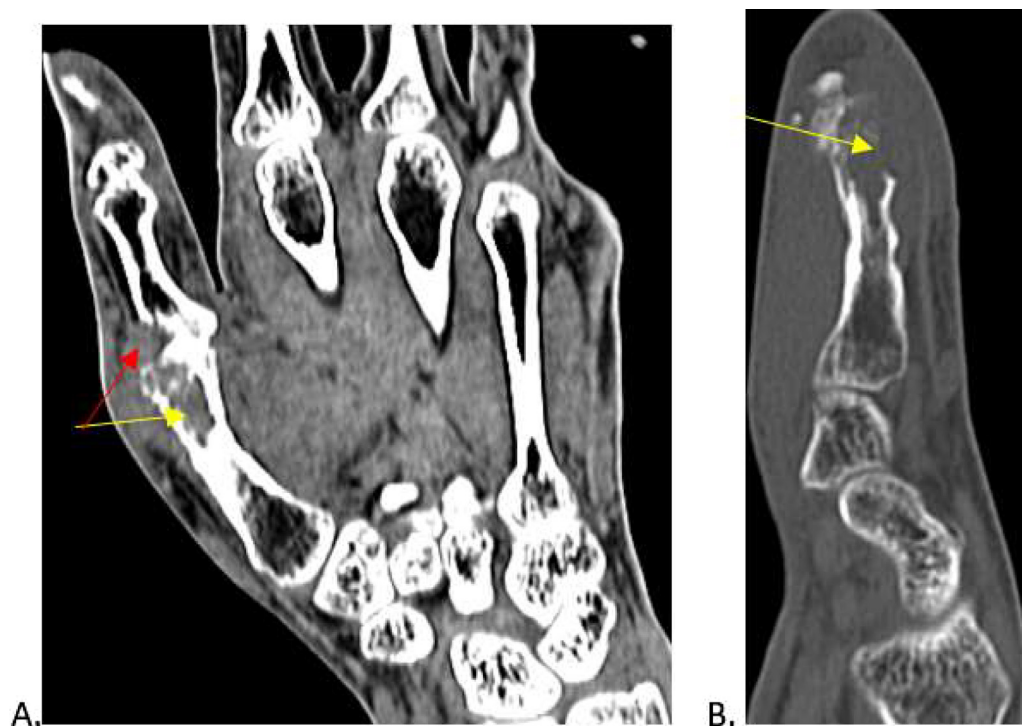


Fig. 1 – axial and sagittal chest CT, soft tissue (A) and lung (B) window shows soft tissue attenuating lesion over left lower lobe, which has spiculated margin.



**Fig. 2 – AP (A) and lateral (B) radiography of the left hand shows ill-defined lytic permeative lesion with wide zone of transition and cortical destruction (red arrow), aggressive hair on end type periosteal reaction (green arrow) and surrounding soft tissue swelling (yellow).**



**Fig. 3 – Coronal soft tissue window (A) and sagittal (B) bone window of left-hand shows lytic destructive lesion over first distal metacarpal (yellow arrow) and proximal phalanx (red arrow).**



**Fig. 4 – T1 (A) and T2 (B) coronal, T1 axial post contrast (C) images show left first metacarpal distal meta epiphyseal lesion with destructed cortex and intramedullary hypointensity on both T1 and T2 and shows contrast enhancement with surrounding soft tissue component which is T1 and T2 t1 iso, to hypointense to surrounding muscle which shows avid post contrast enhancement Ultrasound guided biopsy was taken from the mass and showed adenocarcinoma infiltration (Fig. 5).**

septic arthritis [6,7]. In our case the patient presented with thumb pain and swelling which was long standing and repeatedly treated with anti-pain with the impression of inflammatory condition-tenosynovitis.

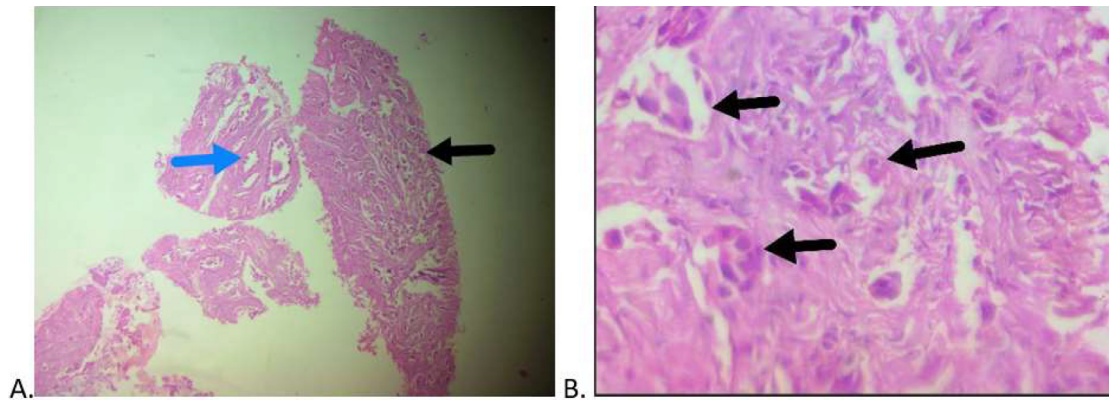
Presence of metastasis signifies advanced disease and poor prognosis with a mean survival period of 6 months to 1 year [1,7]. In around 16% of cases hand metastasis may be an initial presentation [2,6].

Diagnosis requires high degree of suspicion and imaging. Plain radiography is the initial and affordable modality. There is no specific imaging appearance described in hand metastasis but usually lytic aggressive lesions with soft tissue component will be seen. MRI is the modality of choice due to

lack of radiation and high sensitivity and specificity to detect and characterize metastatic lesions. Definitive diagnosis is by histopathology [3]. In our case diagnosis was confirmed by histopathology.

There is no standard treatment guide line for hand metastasis as it depends on the type of tumor, presence of other site metastasis and patients preference [3]. Management options include amputation proximal to the nearest uninvolved joint for limited disease [5]. But reconstructive surgery is not advocated as they have poor prognosis [6,8]. Treatment is usually palliative, chemotherapy or local radiotherapy will reduce tumor bulk and reduces pain [9].





**Fig. 5 – Hematoxylin and Eosin (H&E) stain (A 100 × magnification) shows infiltrating tumor cells arranged in duct like structures (blue arrow) and infiltrating tumor cells into underlying stroma arranged in small nest to ducts to single cells (black), (B 400 × magnification) show pleomorphic polygonal cells having high N:C ratio, indistinct eosinophilic cytoplasm, and prominent nucleoli infiltrating the fibrotic stroma (black arrows).**

Our patient was managed with local radiotherapy over the site of metastasis/ left first metacarpal and he is on palliative chemotherapy.

## Conclusion

Benign tumors and pseudotumors are by far more common than metastasis in the hand but it's crucial to have high index of suspicion in patients with long standing protracted hand pain and swelling. Here we reported a biopsy proven case of left first metacarpal bone metastasis from lung adenocarcinoma who was initially treated with antipain with the impression of tenosynovitis.

## Author contributions

All authors contributed to the conduct of this research and read and approved the final version of the manuscript.

## Ethics approval and consent to participate

Not applicable.

## Availability of data and materials

The data supporting the findings of the case are available upon request to the corresponding author.

## Patient consent

Written informed consent was obtained from the patient for anonymized patient information to be published in this article.

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