

An Unusual Presentation of Tuberculosis at Atypical Anatomical Location: Rectus Abdominis Muscle

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ABSTRACT

Unusual presentation of Tuberculosis (TB) in anatomical locations like skeletal muscle which are atypical and not favourable for survival and multiplication of *Mycobacterium tuberculosis*. Commonly, muscle involvement is secondary. A direct inoculation (abdominal lymph node) or extension from underlying tubercular synovitis and osteomyelitis may involve an abdominal muscle. The case report is about a 43-year-old female who presented with an abdominal lump for past one month. There was no history of cough, weight loss, pain abdomen, recurrent vomiting, breathlessness and no history of TB or close contact with TB patient. Ultrasound (USG) and Contrast Enhanced Computed Tomography (CECT) of the abdomen revealed loculated collection in right rectus abdominis muscle, and USG-guided aspiration for cytology, culture and Cartridge Based Nucleic Acid Amplification Test (CBNAAT) confirmed tubercular abscess. The patient was managed as per National Tuberculosis Elimination Programme and responded well with antitubercular drug therapy for six months. The present case throws light on to the possibility of tubercular infection in atypical anatomical locations as primary foci, especially in those areas where tuberculosis is endemic.

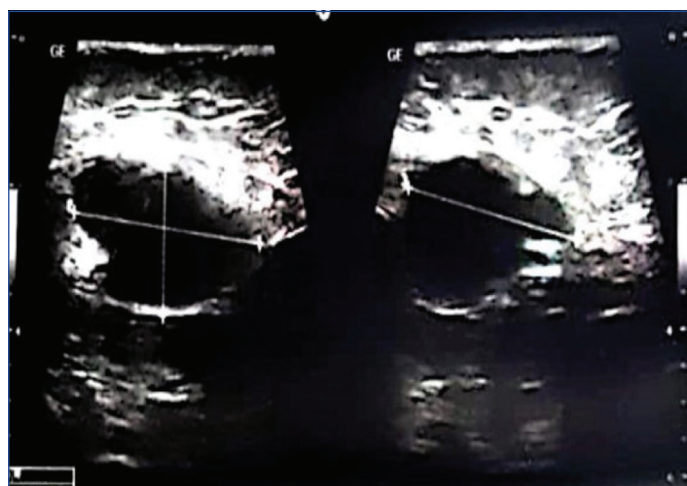
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CASE REPORT

A 43-year-old female patient presented with complaint of gradually increasing swelling over anterior abdominal wall for past one month. She also complained of pain at the site of swelling, while coughing. There was no history of trauma or similar swellings elsewhere in the body. No previous history of tuberculosis/malignancy, hypertension, diabetes mellitus, chronic respiratory disease or irregularities in menstrual history. Patient was multiparous, with two male children (both full term vaginal deliveries) and last child birth was 15 years back. There was no family history of tuberculosis, hypertension, diabetes mellitus.

Physical examination of the patient revealed a single non tender, well defined swelling of size 3×3 cm on the anterior abdominal wall to the right of midline in the hypochondrial region. The swelling was cystic in consistency and did not disappear when the anterior abdominal muscles were made taut. There was no local rise of temperature. There was neither generalised lymphadenopathy nor any lymphnodes on the typical sites, i.e, cervical, axillary, supraclavicular, inguinal. No abnormalities were detected on routine systemic examination.

