CASE REPORT
ORTHOPAEDIC ONCOLOGY AND INFECTIONS

Cutaneous adenoid cystic carcinoma: clinical conundrum of a lower limb mass

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Abstract

Background

Adenoid cystic carcinoma is a rare epithelial tumour of the salivary glands.

It arises even more rarely in the aerodigestive tract, lacrimal glands and adnexal skin glands. Acral metastasis is a rare presentation of carcinoma of unknown origin. Head and neck malignancies with acral metastasis are extremely rare.

Case report

We present our case of metastatic adenoid cystic carcinoma presenting in the form of a tumour arising from an adnexal skin gland of the foot.

Discussion

The case is an example of atypical presentation and dilemma in diagnosis of adenoid cystic carcinoma (histopathological confusion). To our knowledge there is no case in the literature with similar clinicopathological highlights.

Conclusion

Corroborative information is crucial for accurate diagnosis and appropriate management of patients by multidisciplinary teams. The need for timeous presentation and treatment for masses, even if clinically asymptomatic, is also highlighted.

Level of evidence: Level 5

Keywords: cutaneous adenoid cystic carcinoma

Background

Adenoid cystic carcinoma (ACC) is a rare epithelial tumour of the salivary glands.[1-3] It arises even more rarely in the aerodigestive tract, lacrimal glands and adnexal skin glands.[1,2] Acral metastasis is a rare presentation of carcinoma of unknown origin with incidence ranging from 0.007% to 0.3%.[1,2] Head and neck malignancies with acral metastasis are extremely rare.[1-3]

Case report

A 39-year-old male with no known comorbidities presented to our Orthopaedic outpatient department with a skin lesion on the left foot, first noted 19 years prior. The lesion was initially excised at his local hospital. There was recurrence of the lesion with progressive involvement of the bones of the foot over ten years, with an increase of associated pain over the last three years. Our patient reported recent loss of weight accompanied by a diminished appetite. Previous significant medical history noted pulmonary TB in 2010 with occasional alcohol consumption and a five pack/year smoking history. He was previously employed as an underground mine worker.

Examination

The patient appeared well overall, although with bilateral superficial inguinal lymphadenopathy. He had an antalgic gait on the left but walked unaided. The foot had multiple, well-circumscribed, firm to hard, non-tender bony masses of variable sizes. Distal lower limb perfusion and sensation were intact. Importantly, skin nodules similar to the one initially seen on the left heel were discovered in the left axilla and the left mandibular area. Systemic examination was otherwise unremarkable.

Anteroposterior and lateral views of the left leg showed multiple lytic and cystic lesions of the tibia, fibula and tarsal bones. A large, diaphyseal lytic skip lesion was also noted in the tibia (*Figure 1*). CT of the left leg revealed multiple foci of permeative lytic bone lesions with wide zones of transition and soft tissue expansile components involving the fourth metatarsal, all cuneiforms, cuboid, talus, calcaneus distal tibia, distal fibula and the medullary cavity

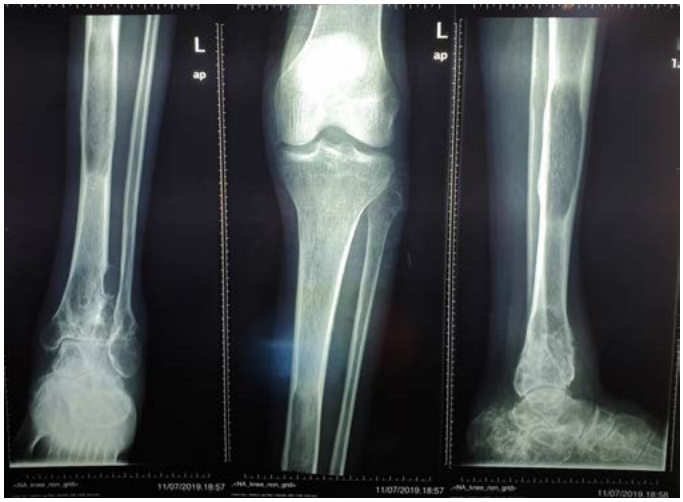

Figure 1. X-ray of the left leg

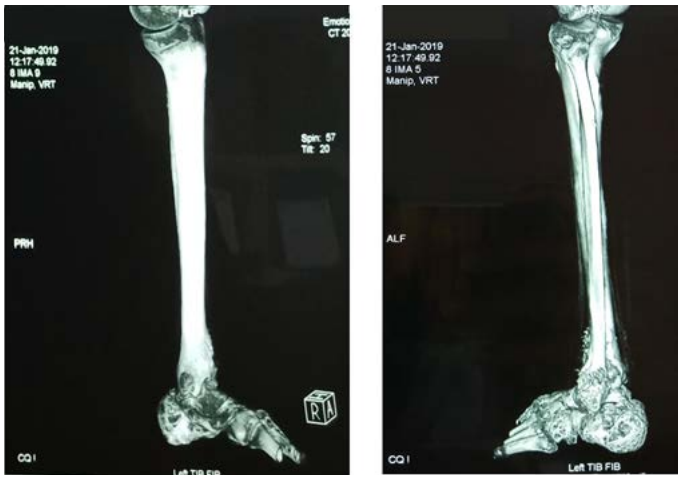

Figure 2. CT images

of the proximal tibial shaft, suggestive of diffuse metastatic disease (*Figure 2*). MRI of the foot revealed multiple lobulated bony lesions, which were T1 hypointense and T2 hyperintense, involving the distal tibia, distal fibula, tarsals and the first and second metatarsals (*Figure 3*).

Laboratory and radiological workup

All blood investigations were within normal limits. Biopsy of the skin lesion of the foot suggested an ACC with angiolymphatic invasion but no perineural invasion. The lesion extended to the superficial margin only.

Staging CT revealed diffuse chest and abdominal metastasis. Photomicrographs of the tumour cells showed low, intermediate and high-power magnification views of the tumour stained with haematoxylin and eosin. Tumour cells showed positive staining with CK7, CD117 and S100 (*Figure 4*).

Management

With the provisional diagnosis of metastatic ACC and extensive involvement of the left foot and proximal tibia, he was offered definitive palliative loco-regional control with an above-knee amputation, followed by chemoradiation treatment with a multidisciplinary team approach. The biopsy specimens from the above-knee amputation had extensive tumour cell degeneration but the features were suggestive of an extraskeletal myxoid chondrosarcoma. Subsequent biopsies of skin nodules from the arm and jaw were suggestive of the same chondrosarcoma diagnosis. This posed a diagnostic and therapeutic challenge, since the patient now had to be changed to an anthracycline-based chemotherapy regimen to address the new diagnosis. All available biopsies were resubmitted to achieve a conclusive diagnosis, which turned out to favour the initial pathology of ACC. Final histopathology report on the submitted leg specimen showed clear margins.

Discussion

ACC is a rare malignancy thought to account for 10% of all salivary gland malignancies.[4-9] In 60–70% of cases the minor salivary glands are affected.[4,5,7-9] Occasionally rare cases can originate from the extra-salivary tissues.[5-7] Black Africans are the second most commonly affected race after Caucasians and before Asians, although race is usually not documented in most studies.[8] The tumour has a slight female predilection in most studies, with one study reporting an equal sex distribution.[4,6-9] ACC seems to peak in incidence between the fifth and sixth decades of life.[4-9] Our patient however, in his late 30s, had a primary arising from an adnexal gland in his foot. The latter and his black African descent may also be deemed to be negative prognostic factors. The entity is rarely seen below the age of 30 years.[5]

ACC is notorious for late presentation due to its characteristic slow growth pattern, a presentation similar to our case, accounting for the majority of cases.[4-9] The other usually dreaded growth pattern is that of a rapidly progressive tumour with early metastasis and poor clinical outcomes; this is the least common growth pattern noted in literature.[4] The development of a painless mass around the head and neck region is by far the most common scenario of presentation.[4-9] This may be the reason that most cases present late. Our case ironically had a left foot skin nodule as the primary site of the ACC. He too, however, presented typically late due to lack of pain from these tumours. The longest duration of time from onset of primary tumour to metastatic symptoms at presentation is 22 years in the literature.[5] Our patient presented 19 years from the onset of the primary tumour in the foot.

Histologically three subtypes of ACC have been documented, namely: cribriform, tubular and solid types, depending on predominant tissue type appearing microscopically.[9] The commonest type, the cribriform type, has a better prognosis over the solid undifferentiated type.[4,6-9] Our patient's histology fortunately showed a predominantly cribriform tissue type. Ironically, primary head and neck tumours and their visceral metastasis are typically asymptomatic but bone metastases typically present earlier with gradually increasing pain.[4-8] The latter was not true with respect to our patient as pain and swelling in his left foot and ankle had only troubled him over the last three years prior to presentation. When head and/or neck pain is a presenting symptom, neural tissue involvement is usually the cause, although nerve palsy could also present in a painless fashion.[8] ACC has a low local or regional invasion rate compared to other malignancies.[6,8] Our patient had associated axillary and inguinal nodes at presentation. Distant metastases are infrequent and are only documented in 15% of the patients.[2,5] When present, however, they are associated with a dismal overall prognosis, which atypically was not true in our case.[2,3,5] In the literature, the typical radiological appearance of acral metastasis is similar to our case with a permeative to destructive appearance of the bone involved, with variable soft tissue involvement on CT and MRI scans of the affected limb.[2,5] Traditionally, treatment for patients with acral metastasis is usually palliative, due to disseminated disease at presentation as well the poor outlook with regard to the primary tumour at diagnosis.[1-3] Our case had disseminated disease on staging workup which typically would spell a grave prognosis with other disseminated tumour

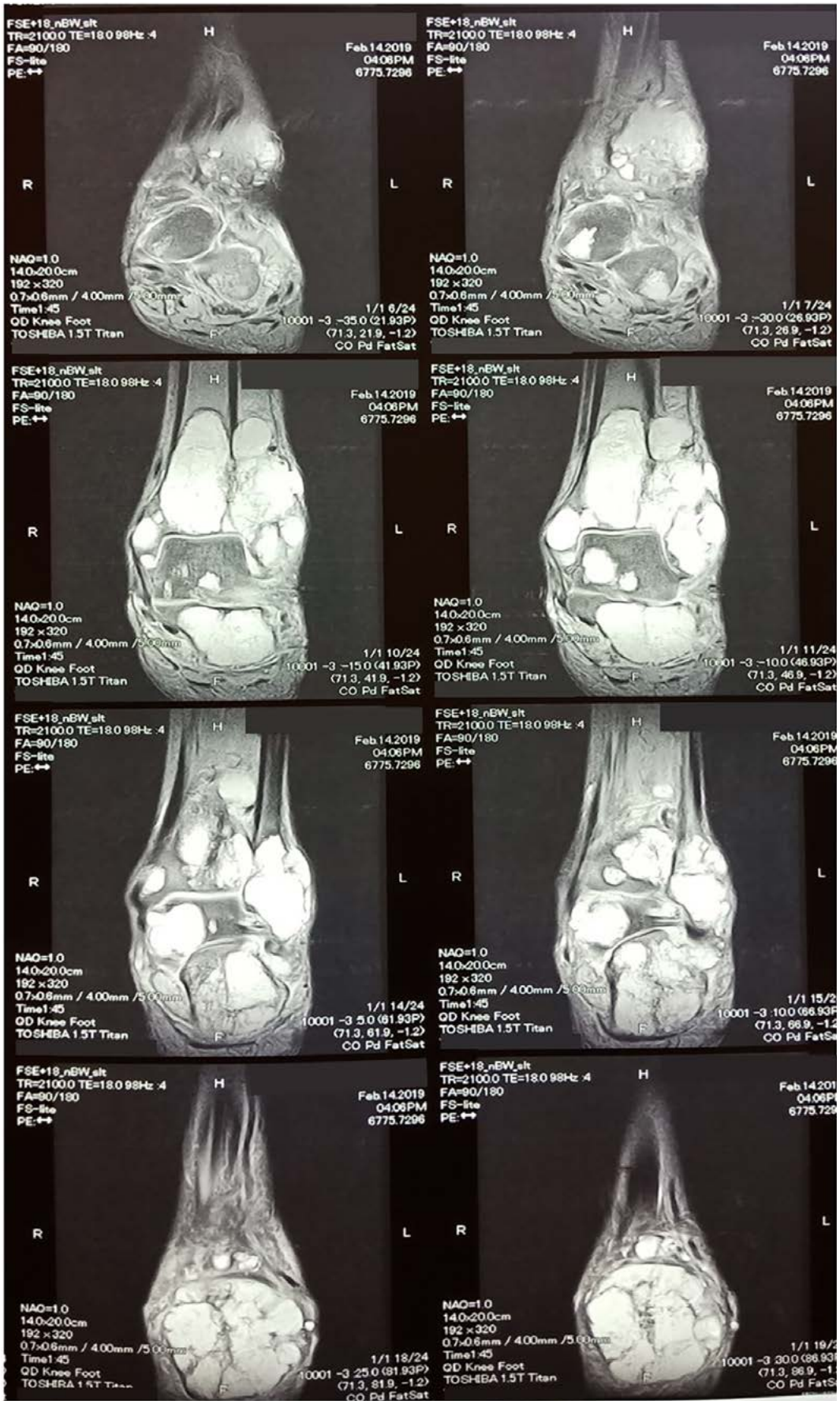

Figure 3. MRI images

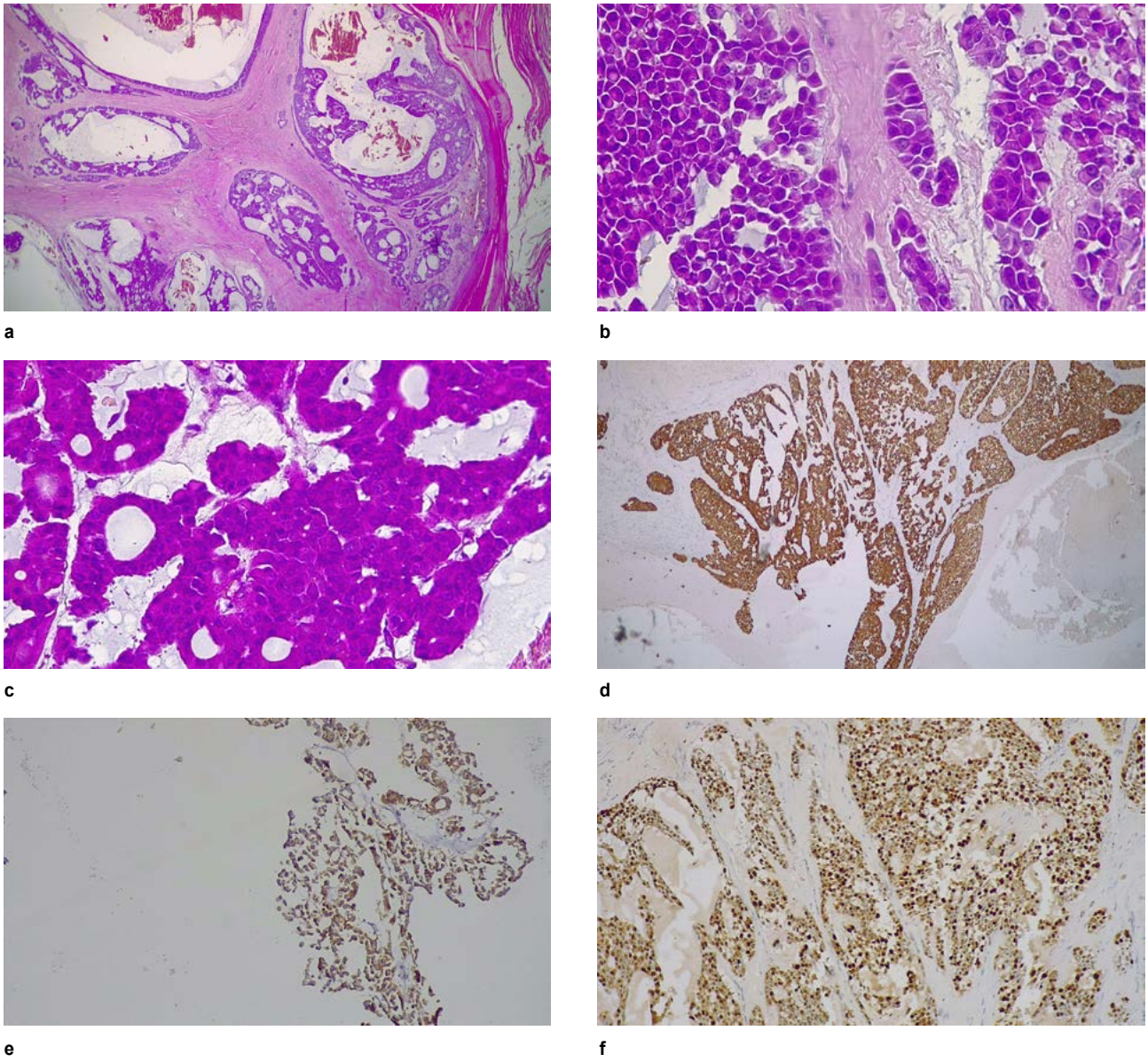

Figure 4. Photomicrographs of tumour cells – low, intermediate and high-power magnification views of tumour stained with haematoxlin and eosin. Tumour cells show positive staining with CK7, CD117 and S100. a) low power 2.5× magnification, H&E image of the neoplasm; b) intermediate magnification at 10×, H&E image of the neoplasm; c) high power, 40× magnification, H&E image of the neoplasm; d) diffuse positive staining of the neoplastic cells with CK7; e) positive staining of the neoplastic cells with CD117; and f) positive staining of the neoplastic cells with S100

diagnoses. However, this is not always the case with ACC. Due to the overall slow, indolent growth pattern, the following phrase has been coined: 'patient can symbiotically live with their tumour for prolonged periods of time'.[4] Protocols that involve combinations of surgical excision with postoperative radiotherapy give good results initially; however, in up to 70% of cases the initial outcomes will be negated by local recurrences.[7] The recurrence rate seems to worsen the longer the duration is since surgery.

For ACC acral metastasis, treatment entails wide margin excision in the form of an amputation with postoperative irradiation of the residual stump.[10] Primary ACC is treated similarly with wide margin excision and radiation. The former and latter were both offered to our patient with above-knee amputation and mandibular, axillary and inguinal mass surgical excision.[11] However, due to typical late presentation in most cases, the chances of clear marginal excision for the head and neck is limited by local vital anatomical structures in which case palliative radiation therapy may relieve pressure symptoms and also aid with sterilising tumour margins.[8-10]

Our patient consented to an above-knee amputation, which was reported to have clear margins by the pathologist. At last follow-up he was still asymptomatic and ambulant on crutches, awaiting his prosthetic limb fitting.

Conclusion

The case cited above is an example of both atypical presentation (young, male, black African with primary arising in an adnexal skin gland) and dilemma in diagnosis of ACC (histopathological confusion). Due to conflicting histopathological reports, the management of the patient had to be modified from loco-regional control with radiation to anthracycline-based chemotherapy. This shows how corroborative information is crucial for accurate diagnosis and appropriate management of patients by multidisciplinary teams. Our clinical case also highlights the need for timeous presentation and treatment for masses, even if clinically asymptomatic.

Ethics statement
The author/s declare that this submission is in accordance with the principles laid down by the Responsible Research Publication Position Statements as developed at the 2nd World Conference on Research Integrity in Singapore, 2010.
Prior to the commencement of the study, ethical approval was obtained from the following ethical review board: University of the Witwatersrand Human Research Ethics Committee (Medical) Certificate no. M220495.
All procedures were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Informed written consent was obtained from the patient for being included in the case report, as well as for the use of radiological images and histopathology slides; these images were adequately anonymised.

Declaration
The authors declare authorship of this article and that they have followed sound scientific research practice. This research is original and does not transgress plagiarism policies.

Author contributions
SP: contributed to case report conceptualisation, data collection, manuscript preparation
MPK: contributed to manuscript preparation, ethical clearance and supervision

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