

CASE REPORT

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# Diagnostic dilemma in disseminated TB could be fatal: lesson learned through a bitter encounter

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## Abstract

A definitive diagnosis of soft tissue cystic swelling is challenging, as clinical and imaging findings might misguide the clinician and delay timely diagnosis and treatment as well as outcome. The radiological features of tubercular cysts often overlap with that of sarcoma or metastatic cancer. Involvement of a multidisciplinary team, tissue biopsy, and histopathology should supplement standard diagnostic testing and imaging to confirm the diagnosis and avoid delay in treatment. We report a case of multiple cystic swelling of the upper limb, ankle, and pelvis mimicking metastatic ovarian cancer which was later diagnosed as a case of disseminated tuberculosis.

**Keywords** Cystic swelling, Disseminated tuberculosis, Sarcoma, Metastatic tumor

## Background

Cystic masses account for great challenges to the clinicians, especially while differentiating malignancy from tuberculosis (TB) as both are two of the most common diseases worldwide, obtaining an annual incidence of 23.6 million and 10.6 million respectively [1, 2]. They are often misdiagnosed for each other due to similar clinical presentations and radiographic characteristics which cause delay in initiation of the treatment [3, 4]. Since cancer has a worse prognosis and requires more medical resources, a misdiagnosis implies huge psychological stress and economic burden to TB patients [3].

Anti-TB treatment for cancer without confirmation of diagnosis worsens the situation; likewise, wrong or delayed diagnosis of TB leads to poorer prognosis and a higher likelihood of relapse [5]. Failure to distinguish between TB and cancer results in many otherwise avoidable losses despite several reported cases. Thus, the nuances between cancer and TB should be described and summarized through more case reports and review papers.

We report a case of a postmenopausal woman with multiple cystic swelling in the upper limb, ankle, and ovary which was initially diagnosed as metastatic ovarian tumor, eventually confirmed as a case of disseminated TB by tissue diagnosis. Despite treatment with anti-TB chemotherapy, she finally succumbed to death due to delay in initiation of the treatment.

## Case presentation

A 52-year-old female patient with hyperlipidemia and hypertension was referred to the Department of Orthopedics with a ruptured cystic lesion over the left olecranon process (Fig. 1). Detailed history revealed that the patient developed an elbow swelling which had increased

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**Fig. 1** Ruptured cystic lesion over the left olecranon process



**Fig. 2** Swelling at right ankle

in size over the past 6 months. The patient was a non-smoker and non-alcoholic. She had no complaints of cough, chest pain, night sweats, or fever, but she experienced malaise, anorexia, and loss of body weight. After 3 months of the appearance of the first swelling, she noticed another swelling at her right ankle (Fig. 2). She was referred to an orthopedic specialist by a general physician where a plain radiograph and an MRI of the elbow were advised. While waiting for the follow-up at

orthopedic clinic, she developed a high-grade fever which was continuous in nature and not relieved completely by taking paracetamol. Two days after the development of the fever, the cyst ruptured spontaneously. After that, she was brought to the emergency department of our center. On further query, she mentioned that she had no relevant medical or family history, no history of use of recreational drug, and no history of travel in the last year. She denied any history of contact with TB patients as well; however, she mentioned that over the last 6 months, she lost about 10 kg of body weight and gradually developed bilateral lower limb weakness that eventually made her wheelchair bound lately.

On general examination, the patient was below average build, anemic but non-icteric, and there was no significant peripheral lymphadenopathy. On local examination of the elbow, a painful sinus over the left olecranon process with exposed bone and discharge was noted. There were two more palpable, cystic swellings: one at the sternal edge of the left clavicle (5 cm×4 cm) and the other over the right ankle (8 cm×6 cm) were revealed. The swellings were non-mobile, attached to the underlying structure but not to the overlying skin, non-fluctuating, and had smooth surfaces with well-defined margins. Abdominal examination revealed a palpable, soft non-tender mass in the suprapubic region. Her vitals were within normal limits with a mild rise in the temperature (99° F). Examination of other systems was unremarkable except for a bilateral lower limb motor and sensory deficit.

The patient's total leukocyte count was 8410 k/cu mm with neutrophilia. ESR was 58 within the first hour. An old X-ray of the left elbow, which was done before the rupture of the cyst, showed a well-circumscribed globular cyst over the olecranon process (Fig. 3), and the MRI of the elbow showed an ill-defined, irregular, bone eroding mass at the left elbow with cystic and solid components which was suggestive of an aggressive and malignant soft tissue tumor (Fig. 4).

An ultrasonogram of the whole abdomen was done and revealed a large solid pelvic mass measuring 10.2 cm×8.5 cm, suggesting an ovarian tumor. For further evaluation, she was referred to a gynecologist.

The following day, copious foul-smelling discharge from the bones and soft tissue was drained on an incision and drainage procedure of the ruptured cyst. Discharge and tissue biopsy were taken for bacterial culture and histopathology. The culture of the discharge revealed no conventional bacterial growth.

Meanwhile, a gynecological examination found the cervix appeared grossly unhealthy with erosion and bleeding on contact. A centrally arising adnexal mass was noted. The CT scan of the thorax and abdomen was done and



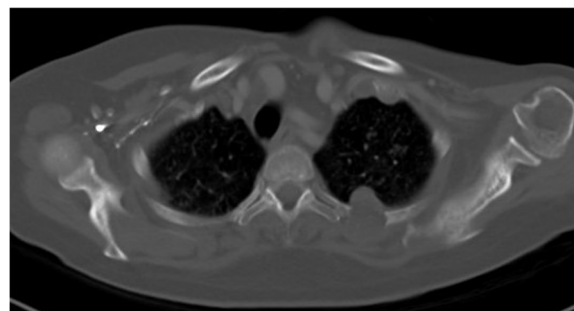
**Fig. 3** Well-circumscribed globular cyst over the olecranon process



**Fig. 4** An ill-defined, irregular, bone eroding mass at the left elbow



**Fig. 5** CT scan of the thorax and abdomen revealing an ovarian malignancy with metastasis to the peritoneum



**Fig. 6** CT scan of the thorax and abdomen revealing ovarian malignancy with metastasis to the bone



**Fig. 7** CT scan of the thorax and abdomen revealing ovarian malignancy with metastasis to the lung

revealed an ovarian malignancy with metastasis to the lung, bone, and peritoneum (Figs. 5, 6, 7 and 8). The MRI scan of the spine revealed a compression fracture at the level of T8–T10 with retropulsion of the postural fragment of T8 into the spinal canal with cord compression suggesting secondary metastasis to bone (Fig. 8). The CA-125 level was 92.2 U/mL. All these features made the suspicion of metastatic ovarian tumor more concrete, while the absence of classical features of tuberculosis

kept the clinicians completely incognizant of the possibility of disseminated TB.

With the above positive findings supporting an ovarian metastatic lesion, she was scheduled to undergo surgery for ovarian mass. In the meantime, the histopathology (HP) report of the elbow swelling biopsy was received. The report revealed fragments of tissues with areas of



**Fig. 8** MRI scan of the spine revealing a compression fracture at the level of T8–T10

caseous necrosis rimmed by epithelioid histiocytes and lymphocytes with well-formed epithelioid granulomas. Ziehl–Neelsen staining was positive for acid fast bacilli. Moreover, the bony sections showed fragments with the marrow spaces filled with caseous necrotic materials and a focus of infiltration by epithelioid histiocytes and lymphocytes. Histopathology was diagnostic of tuberculous lesion (unfortunately, due to technical issue, histopathology slides were not available).

The histopathology report completely averted the diagnosis, and the patient was referred to the respiratory medicine clinic and started antitubercular therapy. She was also referred to a spine surgeon for the management of the cord compression. The patient was scheduled for a follow-up after 3 months. With regular dressing and multidisciplinary management, her elbow lesion was improving, but her general condition did not improve significantly. Meanwhile, she was confined to home dressing due to the COVID-19 pandemic, and she lost the follow-up. Eventually, when she was contacted by our team for further follow-up after 6 months, she was found demised in another hospital. Diagnostic dilemma led to a delay in definitive diagnosis, initiation of appropriate treatment, and eventually death of the patient.

## Discussion

Tuberculosis has the highest preventable morbidity and mortality rates globally. The extrapulmonary involvement, and negative microbiological tests, leads to numerous differential diagnoses including sarcoidosis, metastatic cancer, lymphoma, and fungal infection [4]. False-positive positron emission tomography/computerized tomography (PET/CT) findings, history of malignancy, and elevated carbohydrate antigen 125 (CA 125) or CA 19–9 levels lead to the misdiagnosis of TB as cancer. On the other hand, a history of TB, positive

tuberculin test, and rare cancer plays a role in misdiagnosing cancer as TB.

This reported case was presented with multiple cystic swellings with skeletal involvement as a periosteal reaction with trabecular and cortical destruction. As involvement of bones, joints, and extra vertebral tissues in TB is rare, other pyogenic infections, metastatic lesions, and sarcoidosis were considered as differentials [6].

The radiological investigation did not reveal any marrow edema, intraosseous abscesses, or abnormalities of adjacent muscles and extraosseous soft tissues (such as edema, abscess, fistula) in this patient. The ultrasound sonogram of the abdomen, the CT scan of the thorax, abdomen, and pelvis report, along with the moderate rise in ESR and serum CA-125 level suggested an ovarian neoplasm with a compression fracture of the vertebrae metastasizing to the lung, bone, and peritoneum.

As metastatic lesions have precarious consequences, clinical findings suggesting any neoplasm make clinicians inclined to outweigh cancerous lesions to TB and to proceed with the cancer management protocol. Moreover, there are no pathognomonic clinical features or imaging findings for the definite diagnosis of extrapulmonary TB. Therefore, TB involving the gastrointestinal or genitourinary tract can easily be confused with peritoneal carcinomatosis and advanced ovarian carcinoma [7]. The absence of classical features of TB in our patient, *with no significant risk factors and a negative standard HIV test*, led the clinicians to initially misdiagnose the case of disseminated TB as ovarian cancer.

Although CA-125 has a high specificity (98%), sensitivity (58%), and serum CA-125 level rises in over 80% of patients with ovarian cancer, using this parameter as a sole diagnostic marker can lead to clinical mistakes. In our case, a rapidly growing ovarian mass with elevated serum CA-125 level rationalized an initial diagnosis of ovarian malignancy.

As extrapulmonary TB could be very ambiguous, differential diagnoses should be thoroughly ruled out. Several approaches should be applied to confirm the diagnosis. Mycobacterial culture is the gold standard method for the diagnosis of tuberculosis, though it has a long incubation period of 2–8 weeks [8]. Histological staining, Mantoux test, nucleic acid amplification, and other immunological tests should be performed before excluding the possibility of mycobacterial infection. Especially in endemic countries, abscesses in uncommon sites should be dealt with a high degree of suspicion for TB. Our case portrayed a comprehensive example of how extrapulmonary TB could lead to misdiagnosis. This report further emphasized that although the presence of a pelvic mass associated with ascites, high CA-125 levels, and peritoneal seeding strongly suggests pelvic

malignancies, the possibility of miliary TB, tubercular peritonitis, or ovarian TB with peritoneal seeding should always be considered to avert unnecessary surgery and to start timely appropriate therapy. If we could have diagnosed this patient as disseminated TB and started anti-TB chemotherapy early, the death of the patient could have been avoided.

A multidisciplinary approach is essential for the diagnosis and the treatment of any cystic swelling of the extremity with complications. As disseminated extrapulmonary TB can imitate many other diseases due to its diverse presentations, as happened in the case of our patient, a definitive diagnosis can be elusive. The biggest challenge of management is early diagnosis of TB, detection of drug resistance, and availability of highly active chemotherapy. Keen observation of patient's physical findings and adequate clinical knowledge are vital to address the diagnostic challenges of extrapulmonary TB which could prevent the treatment delay by facilitating the on-time diagnosis.

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#### Authors' contributions

MZA, consultant radiologist who reported all radiological investigations including X-ray, ultrasound, CT, and MRI and reviewed the manuscript. TJY, manuscript preparation and review. TAJ, manuscript preparation and review. CRM, manuscript preparation and review. RSI, manuscript preparation and review. ASBM, attending orthopedic surgeon who operated on and managed the patient, prepared, and reviewed the manuscript.

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#### Availability of data and materials

All imaging and histopathology reports are readily available, except for the histopathology slides, which are not available due to technical issues.

#### Declarations

#### Consent for publication

Consent for publication was taken at the time of preoperative consent take-up.

#### Competing interests

The authors declare that they have no competing interests.

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