World Journal of Pulmonary and Respiratory Medicine

Research Article

# Drug-Resistant Extrapulmonary Tuberculosis: Experience with 17 Cases in Treatment Centers in Conakry

*Camara A[1,2,3*], Camara A[1,2], Sylla ML[1,2], Diallo MY[1,2], Camara ON[2], Camara S[2,3], Touré D[1,2], Diallo BD[1,2,3], Camara LM[1,2,3], Bangoura AM[2] and Magassouba AS[1,3]*

[1]Faculty of Health Sciences and Techniques, Gamal Abdel Nasser University of Conakry, Guinea

[2]Department of Pulmonology, Ignace Deen National Hospital, Guinea

[3]National Tuberculosis Control Program, Guinea

## Abstract

**Introduction:** Drug-resistant extrapulmonary tuberculosis is rarely described in Guinea. The objectives were to describe the patient characteristics, management challenges, and outcomes of patients treated for multidrug-resistant extrapulmonary tuberculosis in Conakry.

**Methodology:** This was a four-year retrospective, descriptive study conducted at MDR-TB treatment sites in Conakry (Ignace, Tombolia, and CATR de la Carrière) from January 1, 2018, to December 31, 2021. We included the records of patients with multidrug-resistant extrapulmonary tuberculosis, either isolated or associated with pulmonary tuberculosis.

**Results:** A total of 17 cases met the eligibility criteria, representing a frequency of 2.78%. The mean age was 37 ± 20.55 years, ranging from 14 to 83 years. A male predominance was observed, with a sex ratio of 1.42 men to one woman. There were 13 cases (76.50%) of combined pulmonary and extrapulmonary MDR-TB, compared to 4 cases (23.50%) of isolated extrapulmonary disease. The sites of infection included pleural (7 cases; 41.17%), bone (3; 17.64%), lymph node (2; 11.76%), breast (1; 5.88%), cutaneous (1; 5.88%), peritoneal (1; 5.88%), urogenital (1; 5.88%), and cerebral (1; 5.88%). The predominant symptoms were fever, weight loss, and physical asthenia, present in 88.23%, 82.35%, and 88.23% of cases, respectively. Undernutrition was the comorbidity identified at the start of treatment (64.70%). All patients received a long-course anti-tuberculosis regimen lasting 18 to 24 months. The treatment success rate was 33%, and the mortality rate was 47.05%.

**Conclusion:** Multidrug-resistant extrapulmonary tuberculosis is a very rare presentation due to the low bacillary load. The clinical course is marked by a high mortality rate despite a standardized antituberculosis treatment regimen.

**Keywords: Extrapulmonary tuberculosis; Multidrug resistance; Treatment center; Conakry**

## Introduction

The emergence of drug-resistant Tuberculosis (TB) is compromising global TB control efforts. Multidrug-Resistant (MDR) strains-defined as those resistant to isoniazid and rifampicin-emerged in the 1990s. Among these strains, 6% have developed additional resistance mechanisms against key second-line anti-TB drugs, namely fluoroquinolones and aminoglycosides; these strains are classified as Extensively Drug-Resistant (XDR) [1]. According to a 2020 WHO report, 465,000 new cases of rifampicin-resistant or multidrug-resistant TB (RR/MDR-TB) were diagnosed in 2019; of these, 78% were MDR-TB and 8.5% were XDR-TB, with a global multidrug-resistance incidence of 3.3% among new cases and 18% among previously treated cases [2]. Extrapulmonary Tuberculosis (EPTB) can occur in isolation or in conjunction with pulmonary disease [3]. In France, EPTB cases account for approximately 25% to 27% of the total [4]. In Africa, Maghreb countries report the highest global rates of EPTB, ranging from 45% to 60% [1]. Renewed interest in these extrapulmonary forms of TB has emerged due to the complexity of diagnosing them and the relative increase in recorded cases in recent years [5]. Diagnosing extrapulmonary tuberculosis is not always straightforward [6]. Diagnosis must be based on direct samples obtained via puncture or biopsy and subjected to microbiological and histological examination. Culture is essential for guiding treatment and performing drug susceptibility testing, given the growing global prevalence of resistance to anti-tuberculosis drugs [6].

