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1 **Disseminated Tuberculosis with Rare Coccygeal Involvement: A Case Report**

2

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14

15 All author's reviewed and approved the final version of the manuscript

16 **1.4 Keywords**

17 Disseminated tuberculosis, Sacro-coccygeal tuberculosis, Elbow joint tuberculosis, GeneXpert
18 MTB/RIF, Immunocompetent

19

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21 All authors declare they have no conflict of interest

22

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27 No data was generated during this research or is required for the work to be reproduced.

28 3. Abstract

29 **Introduction** : Tuberculosis (TB) is a preventable and usually curable disease but remains a major
30 health problem worldwide, particularly in developing countries. TB of the lumbosacral junction is rare
31 and occurs in only 1% to 2% of all cases of spinal TB. Moreover, isolated sacrococcygeal TB is
32 extremely rare.

33 **Case report** : We present a case of a 64-year-old patient with a history of diabetes who presented with
34 chronic back pain and cough. Physical examinations revealed a peri-anal fistula and left elbow joint
35 arthritis. the patient is diagnosed with disseminated tuberculosis with coccygeal involvement. Diagnosis
36 was achieved non-invasively using Xpert MTB/RIF confirming Mycobacterium tuberculosis infection.
37 The patient experienced complete resolution of symptoms following the commencement of anti-
38 tuberculosis therapy .

39 **Conclusion** : We highlight the importance of this case due to the rare coccygeal localization of
40 tuberculosis in an immunocompetent patient, diagnosed through non-invasive means.

41 4. Introduction

42 Tuberculosis (TB) is a disease that can be prevented and is typically treatable. However, in 2022, it
43 ranked as the second leading cause of death from a single infectious agent, following coronavirus
44 (COVID-19), and claimed nearly twice as many lives as HIV/AIDS. Each year, over 10 million
45 people still fall ill with TB (1). Clinically, extra-pulmonary tuberculosis (EPTB) often goes
46 underrecognized, with diagnoses frequently delayed due to its paucibacillary nature and atypical
47 presentations. Factors such as HIV infection and female gender have been identified as risk factors for
48 the spread of EPTB. Diabetes is another key factor, as multiple studies have shown it to be associated
49 with a higher risk of developing active tuberculosis. Additionally, patients with diabetes have a
50 greater risk of developing EPTB compared to pulmonary tuberculosis (2). Disseminated tuberculosis is
51 defined as tuberculous infection involving blood stream , bone marrow , liver , or two or more non
52 contagious sites , or miliary tuberculosis the symptoms are nonspecific and the duration of symptoms
53 before diagnosis is variable . Around 15–25% of tuberculosis (TB) cases affect extrapulmonary sites,
54 leading to EPTB through the haematogenous and lymphatic spread of *Mycobacterium tuberculosis*.
55 The most common sites of EPTB include the pleura, lymphatic system, and musculoskeletal structures
56 (3) . Osteo articular tuberculosis represents between 1% and 3% of tuberculosis population with
57 variable incidence in endemic and non-endemic areas of the world (4) . The lower thoracic and
58 lumbar spine are the most common sites for spinal tuberculosis, whether it originates primarily or as a

59 result of pulmonary tuberculosis. In contrast, infection of the lumbosacral junction is quite rare,
60 occurring in only 1% to 2% of all spinal tuberculosis cases.

61 (5). We report a unique case of disseminated tuberculosis with rare sacrococcygeal involvement.

62

63 5. Case Presentation

64 A male patient of 64-year-old presented with a three months history of cough and severe back pain. He
65 reported prolonged fever and significant weight loss; there was no tuberculosis contagion. He had a
66 history of type 2 diabetes. The physical examination revealed a fistula in the peri-anal region with
67 purulent discharge (Figure 1). The motor and sensory examination of the lower limbs was normal and
68 there was no bowel or bladder incontinence. Osteo- articular examination finds a left elbow arthritis.
69 His respiratory, cardiovascular and abdominal system examinations were normal. A computed
70 tomography (CT) scan of thoracic, abdominal and pelvic revealed a consolidation of the left upper right
71 lobe with a cavity (Figure 2) fistulized at the parietal level with lysis of the D3-K3 costo-vertebral joint,
72 and the presence of coccygeal arthritis with an adjacent air bubble. Magnetic resonance imaging
73 (MRI) of the lumbosacral spine demonstrates a complex lesion centered in the left median and
74 paramedian retro rectal space, extending into the peri coccygeal region, the lesion is enhanced in its
75 periphery after gadolinium administration; soft tissue involvement and presence of a fistulous tract
76 (Figure 3). A CT scan of the elbow was performed which revealed a joint effusion severe osteopenia
77 (Figure 4). In laboratory investigations, hematologic examination was within normal except for
78 elevation in C reactive protein level. HBA1C = 7% witch indicated a balanced diabetes. He was tested
79 negative for HIV. The bacterial examination of the sputum and fistula discharge were acid fact bacilli
80 smear positive, we performed real time polymerase chain reaction (PCR) Xpert MTB/RIF and the
81 results showed positive for mycobacterium tuberculosis in both sputum and fistula discharge. We
82 performed an elbow joint puncture , the GenXpert on the fluid joint came back positive.

83 We retained the diagnosis of multifocal tuberculosis with pulmonary, osteoarticular involvement of the
84 left elbow and sacrococcygeal which is rare.

85 Antibacillary chemotherapy was started for 9 months. He was treated with (rifampicin, isoniazid,
86 ethambutol, pyrazinamide) for 2 months followed by (rifampicin, isoniazid) for 7 months according to
87 the recommendations of the national tuberculosis control program in Morocco. There was no for
88 surgical indication. The patients pain resolved and the purulent drainage stopped within the second
89 month of treatment.

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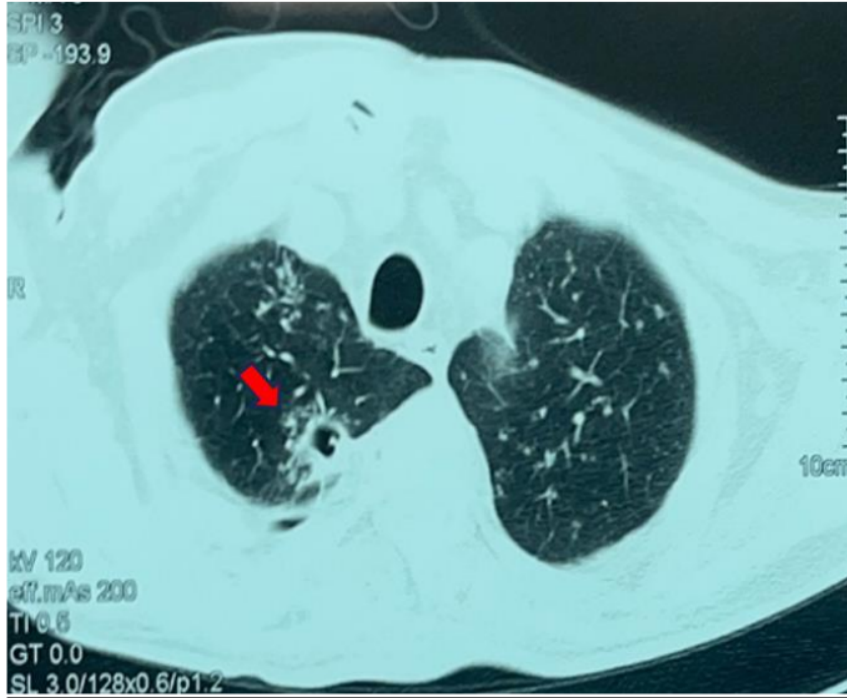


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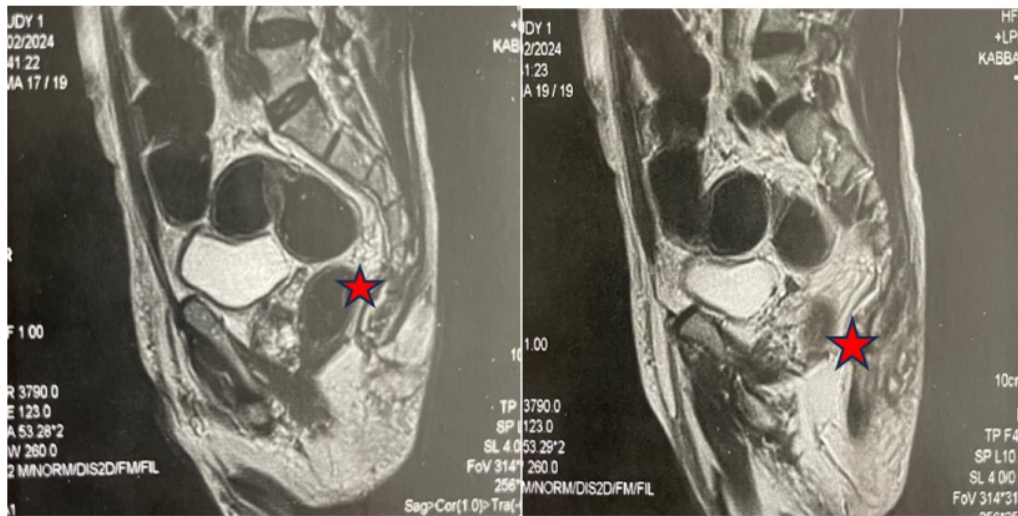
Figure 1: Peri anal fistula (arrow)

94



95

96 **Figure 2:** Chest CT scan shows consolidation with excavation (red arrow) in the right upper lobe



97

98 **Figure 3:** Pelvic MRI shows pericoccygeal collection with soft tissue involvement and fistulous tract
99 (stars)



100

101

Figure 4: Left elbow CT scan shows joint effusion and severe osteopenia

102

103 7. Discussion

104 Tuberculosis remains a global health concern posing significant challenges ¹ to both clinicians and
105 radiologist due to its divers and often non-specific clinical manifestations. Elbow tuberculosis is rare ² ,
106 its incidence varies form 2% to 5% of all skeletal locations (6) On the other hand, tuberculosis infection
107 of the lumbosacral junction is also quite rare, accounting for only 1 to 2% of all spinal tuberculosis
108 cases (5). Multifocal tuberculosis is defined by the occurrence of tuberculosis lesions in multiple
109 locations across different adjacent or distant organs. And it commonly occurs in immunocompromised
110 patients who differs from that in non-immunocompromised individuals in terms of clinical

111 presentations, radiological features, laboratory findings, and treatment approaches, which often leads
112 to misdiagnosis (7).

113 We report a case of a multifocal tuberculosis with atypic and rare localizations including left elbow
114 and sacro coccygeal joint. We were able to confirm our diagnosis at all sites using the GenXpert test
115 on the joint fluid, fistula discharge and sputum samples. Our patient is immunocompetent and have a
116 history of well controlled diabetes.

117 The diagnosis of extra pulmonary tuberculosis can be challenging because of the diverse clinical
118 presentations that mimics other medical conditions. Our patient reported initially the elbow joint pain
119 and the back pain with a peri anal fistula. The clinical manifestations of sacral tuberculosis vary with
120 age. Younger patients typically present with discharging sinuses and abscesses, while adults more
121 commonly experience back pain as the primary symptom. Due to the protection provided by the sacral
122 bone to the nerve roots, neurological symptoms are relatively uncommon(5). Indeed, our patient does
123 not present with any neurological symptoms, and the clinical examination shows no motor deficits or
124 sensory disturbances.

125 Only few cases of coccygeal tuberculosis are reported in literature (table 1) and just three of them
126 present with sinus discharges. Concomitant active pulmonary tuberculosis is observed around 50% of
127 spine TB cases (8) , our patient had active pulmonary tuberculosis as well with positive acid fact bacilli
128 examination of the sputum .

129 Usefulness of the PCR test is worth emphasizing because its less invasiveness and has a high specificity
130 for TB. PCR was significantly more sensitive than histopathology in detecting TB (8) . Most cases of
131 coccygeal tuberculosis have been diagnosed through invasive procedures such as biopsies or surgery,
132 likely due to clinical presentations that often suggest alternative diagnoses, particularly malignancies.
133 In our case, we confirmed the presence of *Mycobacterium tuberculosis* using a rapid and non-invasive
134 technique through PCR testing on various samples.

135

136

137

138 **Table 1: presents documented cases of sacrococcygeal tuberculosis reported in literature**

Authors	country	Age	gender	Presence of peri-anal discharge	Pulmonary involvement	Diagnostic method
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Thilakaranthe et al , 2015	Sri Lanka	47	F	Yes	No	Biopsy under exploration of post anal space
Kim et al, 2012	Korea	35	M	No	No	CT guided biopsy
Singh et al 2011	India	20	F	No	No	Needle biopsy
Osman et al, 2016	Tunisia	55	F	No	No	Surgery
Takakura et al 2018	Japan	93	M	yes	No	Bacterial examination of fistula discharge
Kumar et al, 2006	India	42	F	yes	No	Biopsy
Gadi et al, 2019	India	23	F	No	No	CT guided biopsy

139

140 8. Conclusion

141 Multifocal tuberculosis remains a public health issue. It is rare in immunocompetent individuals, but it
142 can be life-threatening and have serious consequences for the patient's health and well-being.

143

144 9. Author statements

145 9.1 Author contributions

146 S.B : Wrote the first draft of the manuscript and agreed to be responsible for all aspects of the work.
147 A.Z and H.S : supervision, validation, writing, review and editing, while M.B, S.E.F, and A.R :
148 investigations, methodology, resources. I.A.R and H.E.O. provided final approval for the version to be
149 published.

150

151 9.2 Conflicts of interest

152 The authors declare that there are no conflicts of interest.

153

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156 profit sectors.

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158 **9.4** **Consent for publication**

159 Written informed consent was obtained from the patient to publish this report in accordance with the
160 journal's patient consent policy.

161

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