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Case report

Rare malignant adnexal tumour of the skin involving distal phalanx of right thumb with co-existing primary lung cancer in a 72-year-old patient: A case report

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ABSTRACT

Introduction and importance: Malignant adnexal tumours of the skin are a group of rare malignancies. These tumours can further differentiate into eccrine, apocrine, sebaceous, sweat duct, or ceruminous glands within the skin or follicular cells. Sebaceous carcinoma, a malignant adnexal tumour of the skin, is a rare and malignant tumour of the sebaceous glands. They can occur anywhere in the body where sebaceous glands are present, the most common being the head and neck region.

Case report: Here we report a case of a 72-year-old man who presented with a bleeding ulcer on the distal right thumb, which was progressively increasing in size. Biopsy and histology confirmed the diagnosis of MATS with sebaceous differentiation. He had been diagnosed with metastatic non-small cell lung carcinoma six months back.

Clinical discussion and conclusion: SC is a rare and unusual tumour amounting to less than 1% of all cutaneous malignancies. Phalanges are an infrequent extra-ocular site of involvement, and initial presentation can be mistaken for a benign occurrence. Any patient presenting with extra-ocular SC is advised to undergo genetic and immunohistochemistry testing to rule out complex genetic syndromes like Muir Torre syndrome and Cowden syndrome.

1. Introduction

Adnexal tumours of the skin include a broad spectrum of skin epithelial tumours, including hamartoma, hyperplasia, and benign and malignant tumours that originate from or show differentiation according to adnexal epithelial structures [1].

Malignant adnexal tumours of the skin (MATS) are one of the most uncommon groups of tumours. Due to their rarity, variance in behaviour and malignant potential, they pose a diagnostic challenge for surgeons and pathologists [2]. Diagnosis is principally based on histopathology due to a non-specific clinical presentation. Variable histological entities are based on further differentiation from eccrine, apocrine, sebaceous, sweat duct, or ceruminous glands within the skin or follicular cells [3]. As these tumours originate from multipotent stem cells, these cells can express one or more lines during neoplastic transformation. The type of differentiation present in each tumour is identified using histopathologic characteristics that correspond to the typical adnexal structure [1].

Most of these tumours are locally aggressive with limited ability for metastasis. Their clinical presentation is usually unremarkable, and they may present as an ulcerating mass with bleeding. They often present as solitary, sporadic lesions; however, certain tumours may indicate the existence of some complex genetic syndrome such as Cowden's syndrome, Birt-Hogg-Dubé syndrome and Muir Torre syndrome [4].

MATS are usually managed with surgery by wide local excision to ensure tumour-free margins, with or without removal of regional lymph nodes, or Mohs microscopic surgery. Perioperative radiotherapy or chemotherapy should be considered in the case of aggressive tumours. It is challenging to perform radical surgery microscopically. Hence adjuvant or neoadjuvant therapy, particularly radiotherapy, should be considered for the patients to achieve local tumour control [5]. This work has been reported in line with the SCARE criteria [6].

Abbreviations: MATS, malignant adnexal tumours of skin; SC, sebaceous carcinoma; IHC, immunohistochemistry; CECT, contrast enhanced computed tomography; MTS, Muir Torre Syndrome; CCPDMA, complete circumferential peripheral and deep margin assessment; WLE, wide local excision.

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2. Case report

72-year-old man presented to the emergency department in January 2022 with an ulcerated swelling of the right thumb. The swelling was first noticed a month back in the distal phalanx of the right thumb, which started as a nodule. The nodule enlarged progressively to its current size (Fig. 1) and started ulcerating one week prior to presentation, with the involvement of the overlying skin.

The nail bed was involved with necrotic slough seen on the floor of the ulcer. The patient also complained of bleeding from the margins of the wound, tenderness, and pain on movement. His past history was significant for primary non-small cell lung malignancy, which was diagnosed six months back. The patient and his family opted for palliative management as the patient was diagnosed with metastasis to the spine. He also had significant weight loss with loss of appetite and reported feeling weak. The patient did not give any history of bleeding per rectum, tenesmus, constipation or obstipation.

The patient had significant leukocytosis (26.4 k/mm^3) with a haemoglobin of 10.9 g/dl on investigations. His kidney function was grossly deranged, with serum urea of 170 mg/dl and serum creatinine of 1.44 mg/dl. His liver function test was significant for borderline elevation of hepatic enzymes, serum ALP level of 400 IU, hypoproteinemia, and hypoalbuminemia (2.5 g/dl). The patient was also found to be COVID positive. His chest x-ray showed a left pulmonary mass (Fig. 2). An X-ray of the patient's right thumb was taken, which showed complete destruction of the distal phalange with the destruction of the cortex. The interphalangeal joint appeared spared (Fig. 3). The ultrasound examination of his abdomen revealed no significant abnormality.