The clinical course of treated multidrug-resistant tuberculosis is less favorable than that of drug-susceptible tuberculosis and depends largely on the duration of treatment and the quality of follow-up and patient management [7]. Estimates for Africa indicate approximately 69,000 cases of MDR-TB, the vast majority of which likely go undetected due to insufficient laboratory capacity to implement *M. tuberculosis* culture techniques and antibiotic susceptibility testing, as well as limited access to second-line drugs [7]. In Morocco, 30,651 tuberculosis cases (all forms combined) were recorded in 2017;

**Citation:** Camara A, Camara A, Sylla ML, Diallo MY, Camara ON, Camara S, et al. Drug-Resistant Extrapulmonary Tuberculosis: Experience with 17 Cases in Treatment Centers in Conakry. W J Pulm Respir Med. 2026; 1(1): 1001.

**Copyright:** © 2026 Camara A

**Publisher Name**: Medtext Publications LLC

**Manuscript compiled:** Oct 05th, 2026

***Corresponding author:** Camara A, Faculty of Health Sciences and Techniques, Gamal Abdel Nasser University of Conakry, Guinea, Tel: (+224) 620 62 23 01

extrapulmonary tuberculosis accounted for 48% of cases, and 236 MDR-TB and 13 XDR-TB cases were laboratory-confirmed [1]. In Guinea, the WHO estimated the proportion of MDR/RR-TB cases in 2021 to be 2.3% among new TB cases and 17% among previously treated TB cases.

The number of incident RR-TB cases is estimated at 660 (range: 0-1,700), corresponding to a rate of 4.9 (range: 0-13) per 100,000 inhabitants. The number of confirmed and treated cases rose from 155 in 2016 to 376 in 2021, showing a steady upward trend despite the COVID-19 pandemic. Diagnosing isolated extrapulmonary forms via quality laboratory testing is challenging, which complicates screening for these types of the disease; consequently, the majority of cases among People Living with HIV (PLHIV) are diagnosed clinically, given the limited diagnostic utility of available methods for extrapulmonary forms. Culture testing is performed in only two of the country's eight regions [8]. Regarding treatment outcomes for drug-resistant tuberculosis, the success rate was 75.3% in 2020 and 74% for the 2021 cohort. The primary reasons for treatment failure in the 2021 cohort were death (17%)-likely due to late case detection-loss to follow-up (7%), and treatment failure (3%) [9]. Multidrug resistance is undoubtedly the new challenge in the fight against tuberculosis. For many years, Guinea's National Tuberculosis Control Program (PNLAT) has implemented the use of anti-tuberculosis drugs for multidrug-resistant bacilli. These so-called "second-line" drugs require a longer treatment duration and are associated with numerous side effects. After four years of patient management, we report on the experience of the three MDR-TB sites in the city of Conakry. The objectives of this study were to describe Patient characteristics, management challenges, and outcomes of patients treated for multidrug-resistant extrapulmonary tuberculosis.

## Methodology

This was a retrospective, descriptive study spanning four years-from January 1, 2018, to December 31, 2021-conducted at three MDR-TB treatment sites in Conakry (Ignace, Tombolia, and the Carrière CATR). The study focused on the medical records of patients hospitalized and monitored for multidrug-resistant tuberculosis (MDR-TB), whether isolated or associated with pulmonary TB. We conducted a review of various data sources regarding MDR-TB diagnosis and treatment, collecting sociodemographic, clinical, paraclinical, therapeutic, and outcome-related data. Diagnostic tests to determine the etiology were systematically performed; these included chest X-rays, sputum testing for Acid-Fast Bacilli (AFB) using Ziehl-Neelsen staining, sputum PCR (Xpert MTB/RIF), and HIV serology. The diagnosis of MDR-TB was established based on a positive GeneXpert MTB/RIF result indicating resistance in collected samples (sputum, urine, cerebrospinal fluid, pleural pus, or lymph node aspirates) and was confirmed by Line Probe Assays (LPA), Drug Susceptibility Testing (DST), and culture with susceptibility testing. The diagnosis of Extrapulmonary Tuberculosis (EPTB) was based on either direct diagnostic confirmation (from a sample taken at the site) or indirect confirmation (confirmation from an associated site of infection). A comprehensive review was conducted of all records for multidrug-resistant tuberculosis patients who had at least one extrapulmonary site of infection and had been enrolled in an MDR-TB treatment regimen. Data sources included survey forms, medical records, follow-up registers, and electronic databases for MDR-TB patients at the treatment centers. Data were entered using KoboCollect and analyzed using SPSS software (version 21.0). Cases were described in terms of time, place, and person. Results were presented in tables and figures as counts (n) and proportions (%).