Chest X-ray was normal. Complete blood counts and biochemical profile was within normal limits (haemoglobin was 12.3 mg/dL, Total Leucocyte Count (TLC) was 6800/cumm, neutrophils were 65, lymphocytes were 28, monocytes were five, eosinophils were two, platelet count was 1,90,000/ μ L. Serum total bilirubin was 0.5 mg/dL, serum direct bilirubin was 0.2 mg/dL, Aspartate Aminotransferase (AST) and Alanine aminotransferase (ALT) was 17 U/L and 21 U/L, respectively, Serum creatinine was 0.9 mg/dL. Fasting and post prandial blood sugar were 89 mg/dL and 130 mg/dL, respectively. Erythrocyte Sedimentation Rate (ESR) was raised (65 mm/hr). C-Reactive Protein (CRP) was elevated (7.47 mg/L). Viral markers i.e, Human Immunodeficiency Virus (HIV), Hepatitis B surface antigen (HBsAg), Hepatitis C antibody test, were negative. Ultrasound (USG) of the abdomen revealed loculated collection in right rectus abdominis muscle measuring 30×28×33 mm (10 cc), with anechoic-echo genic contents, floaters and few septae. Peripheral vascularity seen. No other significant abnormality was seen on USG examination [Table/Fig-1].



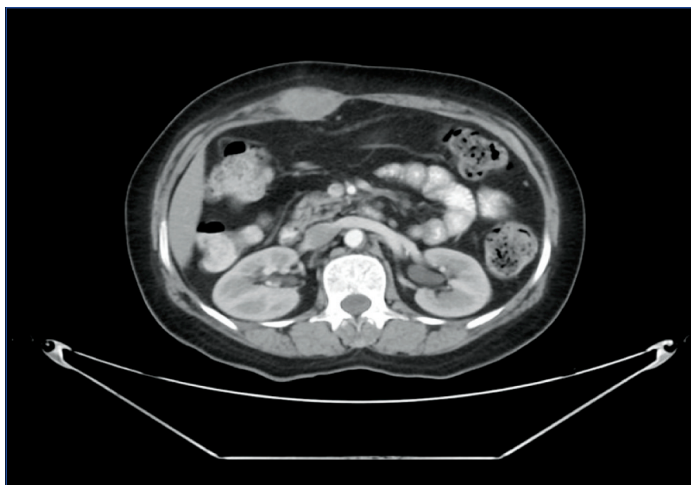
[Table/Fig-1]: USG showing anechoic with echogenic contents, floaters and few septae in right rectus abdominis muscle.

The patient was further evaluated with Contrast Enhanced Computed Tomography (CECT) scan of abdomen which revealed loculated thick collection (9.7 mL) in anterior abdominal wall involving the rectus sheath in right side epigastric region bulging intraperitoneally [Table/Fig-2]. Differential diagnosis of rectus muscle abscess, infected haematoma of rectus muscle and exophytic hepatic abscess with extension into rectus muscles were considered based on clinical and radiological findings.

Ultrasound-guided aspiration of the swelling was done and sample was sent for microscopy, culture and Cartridge Based Nucleic Acid Amplification Test (CBNAAT). Aspiration cytology revealed presence of chronic inflammatory cells with few epithelium cells. However, there was no evidence of acid fast bacilli or caseous necrosis on microscopic examination of the aspirate. The CBNAAT detected *Mycobacterium tuberculosis*, which was sensitive to rifampicin.

In view of the above, the patient was diagnosed to have tubercular cold abscess of anterior abdominal wall. Incision and drainage of the abscess was done [Table/Fig-3]. Patient was started on antitubercular drugs as per National Tuberculosis Elimination

Programme. The Antitubercular Treatment (ATT) regime consisted of two months of intensive phase (isoniazid 300 mg once daily, rifampicin 600 mg once daily, ethambutol 1200 mg once daily, pyrazinamide 1500 mg once daily, pyridoxine 40 mg once daily) and four months of continuous phase (isoniazid 300 mg once daily, rifampicin 600 mg once daily and pyridoxine 40 mg once daily). After two months of ATT regime, the swelling reduced in size significantly and was almost non palpable [Table/Fig-4]. There was no evidence of any fluid collection or discharging sinus, as evaluated clinically and radiologically.



[Table/Fig-2]: CECT abdomen showing loculated thick hypodense collection in upper rectus sheath.



[Table/Fig-3]: Wound after incision and drainage of abscess.



