

Spinal Infections

TUBERCULOUS SPONDYLODISCITIS AT THE NEUROSURGERY DEPARTMENT OF DONKA TEACHING HOSPITAL IN CONAKRY: Epidemiological, Clinical, Radiological and Therapeutic Aspects — A 27-Case Series

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ABSTRACT

Introduction: Tuberculous spondylodiscitis (TS), or Pott's disease, is a severe form of extrapulmonary tuberculosis particularly common in sub-Saharan Africa. Responsible for disabling neurological complications, it represents a major diagnostic and therapeutic challenge in resource-limited countries such as Guinea. We report a series of 27 cases managed at the neurosurgery department of Donka Teaching Hospital in Conakry.

Methods: Retrospective descriptive study of 27 patients hospitalized for tuberculous spondylodiscitis at the neurosurgery department of Donka Teaching Hospital. Diagnosis was based on clinical, biological (tuberculin skin test), radiological (standard X-ray $\pm$ CT scan) and histological criteria.

Results: Mean age was 40 years (range: 10–68) with slight male predominance (sex-ratio 1.1). Workers were the most affected occupational group (33.3%). Spinal pain was present in 100% of cases. Neurological deficit was found in 74.1% of patients, dominated by paraplegia (40.7%) and paraparesis (29.6%). Tuberculin skin test was positive in 100% of patients. Lumbar (40.8%) and dorsolumbar (33.3%) levels predominated. Vertebral body lysis was the most common radiological finding (51.8%). Treatment was medico-surgical in 33.3% (decompressive laminectomy or foraminotomy), medico-orthopedic in 44.5% and medical alone in 22.2%. Outcome was favorable in 81.5% of cases. No in-hospital deaths were observed.

Conclusion: Tuberculous spondylodiscitis is a frequent and serious condition in our context. Early diagnosis based on clinical findings and tuberculin skin testing—in the absence of MRI—allows rapid initiation of antituberculous quadritherapy. Decompressive surgery remains essential in cases of significant neurological deficit or unstable vertebral destruction, with good results in our series.

Keywords: Tuberculous spondylodiscitis; Pott's disease; Spinal cord compression; Paraplegia; Antituberculous quadritherapy; Laminectomy; Guinea; Sub-Saharan Africa

1. INTRODUCTION

Tuberculosis (TB) remains one of the world's major infectious diseases, responsible for nearly 10 million new cases and 1.5 million deaths annually according to the 2023 WHO report [1]. In sub-Saharan Africa, its prevalence remains particularly high, exacerbated by the HIV/AIDS co-epidemic and poor socioeconomic conditions. In Guinea, the incidence of tuberculosis is estimated at 175 per 100,000 inhabitants, making this disease a major public health priority [1].

Tuberculous spondylodiscitis (TS), commonly known as Pott's disease, represents spinal involvement by tuberculosis and constitutes the most frequent extrapulmonary form, accounting for 50–60% of osteoarticular localizations [2, 3]. Its pathophysiology is based on hematogenous dissemination of *Mycobacterium tuberculosis* from a primary, often silent, pulmonary focus to the most vascularized part of the vertebral body (anterior portion), followed by secondary extension to the adjacent intervertebral disc through the subligamentous route. The necrotizing granulomatous process progressively causes disco-vertebral destruction, angular kyphotic deformity and, in advanced forms, spinal cord compression due to epidural extension or a so-called “cold” abscess [4, 5].

The severity of TS is related to its neurological complications—paraparesis and paraplegia due to spinal cord compression—which occur in 10–47% of cases according to African series [6, 7] and constitute the main indication for surgery. In sub-Saharan Africa, frequent diagnostic delay—related to lack of awareness of the disease, limited access to advanced imaging (MRI is unavailable in many centers), and initial recourse to traditional healers—considerably worsens the neurological prognosis [6].

In Guinea, no published series has specifically addressed tuberculous spondylodiscitis managed in a neurosurgical setting. This study, involving 27 consecutive patients admitted to the neurosurgery department of Donka Teaching Hospital in Conakry, aimed to describe the epidemiological, clinical, radiological and therapeutic profile of this condition in our setting and to discuss our findings in light of recent African and international data.

2. MATERIALS AND METHODS

2.1 Study setting and design

This was a retrospective descriptive study conducted in the neurosurgery department of CHU Hôpital National Donka in Conakry, the main national neurosurgical referral center in Guinea, which receives patients from across the country.

2.2 Inclusion and exclusion criteria

All patients hospitalized for tuberculous spondylodiscitis diagnosed according to clinical criteria (spinal pain, fever, weight loss, neurological deficit), biological criteria (positive tuberculin skin test, biological inflammatory syndrome), radiological criteria (vertebral lysis, disc-space narrowing, paravertebral abscess on radiography and/or CT scan) and/or histological criteria (epithelioid and giant-cell granulomas with caseous necrosis) were included. Spondylodiscitis of non-tuberculous etiology (pyogenic, brucellar, neoplastic) was excluded.

2.3 Variables studied

Collected data included sociodemographic characteristics (age, sex, occupation), clinical symptoms, paraclinical findings (tuberculin skin test, laboratory data, imaging), treatment type (medical alone, medico-orthopedic, medico-surgical) and outcome at discharge.

3. RESULTS

3.1 Sociodemographic data

Twenty-seven patients were included in this series. The population was predominantly of working age, with a mean age of 40 years (range: 10–68). A slight male predominance was observed, with 14 men (51.9%) and 13 women (48.1%), giving a sex ratio of 1.1. Workers represented the most affected occupational category (33.3%), followed by farmers and unemployed individuals.

Table I. Sociodemographic characteristics (n=27)

Parameter	Number	Percentage (%)
Cohort size	27	100
Male sex	14	51.9
Female sex	13	48.1
Mean age (years)	40 (10–68)	
Occupation: Workers	9	33.3

3.2 Clinical presentation

Spinal pain was the main symptom and was present in 100% of patients. Lower-limb neurological deficit was observed in 74.1% of patients. General symptoms suggestive of tuberculosis included asthenia (37%), weight loss (33.3%) and fever (25.9%).

Table II. Functional and general symptoms (n=27)

Clinical sign	Number	Percentage (%)
Spinal pain	27	100.0
Lower-limb weakness	20	74.1
Asthenia	10	37.0
Weight loss	9	33.3
Fever	7	25.9

Table III. Neurological complications (n=27)

Neurological complication	Number	Percentage (%)
Sensory disturbances	12	44.4
Paraplegia	11	40.7
Genitourinary/sphincter dysfunction	9	33.3
Paraparesis	8	29.6

3.3 Paraclinical findings

The tuberculin skin test was positive in all 27 patients (100%). Standard spinal radiography was performed in all patients. CT was available for only 3 patients (11.1%). Spinal MRI could not be performed in any patient because of financial and availability constraints—a major limitation of our management.

Table IV. Paraclinical examinations performed (n=27)

Paraclinical examination	Number	Percentage (%)
Tuberculin skin test (positive)	27	100.0
Standard spinal radiography	27	100.0
Spinal CT	3	11.1
Spinal MRI	0	0.0

3.4 Lesion locations and radiological findings

Lumbar involvement predominated (40.8%), followed by dorsolumbar involvement (33.3%). Vertebral body lysis was the most frequent lesion (51.8%), followed by intervertebral space narrowing (18.5%).

Table V. Location of spinal lesions (n=27)

Lesion location	Number	Percentage (%)
Lumbar	11	40.8
Dorsolumbar	9	33.3
Thoracic	5	18.5
Cervical	2	7.4

Table VI. Radiological lesions (n=27)

Radiological lesion	Number	Percentage (%)
Vertebral body lysis	14	51.8
Intervertebral space narrowing	5	18.5
Vertebral collapse	5	18.5
Paravertebral abscess (X-ray/CT)	3	11.1

3.5 Treatment

All patients received standardized antituberculous treatment: four-drug therapy (rifampicin + isoniazid + pyrazinamide + ethambutol) for 2 months, followed by two-drug therapy (rifampicin + isoniazid) for a minimum of 4 months, for a total duration of at least 6 months.

Surgical treatment was performed in 9 patients (33.3%): decompressive laminectomy or foraminotomy for spinal cord decompression in response to severe neurological deficits or critical bone destruction. Twelve patients (44.5%) received medico-orthopedic treatment (antituberculous therapy + brace or cervical collar), while 6 patients (22.2%) received medical treatment alone.

Table VII. Treatment modalities (n=27)

Type of management	Number	Percentage (%)
Medico-orthopedic	12	44.5
Medico-surgical	9	33.3
Medical alone	6	22.2
Total	27	100.0

3.6 Outcome

Outcome was favorable (clinical and functional improvement) in 22 patients (81.5%). Persistent sequelae—stable residual neurological deficit—were observed in 2 patients (7.4%). No in-hospital deaths were recorded in our series (0%).

Table VIII. Patient outcomes (n=27)

Clinical outcome	Number	Percentage (%)
Improvement	22	81.5
Persistent sequelae	2	7.4
In-hospital death	0	0.0
Lost to follow-up / not specified	3	11.1

4. DISCUSSION

4.1 Epidemiology

Our series of 27 cases of tuberculous spondylodiscitis managed at Donka Teaching Hospital in Conakry represents, to our knowledge, the first published Guinean series on this topic. The mean age of 40 years and slight male predominance (sex ratio 1.1) are consistent with recent African data. The Ivorian series of 46 patients operated on for Pott's disease (Cocody Teaching Hospital, Abidjan, 2019–2023) reported a mean age of 41.3 ± 15.6 years with 52% women [7]. In Cameroon, Ndoumbe et al. (2022) found a similar profile in their series of 86 cases, with a moderate male predominance [6]. The predominance of workers (33.3%) in our series reflects their greater exposure to tuberculosis risk factors: precarious living conditions, overcrowding and occupational exposure.

Although the diagnostic delay was not precisely quantified in our retrospective series, it appeared prolonged in view of the high frequency of neurological complications at admission (74.1% with deficits). This finding is common throughout sub-Saharan Africa: in Cameroon, the mean time before diagnosis was more than 6 months in the majority of cases [6], while a Tunisian series of 15 cases also highlighted diagnostic difficulties in atypical presentations [8].

4.2 Clinical presentation and neurological complications

Spinal pain, present in 100% of our patients, is the cardinal sign of TS in all published series [2, 3, 6, 7, 8]. Its persistence, progressive worsening and association with general symptoms suggestive of tuberculosis (fever, weight loss, asthenia)—found in 25.9%, 33.3% and 37% of our cases, respectively—should systematically raise suspicion of a tuberculous etiology in an endemic setting.

The high rate of neurological complications in our series (74.1% with lower-limb deficits, including 40.7% complete paraplegia and 29.6% paraparesis) reflects the severity of the admitted cases and

diagnostic delay. These figures are higher than those reported in the Ivorian series (46 operated patients/512 hospitalized cases, or 8.9% surgery) [7], but this can be explained by the specifically neurosurgical recruitment profile of our cohort, which selects the most severe forms. The Cameroonian series reported 19.6% spinal cord compression in its general cohort [6], and the meta-analysis by Rajasekaran et al. (2016) [17] estimated the prevalence of neurological deficits at 40–60% in African neurosurgical series.

The frequency of genitourinary and sphincter disturbances (33.3%) in our series indicates significant spinal cord involvement affecting sacral centers. These symptoms, which are often underestimated and not spontaneously reported by patients, should be systematically assessed during clinical examination because they represent an additional severity criterion and influence long-term functional prognosis.

4.3 Paraclinical findings and diagnostic limitations

The universal positivity of the tuberculin skin test (100%) in our series confirms its practical diagnostic value in a setting of high tuberculosis endemicity. However, the test has important limitations: it may be falsely negative in cases of severe immunosuppression (advanced HIV infection, malnutrition) and cannot distinguish active infection from previous infection or BCG vaccination [3].

The absence of MRI in our series constitutes the main diagnostic limitation and represents a major weakness in our management. Spinal MRI is recognized as the reference examination for diagnosing TS, allowing early visualization of disco-vertebral lesions, epidural extension and spinal cord compression, and helping differentiate TS from other causes of spondylodiscitis or neoplastic disease [9, 13]. Its economic unavailability in our setting requires therapeutic decisions to be based on clinical and radiographic criteria—an approach that remains acceptable in resource-limited countries but exposes patients to diagnostic errors and underestimation of lesion extent. Access to spinal MRI should be a priority for improving neurosurgical management in Guinea.

The limited availability of CT (11.1% of patients) is also concerning. GeneXpert MTB/RIF, whose availability is progressively increasing in Guinea, represents a valuable tool for rapid microbiological confirmation and detection of rifampicin resistance [12].

4.4 Lesion location

The predominance of lumbar (40.8%) and dorsolumbar (33.3%) involvement in our series is consistent with international literature, which reports a predominance of thoracic and thoracolumbar involvement in Asian series, but a more marked lumbar predominance in African series [2, 3, 6, 7]. This difference in anatomical distribution between populations could be related to differences in the portal of entry of the organism and patterns of hematogenous dissemination. Cervical involvement (7.4% in our series) is rare and potentially more serious because of the risk of cervical spinal cord compression with tetraplegia [4].

Vertebral body lysis (51.8%) and intervertebral space narrowing (18.5%) were the predominant radiological lesions. These two classic features of Pott's disease reflect the centrifugal progression of infection—from the more vascularized vertebral body to the adjacent disc—which is characteristic of spinal tuberculosis in contrast to pyogenic spondylodiscitis, which preferentially begins at the disc level [3].

4.5 Treatment

Standardized antituberculous four-drug therapy constituted the foundation of management for all our patients. The 6-month duration used in our series is consistent with WHO recommendations [1]. Some authors nevertheless recommend a longer duration (9–12 months) in severe forms with extensive vertebral destruction or immunosuppression [2, 3]. In our setting, the optimal duration remains difficult to assess because of the lack of systematic long-term follow-up.

Surgical treatment (33.3% of our patients)—decompressive laminectomy or foraminotomy—was indicated in cases of severe neurological deficits and critical bone destruction. This rate is comparable to data from the African neurosurgical literature: 33% in the Cameroonian series [6] and 8.9% in the Ivorian series, which included all hospitalized cases rather than only neurosurgical cases [7]. Surgery in TS aims to decompress neurological structures compressed by an epidural abscess or bone fragments, debride necrotic tissue, stabilize the spine, and obtain a specimen for histological and microbiological confirmation [4, 15, 16].

Antituberculous four-drug therapy should be initiated before surgery when the diagnosis has been established and continued postoperatively for a minimum of 6 months. Adjunctive corticosteroid therapy, used by some teams to reduce perioperative spinal cord edema in cases of severe compression, was not systematically used in our series.

4.6 Outcome and prognosis

Favorable outcome in 81.5% of our patients—with clinical and functional improvement—is encouraging, particularly given the neurological severity at admission. This rate is comparable to African literature: the Cameroonian series reported neurological improvement in 75% of operated cases [6], while Rajasekaran et al. (2016) found neurological recovery in 75–85% of surgically treated incomplete forms [17].

The absence of in-hospital deaths (0%) in our series is notable and reflects the relative safety of decompressive surgical management in an experienced team despite resource limitations. However, this finding should be interpreted cautiously because long-term mortality and neurological sequelae could not be assessed—both are crucial for a complete prognostic evaluation.

Persistent neurological sequelae in 7.4% of patients underscore the importance of early intervention before the establishment of irreversible complete paraplegia. The main prognostic factor for neurological recovery remains the duration and severity of the preoperative deficit: complete paraplegia lasting more than 6 months has a very limited probability of recovery, even after adequate surgical decompression [4, 17].

5. CONCLUSION

Tuberculous spondylodiscitis is a frequent and serious condition in the neurosurgery department of Donka Teaching Hospital in Conakry, predominantly affecting active adults of middle age, with a slight male predominance. Constant spinal pain, associated with severe neurological complications in 74% of patients—a reflection of prolonged diagnostic delay—warrants increased clinical vigilance in a tuberculosis-endemic setting.

The universal positivity of the tuberculin skin test confirms its practical diagnostic value in the absence of MRI. Treatment is based on standardized four-drug antituberculous therapy, associated with spinal cord decompressive surgery in one third of cases. The good outcomes observed (81.5% improvement and no in-hospital deaths) support this therapeutic strategy in our setting.

Improving the prognosis of TS in Guinea requires strengthening access to spinal MRI for early diagnosis, developing rapid microbiological confirmation techniques (GeneXpert), and raising awareness among first-line physicians to systematically consider Pott's disease in any patient with chronic spinal pain in our endemic setting. Prospective multicenter studies at the national level are needed to establish epidemiological data representative of the Guinean population.

DECLARATIONS

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Authors' contributions: Komara CA — study conception, principal surgeon, manuscript drafting; Mansaré L, Diallo B, Diallo AR, Bah D — data collection, clinical management; Beavogui LK — supervision, critical revision.

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