### Operational definitions: History of tuberculosis (Registration groups)

Category 1 (Cat1) treatment: patients previously treated for the first time (new cases) with the first-line regimen (2RHZE/4RH); Category 2 (Cat2) treatment: patients previously treated for relapse, treatment failure, or loss to follow-up with the retreatment regimen (2RHZES/1RHE/5RH); Relapse 1 (R1): first relapse of drug-susceptible tuberculosis; Relapse 2: second relapse of drug-susceptible tuberculosis; First-line diagnostic tests: Xpert MTB/RIF: recommended initial molecular test, enabling tuberculosis diagnosis within two hours and testing of strain susceptibility to rifampicin; it allows for the diagnosis of rifampicin-resistant TB (RR-TB); First- and second-line susceptibility tests: Line Probe Assays (LPA): molecular test recommended for all RR cases detected at first-line treatment centers prior to the initiation of second-line treatment (MDR-TB). It enabled the testing of all first- and second-line drugs within 72 hours, thereby allowing for the diagnosis of MDR-TB, RR-TB, and isoniazid-monoresistant TB cases. DST (Drug Susceptibility Testing): This refers to the drug susceptibility testing performed following positive cultures on solid and liquid media during second-line treatment monitoring. It allowed for the testing of all first- and second-line drugs and the confirmation of MDR-TB, RR-TB, and isoniazid-monoresistant TB cases. Smear and culture: These were follow-up bacteriological tests used to assess patients' bacteriological response during treatment and to evaluate patients at the end of treatment. These tests were performed over the course of nine (9) months (M0, M1, M2... M5... M9). Drugs and regimens used: Bedaquiline 100 mg (Bdq); Moxifloxacin 500 mg (Mfx); Linezolid 600 mg (Lzd); Isoniazid 300 mg (H); Prothionamide 250 mg (Pto); Clofazimine 100 mg (Cfz); Pyrazinamide 400 mg (Z); Ethambutol 400 mg (E). Short injectable regimen (9–13 months): (6) Am-H-Mfx-Pto-Cfz-E-Z/5 Mfx-Cfz-E-Z: Applied to all patients with isolated or combined bone and meningeal forms of the disease. Short all-oral regimen (9–13 months): (6) Bdq-4Hh-Mfx-Pto-Cfz-E-Z/5Mfx-Cfz-E-Z: Applied to all patients with isolated or concurrent bone and meningeal forms. Long regimen (18-24 months): 6Lfx-Bdq-Lzd-Cs-Cfz/14 Lfx-Cs-Cfz: Applied to all patients with isolated or concurrent pulmonary forms-excluding bone and meningeal forms in accordance with the treatment protocol.

## Results

During the study period, 17 cases of multidrug-resistant Extrapulmonary Tuberculosis (EPTB) were included. The cohort consisted of ten men and seven women with a mean age of 37 ± 20.55 years (range: 14-83 years). The most affected occupational group was pupils/students (5 cases; 29.4%), followed by manual workers (4; 23.5%), civil servants (4; 23.5%), housewives (3; 17.6%), and a merchant (1; 6%). The majority of patients resided in Conakry (15 cases; 88.2%), while two (11.8%) lived outside the capital. Regarding registration groups, new cases accounted for the largest proportion (13; 76%), followed by first-line treatment failure (2; 12%), Category 1 relapse (R1) (6%), and Category 2 relapse (R2) (6%). Clinical manifestations varied, with the most common being chest pain (70.58%), dyspnea (64.70%), chronic cough (64.70%), fever (88.23%), and weight loss (82.35%). Table 1 illustrates the clinical signs observed in patients with multidrug-resistant extrapulmonary tuberculosis.