[Table/Fig-4]: Healed abscess after 6 months of ATT.

DISCUSSION

India has the highest burden of TB patients in the world with incidence being 159/lakh population in 2019 [1]. It has varied manifestations, most common being pulmonary tuberculosis. The commonest Extra-pulmonary Tuberculosis (EPTB) sites are lymph nodes, pleura, gastrointestinal, central nervous system and urogenital tuberculosis in western countries [2,3]. In Indian context, lymph node tuberculosis is the commonest EPTB site in children (0-14 years). However, a shifting pattern in EPTB site with increasing age has been documented and pleural tuberculosis is the commonest EPTB site in patients aged more than 45 years. This raises the possibility that the reactivation in pleura may be higher as the age increases [4]. Other common EPTB sites in decreasing order of frequency after lymph node and pleura are abdomen, bones and joints, skin and muscles [5-8]. Pollett S et al., reported the incidence of EPTB in decreasing order as lymph node, pleura, gastrointestinal, central nervous system, bone and genitourinary in tertiary care units of Australia [9]. Similar incidence was also reported by Sama JN et al., in United States of America [10]. Hence, the site of involvement of EPTB has remain the same irrespective of incidence in low or high prevalence areas.

An unusual presentation of Tuberculosis (TB) as anterior abdominal mass in an immunocompetent patient has been reported here. Musculoskeletal tuberculosis occurs in 1-5% of all TB cases among which anterior abdominal wall TB has been rarely reported [3,4,11-14]. The striated muscles are rarely affected by TB because chances of survival of *Mycobacterium tuberculosis* is significantly less as compared to other sites [15]. Inoculation from the caseous lymph nodes in the vicinity and dissemination of a primary focus via haematogenous route are the common modes of muscle involvement [16].

Srivastava P et al., reported a case of a 31-year-old immunocompetent male, who presented with an abdominal wall swelling for one and half months which was gradually increasing in size. The diagnosis was confirmed using USG-based Fine Needle Aspiration Cytology (FNAC), which showed the presence of acid-fast bacilli [17].

Another publication reported a lower abdomen swelling (left iliac fossa) tuberculosis in a 20-year-old immunocompetent female [18]. A similar case, was reported in a 40-year-old male who reported with an abdominal swelling for four months. Diagnosis in this case was confirmed by CBNAAT as histopathological examination failed to reveal presence of acid fast bacilli [19].

In all the three cases stated in [Table/Fig-5] [8-10], an immunocompetent patient presented with common complaints of gradually increasing, painless swelling over anterior abdominal wall with either minimum or no systemic features of tuberculosis like fever, weight loss, easy fatigability. There was history of tuberculosis in the past. There was no recent history of trauma, contact with tuberculosis patient. Differential diagnosis of rectus muscle abscess, infected haematoma of rectus muscle was considered, similar to the index patient.

In the present case, differential diagnosis of hydatid cyst was ruled out by a negative anterior indirect haemagglutinin test [17]. Infected haematoma was ruled out as aspirate was predominantly purulent and microscopy did not show presence of significant Red Blood Cells (RBC). Diagnosis of tuberculosis was confirmed on basis of microscopy or by CBNAAT. All the patients were managed with antitubercular therapy comprising of two months of HRZE and four months of HR. All the patients responded well to ATT. The abscess resolved over six months with no recurrence in form of abscess or sinus.

In the present case, the patient had an abscess in right rectus abdominis muscle. There was no significant bone or joint involvement. Investigations did not reveal any other active focus of infection in the body. The USG abdomen revealed thick walled peripherally enhancing lesions in abdomen. The CECT abdomen confirmed the findings of USG abdomensuggestive of abscess. The diagnosis of

Authors and year of publication	Age/Gender	History	Diagnosis	Treatment	Remarks
Zhang X et al., (2011) [8]	31 years/Male	Painless, gradually increasing swelling over abdominal wall	-USG and CECT abdomen. -Microscopy	2 HRZE+4HR	-
Pollett S et al., (2016) [9]	20 years/Female	Painless, gradually increasing swelling over abdominal wall	-USG and CECT abdomen. -Microscopy	2 HRZE+4HR	-
Sama JN et al., (2016) [10]	40 years/Male	Painless, gradually increasing swelling over abdominal wall	-USG and CECT abdomen. -Cartridge Based Nucleic Acid Amplification Test (CBNAAT).	2 HRZE+4HR	Microscopy was negative for AFB.

[Table/Fig-5]: Reported cases of abdominal wall TB in immunocompetent individuals [8-10].
H-Isoniazid, R-Rifampicin, Z-Pyrazinamide, E-Ethambutol

tuberculosis was established by USG-guided aspiration of abscess followed by CBNAAT testing of the aspirate. The treatment was by antitubercular drug therapy. In the present case, patient showed treatment response after four weeks of intensive phase of therapy. Patient was followed-up till completion of therapy.

The incidence in striated muscle is limited because of relatively high lactic acid content and profuse blood supply. Dissemination to muscle via lymphatic route is rare because of scarcity of reticuloendothelial cells and lymphatic tissue. The highly differentiated state of muscle tissue hinders the proliferation of *Mycobacterium tuberculosis* [20,21].

Involvement of abdominal muscles can be via two routes-haematogenous or via neighbouring lymph nodes or ribs [22]. Muscular tuberculosis clinically presents commonly as swelling and pain, which is usually insidious in onset and gradually progressive in size. Infection is usually restricted to one muscle [23]. There may be either a frank tubercular abscess or nodular sclerosis with calcification. Computed Tomography (CT) of the abdomen usually shows a well-defined abscess in the abdominal wall [24,25].

Culture and histopathological examination are gold standards for diagnosis of tuberculosis. The CBNAAT is an effective tool for rapid diagnosis. It also provides information on resistance of bacteria to rifampicin. Hence, National Tuberculosis Elimination Programme recommends use of CBNAAT for diagnosis. The sensitivity of Ziehl-Neelsen (ZN) stain for Acid-Fast Bacillus (AFB) and chest radiograph is very less. Hence, a negative ZN stain for AFB and normal chest radiograph does not rule out the diagnosis of tuberculosis, especially in patients with no contact history of tuberculosis and no active tubercular foci. Therefore, in countries like India, where the prevalence of TB is very high, a high index of suspicion is required for early diagnosis and treatment.

Tuberculous myositis is quite uncommon, with an incidence of 0.015-2% of total extra pulmonary tuberculosis [26]. The incidence of primary muscular TB is so rare, it is often misdiagnosed as muscular tumor without any bony involvement [21]. The diagnosis is essentially based on histology. However, in the present case, CBNAAT confirmed the diagnosis and CECT abdomen sufficed the extent of lesion.

The skeletal muscles are involved usually by a direct extension from a neighbouring joint or cold abscess but rarely by haematogenous spread [27]. A tubercular abscess arising in the costochondral junction may track downward, either lateral or medial to the linea semilunaris. If it extends lateral to the rectus, they spread downward between internal oblique and the transversus muscles, but if it extends medial to the linea semilunaris, it may spread into the sheath of rectus and may extend downward behind the muscle [16].

The multimodality approach of clinical evaluation, radiology and cytology imagery, molecular tests provide comprehensive evidence for diagnosis of skeletal muscle tuberculosis. The threshold for considering skeletal muscle tuberculosis as differential diagnosis should be kept low for timely treatment and to prevent complications especially in endemic areas [28,29].

CONCLUSION(S)

Despite the efforts of the TB elimination programs in endemic countries like India, incidence of extrapulmonary tuberculosis, especially in the atypical sites, is being constantly reported. Hence, clinicians should be vigilant in diagnosing atypical presentations of TB, thus reducing the morbidity and mortality.

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