The patient developed shortness of breath on the fourth admission day and was shifted to the intensive care unit for further management. The patient continued to have leukocytosis (23.8 k/mm^3). On the ninth admission day, after stabilization, the patient underwent contrast-enhanced computed tomography (CECT) of the right hand, which showed a large soft tissue mass measuring 3 × 2 × 2 cm involving the distal phalanx of the thumb with destruction and expansion of distal phalanx. Multiple cortical areas of breakdown were seen with an extension of soft tissue to the dorsal aspect with lifting of the nail bed. Few prominent vessels were seen extending to the lesion. The interphalangeal joint of the thumb was spared. The lesion was extending to the palmar aspect of the distal-most part. The mass was found to have invaded and replaced the tendons and muscles, which could not be visualized separately. (Figs. 4, 5).

The patient was then advised for and underwent a biopsy of the lesion. Histopathological analysis was carried out on formalin-fixed, paraffin-embedded tissue sections, which were stained with hematoxylin and eosin. The tissue section (Fig. 6) showed partly skin covered and partly ulcerated tissue with trabecular sheets of atypical basaloid cells seen, along with many multivacuolated cells. Nuclei showed marked

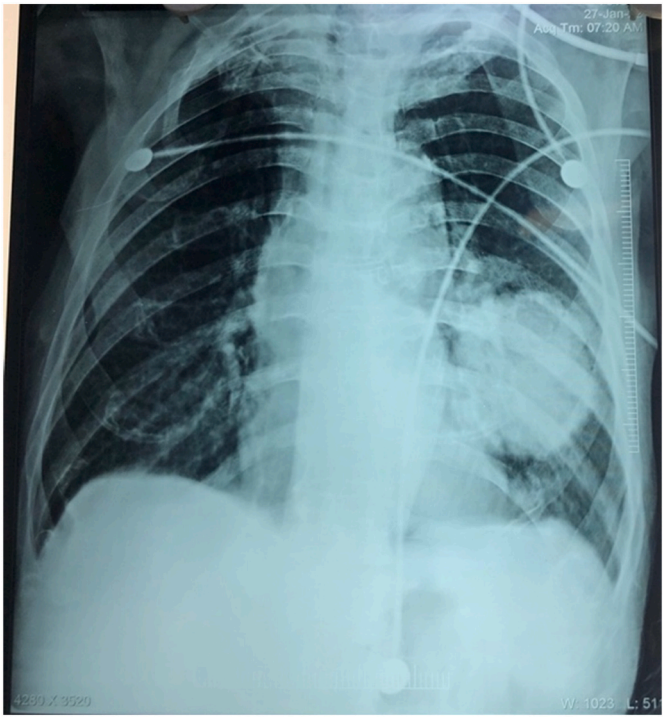


Fig. 2. Chest X-ray PA view showing solitary mass lesion on the left side of the chest.

atypia and angulation with numerous mitoses, including atypical mitosis. Areas of necrosis were seen throughout the section with the involvement of the resection margins. The biopsy was suggestive of malignant adnexal tumour of the skin with sebaceous differentiation.

The patient was further advised for MMR IHC (immunohistochemistry) markers (MSH2, MSH6, MLH1 and PMS2) to rule out Muir-Torre syndrome, which the family refused. The patient then underwent subtotal amputation of the thumb with disarticulation of the proximal phalanx of the thumb and metacarpal joint (amputation of his right thumb). The margins (both skin and bone) were clear of the tumour. The patient was advised for postoperative radiotherapy, but the family opted for palliative care. The patient was kept under regular follow-up for the wound dressing, and expired one month after the procedure.

3. Discussion

Sebaceous carcinoma is a differentiated form of malignant adnexal tumours of the skin. These tumours are quite rare, with an estimated

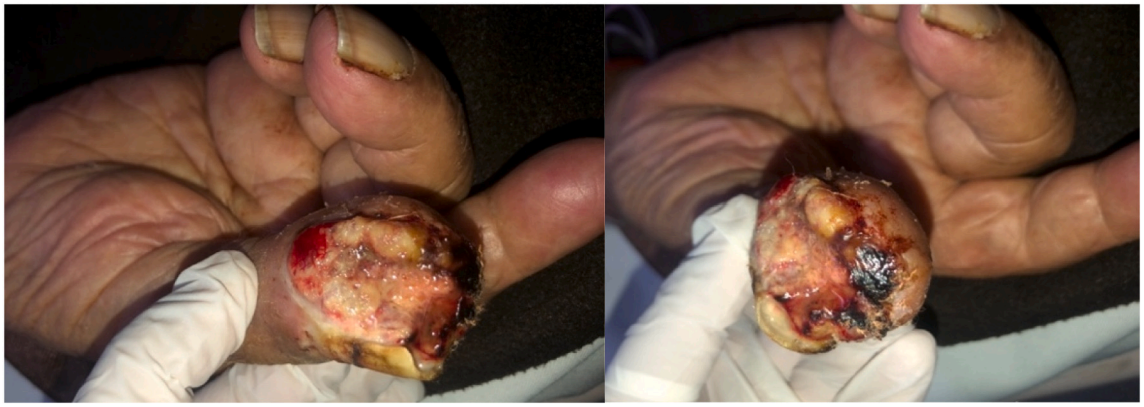
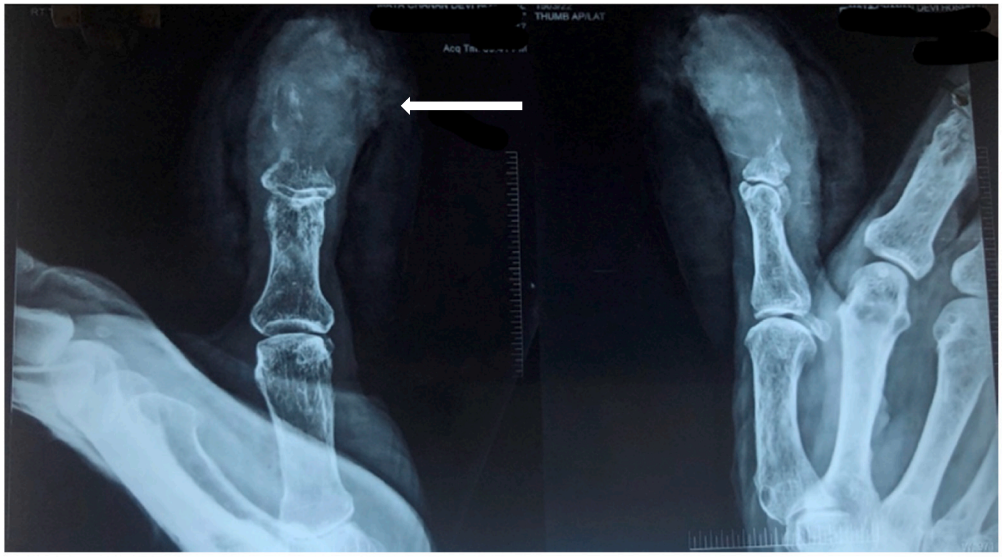
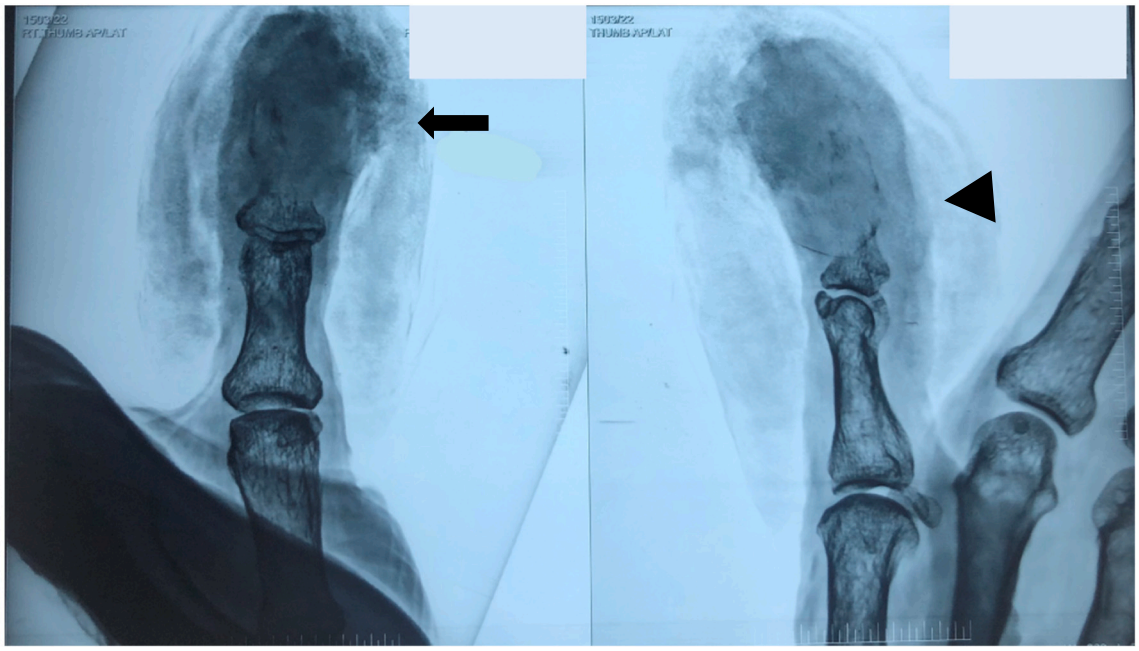


Fig. 1. Ulcerated lesion on the right distal phalanx of the thumb.



(a)



(b)

Fig. 3. (b): Xray right thumb showing mass lesion (black arrow) with the complete destruction of the distal phalanx with minimal cortical remnant (black arrowhead).

incidence rate of approximately 1 to 2 per 1,000,000 per year. They usually present in the sixth to seventh decade of life [7–9] and are more commonly seen in elderly males. They typically present as painless, gradually enlarging subcutaneous nodules and can easily be mistaken for benign swelling. They can rarely present as ulcerating and bleeding mass.

Approximately 80% of the cases occur in the head and neck region, with approximately 40% of these occurring in the ocular region (involving the eyelids). They are usually solitary lesions but, when present in multiple numbers, at unusual locations (extra-ocular), in association with other internal visceral organ malignancies, or in patients aged below 60 years; complex syndromes, such as Muir Torre syndrome and Cowden syndrome, should be suspected [10].

The differential diagnosis of sebaceous carcinoma includes several inflammatory lesions (especially when ocular such as a chalazion, blepharon or keratoconjunctivitis), sebaceous (epidermoid) cyst, basal cell carcinoma, squamous cell carcinoma, and the very rare cutaneous malignancies such as dermatofibrosarcoma protuberans and cutaneous B-cell lymphoma [11,12]. However, histopathological analysis helps confirm the diagnosis of malignancy and differentiate it from other diseases. In case of an initial benign diagnosis, the patient should be explained that any rapid increase in the size of the lesion or change in the overlying skin should warrant an immediate clinical review.

At the time of presentation, this particular patient had an ulcerated lesion on the right distal thumb that was bleeding. This prompted the patient and his family to seek a medical opinion. The patient gave a history of stage IV primary non-small cell lung malignancy with metastasis to the lumbar spine. He was on palliative therapy for the same

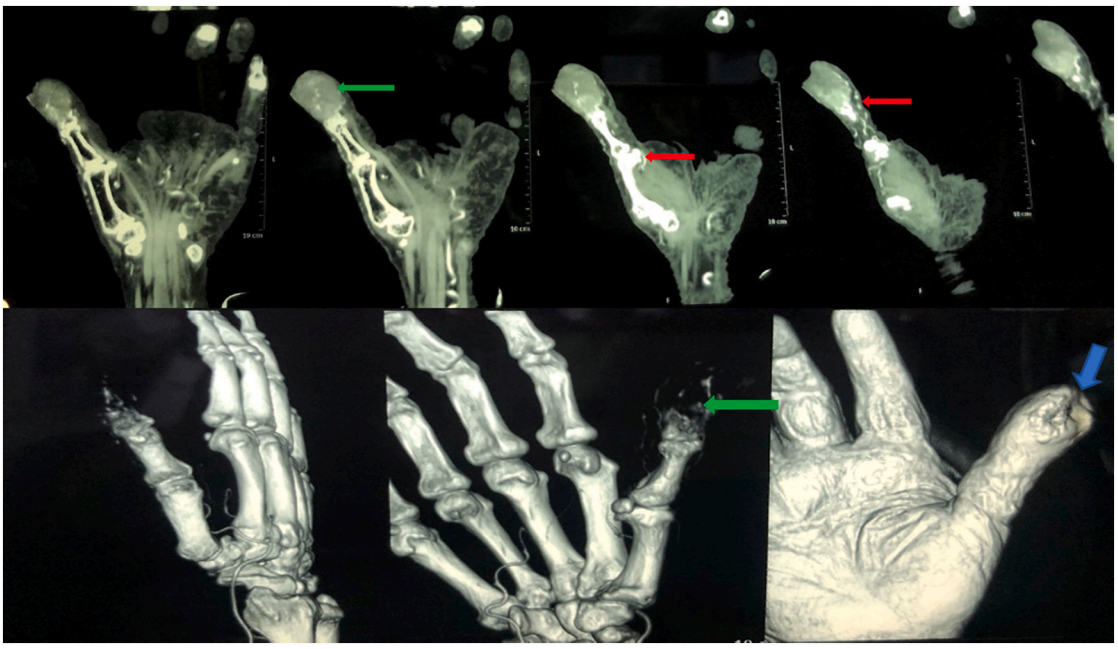


Fig. 4. CECT right hand showing mass lesion with bone destruction (green arrow) and increased vascularity (red arrows), blue arrow showing 3D reconstructed hand with bone destruction.

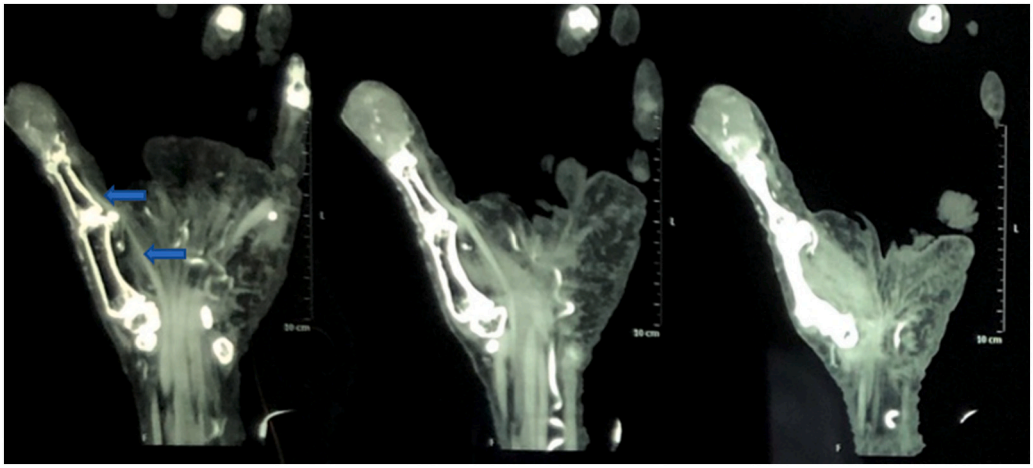


Fig. 5. CECT right hand showing mass lesion with increased vascularity, tendons and muscle not visualized with the complete destruction of the distal phalange of the right thumb. Tendons are visualized up to the proximal phalange (blue arrows)

with chronic pain management using morphine.

The patient underwent disarticulation of the proximal phalanx of the thumb and metacarpal joint (amputation of his right thumb). Histopathology confirmed the diagnosis of sebaceous carcinoma with tumour-free skin and bone margin.

Most of the sebaceous carcinoma (SC) occurs sporadically. SC is associated with Muir Torre syndrome (MTS) in a small subgroup of patients. MTS is an autosomal dominant disorder and is considered to be a variant of HNPCC (Lynch syndrome). It is characterized by the development of sebaceous carcinoma either preceded or followed by visceral malignancies, most commonly gastrointestinal or genitourinary malignancies.

Based on recommendations, genetic testing for MTS is recommended in patients with extra-ocular sebaceous carcinoma and a Mayo MTS overall risk score ≥ 2 [13–15].

The Mayo MTS score is calculated by adding the scores associated with the following four variables:

- Age <60 years at first presentation of sebaceous carcinoma (score = 1)
- $\geq$2 sebaceous tumours (score = 2)
- Personal history of any Lynch-related cancers (score = 1)
- Family history of any Lynch-related cancers (score = 1)

This patient presented with extra-ocular sebaceous carcinoma and, therefore, was advised for mismatch repair gene (MMR) IHC panel of MSH2, MSH6, MLH1 and PMS2. Early recognition and diagnosis of SC can help identify MTS and ultimately improve the morbidity and mortality of such patients. These patients then can undergo regular and long-term surveillance for the presence of other visceral malignancies that can be detected at an early stage and treated, improving their prognosis and survival rates [10].

The primary management of extra-ocular MATS is wide local excision (WLE) with a margin of 1 cm, down to the deep fascial plane or Moh's micrographic surgery. Depending on the presence or absence of

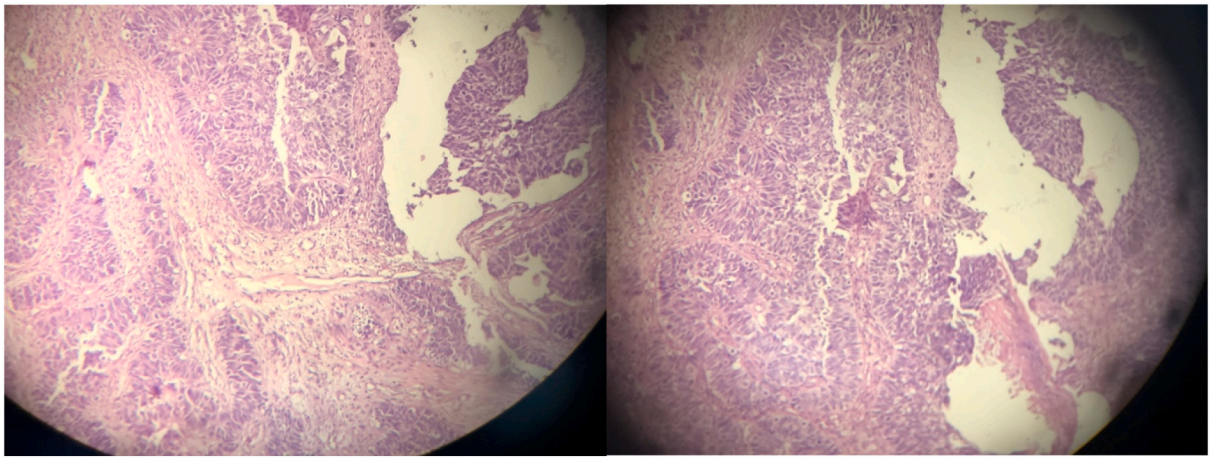


Fig. 6. Histopathology showing malignant adnexal tumour with sebaceous differentiation.

regional lymphadenopathy, WLE is combined with lymph node dissection. Mohs micrographic surgery or complete circumferential peripheral and deep margin assessment (CCPDMA) is the primary treatment modality for head and neck sebaceous carcinoma, including eyelid tumours [10,16,17]. Radiotherapy may be given as primary treatment or combined with surgery for ocular and extra-ocular tumours or unresectable tumours and metastasis. The overall recurrence rate for sebaceous carcinoma has been reported in 9 to 36% of patients, with distant metastasis occurring in 3 to 25% [18–20]. Patients with sebaceous carcinoma and MTS have a worse prognosis with decreased five-year survival rate. Patients are usually kept under extended follow up after the initial treatment, every six months for three years and annually after that. Patients diagnosed with Muir Torre syndrome and at-risk family members (first-degree relatives) should undergo a preventive cancer screening program for colorectal cancers. The screening should start at the age of 20 to 25 years (or earlier if colorectal cancer was diagnosed in the family before age 25 years) and for stomach and urogenital cancers starting at the age of 30 to 35 years.

4. Conclusion

This case report presents a patient with a rare form of skin cancer and a known history of Stage IV primary lung cancer. The patient and his family initially ignored the palpable nodule on his right thumb as it was painless and appeared benign. The patient sought medical attention when the lesion ulcerated and was associated with bleeding. However, concurrent COVID 19 infection delayed the investigations and management of the patient. Patients with such skin nodules, with atypical clinical features or concomitant malignancies, should be investigated further for MATS. A very high degree of suspicion is required for diagnosis as these malignancies are rare and difficult to diagnose by both the surgeons and the pathologist. Once a diagnosis of sebaceous carcinoma is established histologically, syndromes such as Cowden or Muir Torre should be considered. The patient should be advised to undergo tissue biopsy for immunohistochemistry and genetic testing, as these syndromes are caused secondary to germline mutations and carry high penetrance.

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Ethical approval

This is a case report study and ethical approval is not required.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Deepika Aggarwal: Data collection and literature review, analysis and interpretation, writing and manuscript editing, clinical diagnosis and management of the case.

Vimal Jain: Data interpretation and manuscript editing, clinical diagnosis and management of the case.

All the authors read and approved the final manuscript.

Registration of research studies

This case report does not require registration as a research study.

Guarantor

Vimal Jain.

Provenance and peer review

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Declaration of competing interest

The authors of this work have nothing to disclose.

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