Radiological lung findings showed 6 cases (35.30%) of isolated

© 2026 - Medtext Publications. All Rights Reserved.

**Table 1:** Distribution of patients according to clinical signs of multi-resistant PE at admission.

| Signes cliniques | Effectif | Pourcentage (%) |
|---|---|---|
| **Signes fonctionnels respiratoires** | | |
| Toux Chronique | 11 | 64,70 |
| Expectoration | 9 | 52,94 |
| Dyspnée | 11 | 64,70 |
| Douleur thoracique | 12 | 70,58 |
| Hémoptysie | 1 | 5,88 |
| **Signes généraux** | | |
| Fièvre | 15 | 88,23 |
| Amaigrissement | 14 | 82.35 |
| Anorexie | 11 | 64,70 |
| Asthénie physique | 15 | 88,23 |
| **Signes extra respiratoires** | | |
| Troubles de la conscience | 1 | 5,88 |
| Douleur abdominale | 1 | 5,88 |
| Lombalgie | 4 | 23,52 |

nodules, 4 cases (23.50%) of nodular lesions associated with pleural effusion, 1 case (5.90%) of a cavitary lesion associated with pleural effusion, 5 cases (29.40%) of cavities associated with infiltrates, and 1 case (5.90%) of isolated pleural effusion. HIV serology was negative in all patients (100%). The GeneXpert MTB/RIF test confirmed 13 cases (76.47%) of rifampicin resistance and 4 cases (23.53%) with indeterminate results. Second-line susceptibility testing using Line Probe Assays (LPA) and Drug Susceptibility Testing (DST) on all patients confirmed 15 cases (88.24%) of MDR-TB and 2 cases (11.76%) of RR-TB. The types of samples analyzed were: 12 sputum samples (70.59%), 1 pleural fluid sample (5.88%), 1 peritoneal fluid sample (5.88%), 1 urine sample (5.88%), 1 cerebrospinal fluid sample (5.88%), and 1 lymph node pus sample (5.88%). Regarding the localization of the multidrug-resistant TB, associated extrapulmonary forms were the most frequent, accounting for 13 cases (76.47%). Among these, there were 6 cases (35.29%) of combined pulmonary and pleural involvement, 3 (17.64%) pulmonary and bone, 2 (11.76%) pulmonary and lymph node, 1 (5.88%) pulmonary and urogenital, and 1 (5.88%) cerebral and pulmonary. Regarding isolated extrapulmonary forms (4 cases, 23.53%), there was 1 (5.88%) case of cold cutaneous abscess, 1 (5.88%) breast abscess, 1 (5.88%) isolated pleurisy, and 1 (5.88%) peritoneal case (Table 2).

**Table 2:** Distribution of patients according to the sites of multidrug-resistant tuberculosis.

| Localisations | Effectif | Pourcentage (%) |
|---|---|---|
| **Forme extra pulmonaire associée** | **N (13)** | 76,47 |
| Ganglionnaire + Pulmonaire | 2 | 11,76 |
| Pleurale + Pulmonaire | 6 | 35,29 |
| Osseuse (Mal de Pott) +Pulmonaire | 3 | 17,64 |
| Urogénitale + Pulmonaire | 1 | 5,88 |
| Cérébrale + Pulmonaire | 1 | 5,88 |
| **Forme extra pulmonaire isolée** | **N (4)** | 23,53 |
| Cutanée (Abcès froid) | 1 | 5,88 |
| Mammaire | 1 | 5,88 |
| Péritonéale | 1 | 5,88 |
| Pleurale isolée | 1 | 5,88 |

Undernutrition was the comorbidity identified at the start of treatment in 11 cases (64.70%), *vs.* 6 (35.30%) who were not undernourished. Regarding treatment, 10 patients (58.82%) received the short injectable regimen (4 Am-Pto-Hh-Cfz-Mfx-E-Z/5 Mfx-Cfz-E-Z), 3 patients (17.68%) the short oral regimen (4–6 Bdq-Pto-Hh-Cfz-Mfx-E-Z / 5 Mfx-Cfz-E-Z), and 4 (23.53%) the long oral regimen (6 Lfx-Bdq-Lzd-Cs-Cfz / 14 Lfx-Cs-Cfz) in accordance with WHO recommendations (Standard Regimen). Pleural puncture and chest drainage were performed in 4 cases (23.53%) and 3 cases (17.67%), respectively. Corticosteroid therapy was administered to 5 patients (29.41%) (Table 3).

At the beginning and end of treatment, 13 patients (76.47%) had undergone follow-up cultures, compared to 4 (23.53%). Among these, cultures performed during follow-up showed 12 positive cases (92.30%) and 1 negative case (7.70%) at month 0 (M0). At the end of the intensive phase (M4), 9 cases (69.20%) were negative, 1 (7.70%) was positive, and 3 (23.10%) were contaminated. During the maintenance phase and up to the end of treatment, the cultures remained negative for all 13 patients (100%) (Table 4).

**Table 3:** Distribution of patients according to prescribed treatments at care sites.

| Traitement | Effectif | Pourcentage (%) |
|---|---|---|
| **Traitement médical** | **17** | **100** |
| Schéma court injectable (4 Am -Pto-Hh-Cfz-Mfx-E-Z / 5 Mfx-Cfz-E-Z) | 10 | 58,82 |
| Schéma court oral (4-6 Bdq-Pto-Hh-Cfz-Mfx-E-Z/ 5 Mfx-Cfz-E-Z) | 3 | 17,68 |
| Schéma long Oral (6Lfx-Bdq-Lzd-Cs-Cfz/14Lfx-Cs-Cfz) | 4 | 23,53 |
| **Traitement Chirurgical associé** | **7** | **41,20** |
| Drainage pleural | 3 | 42,86 |
| Ponction pleurale | 4 | 57,14 |
| **Traitement symptomatique** | | |
| Antalgique | 10 | 58,82 |
| Corticoïdes | 5 | 29,41 |

Am: Amikacine; Pto: Prothionamide; Hh: Isoniazide forte dose; Cfz: Clofazimine; Mfx: Moxifloxacine; E: Ethambutol; Z: Pyrazinamide; Bdq: Bedaquiline

**Table 4:** Distribution of patients according to culture check results and month.

| Contrôle de culture / Mois | Effectif | Pourcentage (%) |
|---|---|---|
| **Culture à M0** | **13** | **100** |
| Négative | 1 | 7,70 |
| Positive | 12 | 92,30 |
| **Culture à M4** | **13** | **100** |
| Positive | 1 | 7,70 |
| Négative | 9 | 69,20 |
| Contaminée | 3 | 23,10 |
| **Culture à M5** | **13** | **100** |
| Positive | 0 | 0 |
| Négative | 12 | 92,30 |
| Contaminée | 1 | 7,70 |
| **Culture à M9** | **13** | **100** |
| Positive | 0 | 0 |
| Négative | 13 | 100 |

During treatment, certain adverse effects were observed with second-line drugs. These included physical asthenia (13 cases; 76.47%), vomiting (11 cases; 64.70%), osteoarticular pain (8 cases; 47.06%), epigastric pain (7 cases; 41.18%), pruritus (5 cases; 29.41%), and skin darkening (2 cases; 11.76%). These side effects were of moderate severity (Grade 2 or 1) (Table 5).

Regarding the clinical outcome, the study recorded 6 cases (35%) of recovery, 2 cases (12%) of completed treatment, 1 case (6%) of treatment failure, and 8 deaths (47%).

## Discussion

During the study period, we identified 17 cases of extrapulmonary

© 2026 - Medtext Publications. All Rights Reserved.

**Table 5:** Distribution of patients according to the side effects of second-line medications and their severity during treatment.

| Side effects | Grade | Number | Percentage (%) |
|---|---|---|---|
| Vomiting | D2 | 11 | 64,70 |
| Epigastric pain | D2 | 7 | 41,18 |
| Musculoskeletal pain | D1 | 8 | 47,06 |
| Skin darkening | D1 | 2 | 11,76 |
| pruritus | D2 | 5 | 29,41 |
| Physical asthenia | D1 | 13 | 76,47 |

Multidrug-Resistant Tuberculosis (MDR-TB), representing 3% of the total. This frequency is significantly higher than that reported by Azon Kouanou et al. at the Department of Internal Medicine and Medical Oncology at CNHU-HKM-Cotonou (Benin, 2016), which recorded only one case of extrapulmonary MDR-TB [10]. It is also higher than the figure reported in Morocco in 2019 by Hanane Haddaoui et al., who identified 7 cases (1%) of extrapulmonary MDR-TB among patients hospitalized at Moulay Youssef Hospital in Rabat [1]. The low frequency of extrapulmonary MDR-TB cases observed in our series aligns with existing literature, which attributes this trend to two main factors: the diagnostic challenges associated with detecting drug-resistant strains of *Mycobacterium tuberculosis* and the complexity of diagnosing extrapulmonary forms of the disease. Diagnosis of extrapulmonary tuberculosis remains delayed due to late patient presentation and the difficulty of obtaining histological or bacteriological confirmation. The presence of concurrent pulmonary tuberculosis can provide valuable diagnostic clues when other definitive evidence is lacking [11]. Men were more affected than women in our series; the sex ratio was 1.42 men to one woman. More than half of our patients (76.47%) were aged between 14 and 39; however, all age groups were affected, reflecting the contagious nature of the disease. The age extremes of 14 and 83 years were the most affected by extrapulmonary tuberculosis. This finding corroborates the results of a 2020 study in Morocco by Achrane J, Benataya H, et al. [12] who reported a mean age of 38.8 years (range: 15-75 years) and a male predominance. Conversely, different results were reported by M. Zerraa et al. [13] in their 2020 study, which found a mean age of 33 years, and by A. Ben Mansour et al. [11] who reported a mean age of 41 years (range: 13-86 years) and a sex ratio of 0.9.

The age extremes observed are linked to immature immune function in children and immunosenescence in the elderly. This renders these individuals susceptible to developing atypical clinical presentations of tuberculosis, predominantly in the form of extrapulmonary disease. Regarding treatment history, Multidrug-Resistant Tuberculosis (MDR-TB) occurs overwhelmingly in patients previously exposed to anti-tuberculosis drugs-most often due to non-adherence during the course of chemotherapy. In our study, the proportion of MDR-TB was high among new patients (13 cases, 76.47%) and lower among previously treated patients (4 cases, 23.52%). This contrasts with data from the literature, which typically report a higher proportion among previously treated patients. It is essentially a human-induced problem resulting from inadequate or poorly administered treatment. It can also occur in patients with no history of anti-tuberculosis treatment following infection by an individual harboring resistant bacillus [1]. It is important to regularly monitor, encourage, and motivate patients undergoing treatment to ensure adherence and recovery. Directly Observed Treatment (DOT), patient support and education, family information, and the prompt, effective management of adverse drug reactions are key elements for successful treatment [14,15]. The sites of infection observed in our series including pleural, lymph node, bone, meningeal, peritoneal, breast, cutaneous, and urogenital involvement, as well as multifocal disease are comparable to those reported by Haddaoui, et al. [1] specifically, two (2) cases of exclusively extrapulmonary resistant tuberculosis (lymph node and osteoarticular) and five (5) cases involving pulmonary disease combined with other extrapulmonary sites (pleural, lymph node, anal, and neuromeningeal).

Furthermore, our results align with those of Zerraa, et al. [13], showing pulmonary tuberculosis associated with pleural involvement in 39.2% of cases, mediastinal lymphadenopathy in 24%, peritoneal involvement in 19.4%, peripheral lymphadenopathy in 16.4%, splenic involvement in 14.8%, chest wall cold abscess in 12%, urogenital involvement in 10.4%, pericardial and cerebromeningeal involvement in 8.9% each, and osteoarticular involvement in 7.4%. These cases illustrate the challenges of anti-tuberculosis drug resistance and highlight the role of genotypic testing in diagnosing extrapulmonary tuberculosis. Clinical manifestations were dominated by cough accompanied by constitutional symptoms (general health deterioration) and signs pointing to the affected organ. Our results are comparable to those reported by Ben Mansour A et al. [10] in a 2016 study of 105 cases at Abderahmen Mami Hospital in Ariana, Tunisia, where 55 patients (52.38%) presented with general symptoms. Comorbidities were identified in 7 cases (41%) in our series; notably, 11 patients (64.70%) were malnourished, with a BMI <18.5 at the start of anti-tuberculosis treatment. This finding highlights the complexity of managing multidrug-resistant tuberculosis patients when comorbidities are present. Similar results were observed by H. Snène et al., who reported 4 cases with comorbidities in Tunisia [16]. Mjid M, et al. [17] in their study conducted in Tunisia in 2018, found a 50% prevalence of malnutrition.

Our findings corroborate data from the literature indicating that the majority of tuberculosis patients develop malnutrition. The association of MDR-TB with comorbidities hinders the achievement of the goal to increase treatment success rates for MDR-TB. Parenchymal lesions were present in 13 cases (76.47%). Cavitary lesions predominated among parenchymal findings, accounting for 50% of cases. These cavitary lesions harbor bacillary populations that are difficult to reach and are associated with the sequential mutations leading to multidrug resistance. However, all our patients received standard treatment using a 24-month short regimen, comprising either injectable-based (short injectable regimen) or all-oral (short oral regimen) options. The treatment regimen used in our series aligns with the new WHO recommendations for treating MDR/RR-TB. The overall goal of anti-tuberculosis treatment is to achieve cure without relapse in all. patients, by interrupting the transmission of *Mycobacterium tuberculosis* and preventing the acquisition (or amplification) of additional drug resistance. Therefore, it is important to regularly monitor, encourage, and motivate patients to ensure treatment adherence and cure. Directly Observed Therapy (DOT), patient support and education, family information, and the prompt, effective management of adverse drug reactions are key elements for successful treatment [14,15]. The various side effects observed during treatment in our series included gastrointestinal disorders (64.70%), neurological disorders (47.05%), auditory disorders (35.29%), musculoskeletal disorders (23.52%), and hematological disorders (11.76%). Our results are similar to those reported by Zhang, et al. [18], involving musculoskeletal (67.5%), gastrointestinal (65.4%), and dermatological (17.4%) issues, as well as ototoxicity (5.9%). Patient

© 2026 - Medtext Publications. All Rights Reserved.

outcomes show a very low cure rate, specifically 35%. This proportion aligns with the overall treatment success rate for MDR-TB patients, which is below 80%. This result is lower than that reported by Ben Mansour et al., who observed a favorable treatment outcome in 68.9% of cases [11].

The observed mortality rate was approximately 50%, specifically 8 deaths (46.10%), alongside one case of treatment failure (5.88%). This mortality rate is higher than that reported. who recorded two deaths-one involving respiratory distress secondary to a pneumothorax complicating miliary tuberculosis, and the other resulting from multi-organ failure secondary to Disseminated Intravascular Coagulation (DIC)-with 19 patients lost to follow-up [23]. The high mortality rate in our series could be attributed to the presence of comorbidities-which carry a poor prognosis if not managed promptly-and the extent of pulmonary lesions, which can lead to respiratory failure. These factors are known predictors of poor treatment outcomes in tuberculosis. The clinical course of treated multidrug-resistant tuberculosis is less favorable than that of drug-susceptible tuberculosis. Cure rates range from 60% to 75% for MDR-TB, dropping to 30%-40% for Extensively Drug-Resistant (XDR) tuberculosis. Mortality remains high, ranging from 20% to 40%, and can reach 70%-90% in patients co-infected with HIV [7].

## References


1. Haddaoui H, Mrabet FZ, Aharmim M, Bourkadi JE. Multi resistant extrapulmonary tuberculosis: about 7 CAS. Pan Afr Med J. 2019;32:196.
2. World Health Organization. Consolidated guidelines on tuberculosis: module 5: management of tuberculosis in children and adolescents. WHO. 2022.
3. Kommbila UD, Mounguengui D, Ibinga LD, Boulingui CM, N'gomanda F, