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Acrometastasis following colorectal cancer: A case report and review of literature

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ABSTRACT

INTRODUCTION: Colorectal cancer commonly metastasises to the liver, peritoneum and lungs. Bony metastases are uncommon in colorectal cancer and in particular metastases to the hands or feet (acrometastasis) are an extremely rare occurrence.

CASE PRESENTATION: A 65-year-old male with a colonic malignancy underwent elective anterior resection. Intra-operatively he was found to have a pelvic collection necessitating an end colostomy. Histology confirmed complete Dukes B tumour excision with no evidence of lymph node metastases. The patient underwent chemo-radiotherapy but was unsuitable for reversal of Hartmann's due to elevated CEA levels and asymmetrical thickening of the rectal stump with a solitary lung nodule identified at a one-year surveillance CT. The lung nodule was resected revealing metastatic adenocarcinoma and biopsies from the rectal stump showed chronic inflammatory changes. The patient was offered further chemotherapy. However, six years after his original surgery the patient presented with an acutely painful left foot with radiographic appearances of an infiltrative sclerotic and lucent lesion confirmed as a calcaneal acrometastasis on Magnetic Resonance Imaging (MRI).

DISCUSSION: Diagnosis of acrometastasis is challenging and generally constitutes a wider metastatic process with poor prognosis. Patients are often asymptomatic or present with symptoms mimicking benign lesions such as arthritis, infection or ligamentous sprains of the hands or feet. Therefore, there should be a high index of suspicion and prompt radiological investigation is warranted in order to exclude disease recurrence.

CONCLUSION: Although acrometastasis may indicate a poor prognosis, timely diagnosis and intervention may facilitate improvement of long-term survival and symptomatic management.

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1. Introduction

Colorectal cancer is the fourth most common cancer in both men and women in the UK and is only exceeded in its incidence by breast, lung and prostate cancers [1]. The prognosis depends on the stage of disease at presentation with 5-year-survival rates of up to 90% in patients with the most localised (Dukes A) disease. Approximately 20% of colorectal cancers have metastases at presentation with a 5-year survival for distant metastatic disease of less than 10% [2]. Colorectal cancer commonly metastasises to the lungs, liver and peritoneum with bony metastases being relatively uncommon, occurring in 6% of all metastatic colorectal cancers [3]. Metastases to the hands or feet, from any malignancy, are rare and affect as few as 0.3% of all cancer patients [4].

Patients who have undergone radical treatment for colorectal cancer are routinely reviewed for five years with endoscopic examination of the remaining large bowel; blood tests including Carcino-Embryonic Antigen (CEA); and Computed Tomography (CT) imaging of the chest, abdomen and pelvis. Routine surveillance for bony metastases in colorectal cancer is not advocated due to its rarity. When bony metastases do occur they are usually accompanied by wide spread metastases to other organs and rare in isolation [4].

In this report, we describe a patient who underwent curative resection and adjuvant chemo-radiotherapy for colorectal cancer in whom no recurrence was detected at five-year follow-up, who then presented with left calcaneal acrometastasis as a first sign of disease recurrence.

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2. Presentation of case

A 65-year-old Type II diabetic male with a distal sigmoid tumour was admitted for a planned anterior resection and primary anastomosis. Intra-operatively he was found to have a previously undiagnosed pelvic collection. This precluded primary anastomosis and an end colostomy was fashioned. Histology confirmed complete excision of the pT₄ N₀ M_x, Dukes B tumour with no evidence of lymph node metastases in the 20 excised lymph nodes examined. In preparation for reversal of his Hartmann's procedure, a routine repeat CT scan, one year post-operatively, showed asymmetrical thickening of the rectal stump and a solitary lung nodule. Consequently at this stage, he did not undergo Hartmann's reversal and several further investigations were necessary due to the results of the CT Scan. His CEA level was elevated at 37 mcg/L (Normal: 0–4.9). Endoscopic biopsies of the rectal stump showed chronic inflammatory changes and no evidence of recurrent disease. The lung nodule was resected and confirmed to be a metastasis from an adenocarcinoma, most likely of colorectal origin. After discussion at the multidisciplinary meeting, the patient underwent further adjuvant chemotherapy. In the 5-year follow-up, his CEA levels returned to normal and repeat CT scans of the chest, abdomen and pelvis did not reveal any local or metastatic recurrence. In addition to the standard surveillance he had repeat rectal stump biopsies, none of which revealed histological evidence of recurrence. Six years after his original surgery the patient presented with an acutely painful left foot. Antero-posterior and lateral ankle radiographs were performed, revealing only mild degenerative changes. The symptoms were treated conservatively, however, the ankle pains persisted and there was increasing swelling around the ankle joint. A diagnosis of Charcot's joint was made in keeping with his diabetes. However, other differentials included ankle fracture, osteomyelitis, arthritis and bony metastasis.

Plain radiographs of the left foot and ankle when he presented with ankle pain revealed mild degenerative changes in the tibiotalar and mid-tarsal joints with a small plantar calcaneal spur (Fig. 1a). Due to his persisting ankle pains, repeat left foot radiographs were performed. These showed an infiltrative sclerotic and lucent lesion (Fig. 1b) which was confirmed as a metastasis on Magnetic Resonance Imaging (MRI) (Fig. 2a–c). An MRI of the pelvis revealed changes consistent with recurrence of his colorectal cancer at the superior aspect of the rectal stump and his CEA levels were elevated once again at 54 mcg/L.

Following a multidisciplinary team meeting and review of results of investigations the patient was listed for an elective foot amputation for symptomatic pain relief management. This unfortunately was deferred due to recurrent hospital admissions with adhesional small bowel obstruction that were successfully managed conservatively.

One year after the diagnosis of ankle metastasis, follow-up CT scans of the chest, abdomen and pelvis revealed a thickened rectal stump with a 19 mm soft tissue nodule at its apex and multiple metastatic lung lesions. Following the patient's wishes, the recurrent disease was treated palliatively, with no surgical intervention.

3. Discussion

Skeletal metastases occur in 20–30% of all malignancies; however, it is uncommon in colorectal cancer (4–6% of patients). Bony metastases in colorectal cancer usually reflect widespread metastatic disease with a poor prognosis [5]. Colorectal cancer typically metastasises to the lungs, liver and peritoneum due to the pattern of venous and lymphatic drainage of the colon and rectum via the portal system. The presence of surface signalling proteins in the lungs and liver increase the propensity for metastasis to develop there [6].



Fig. 1. a. Mild degenerative changes. b. Infiltrative sclerotic and lucent lesion.

Isolated metastases to the foot or hand from any malignancy are extremely rare occurring in 0.3% of all cancer cases [7,8]. Published data on acrometastasis have reported lung, kidney, breast, endometrium, prostate and rarely colon cancers as likely primary sources. Metastases to the hands interestingly are three times more common than those to the feet with the exception of colorectal cancer [4,7,9]. A literature search revealed four reports of acrometastasis of colorectal origin [6,7]. Three of these cases had acrometastasis to the feet affecting either the calcaneus, metatarsal or cuboid bones [6]. The remaining case had acrometastasis to the index finger distal phalanx [7]. Additionally, individual cases of colorectal cancer metastasis to the sternum and scapula have been described [8,9].

The exact mechanism of acrometastasis remains unclear and several hypotheses have been proposed. Venous drainage into the valve-less venous plexus of Batson, which communicates with



Fig. 2. a, b and c. Acrometastasis of left calcaneous.

the vertebral column, makes the vertebral column a common site for bony metastases [10]. It is hypothesised that Batson's venous complexes communicate with the vessels of the lower extremities facilitating acrometastasis to the feet [11]. In a series of experiments, Batson also suggested paravertebral venous plexuses can have retrograde flow, especially during valsalva manoeuvres, enabling blood flow to bypass the heart and lungs [8]. Based on

this suggestion, it is possible that acrometastasis can occur in the absence of other distant metastases.

Acrometastases are more commonly noted in the hands, particularly the dominant hand. The presence of red marrow in the bones of hands, yet absent in the bones of the feet, may explain the increased frequency of hand acrometastasis [13]. The discrepancy in prevalence of dominant hand acrometastases may be as a result of increased blood flow in that limb [12].

Foot acrometastasis may present with a number of symptoms including swelling, warmth, erythema, ulceration and most commonly pain [14]. Painless foot acrometastasis presenting as a non-tender swelling have also been reported [15]. Acrometastases can be mistaken for common pathologies including gout, rheumatoid arthritis, osteomyelitis and ligament sprains frequently delaying diagnosis and leading to inappropriate treatment [6]. Once diagnosed treatment options include bony reconstruction, surgical excision, amputation, radiotherapy or conservative treatment [6,7]. These are all considered palliative measures as the majority of patients have additional metastasis elsewhere [6].

In particular, no patient with foot acrometastasis of colorectal origin was reported to survive greater than 13 months from diagnosis [6]. They were treated with either bony reconstruction, radiation or palliated with analgesia [6]. Nonetheless, there was a single case of long-term survival greater than 18 months for a patient with hand acrometastasis of colorectal origin treated with ray amputation of the index finger distal phalanx [7]. Survival (>5 years) has been reported in a patient with solitary calcaneal acrometastasis from endometrial carcinoma. The patient initially underwent hysterectomy followed by post-operative systemic chemotherapy, hormonal therapy and local radiation to the affected foot [15].

Patients who have had a resection for colorectal cancer undergo regular clinical examination; estimation of CEA levels; endoscopic examination of the remaining large bowel; and regular CT imaging of the chest, abdomen and pelvis. Routine examination of the limbs is not undertaken in colorectal cancer as recurrence or metastases to the lungs, liver and peritoneum are much more likely before bony involvement would be expected.

Although acrometastasis to the foot is a rare occurrence, it should be included in the differential diagnoses of patients presenting with a painful foot or hand with a previous history of malignancy. Thorough history and clinical examination along with appropriate investigations in a timely manner are crucial for the early identification and treatment of such lesions.

4. Conclusion

Acrometastasis from any malignancy and colorectal cancer in particular is a rare occurrence and therefore routine surveillance is not indicated. However, in patients with a background of previous colonic resection for malignancy with unusually persistent symptoms in the hands or feet, indicative radiological investigation is warranted to exclude disease recurrence. If disease recurrence is confirmed management strategies should be guided by a multidisciplinary approach and are dependant on the stage of disease recurrence. Treatment options include surgical excision, amputation, radiotherapy or conservative measures alone as palliative measures. Although acrometastasis may indicate a poor prognosis, timely diagnosis and intervention may facilitate improvement of long-term survival and symptomatic management. The presented case has been reported in accordance to the SCARE criteria [16].

Conflict of interest

The authors declare that they have no conflict of interest.

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None.

Ethical approval

The authors declare ethical approval was not required for this case study.

Consent

Written informed consent was given by the patient for publication of this case report along with the accompanying images. A copy of this consent form is available to the Editor-in-Chief of the journal upon their request.

Author contribution

All authors contributed substantially to the conception, design and coordination of the case report as well drafted the final manuscript.

Guarantor

Mr Kozar Agha, Mr Khalid Akbari and Mr Syed Hussain Abbas accept full responsibility for the manuscript and decision to publish it.

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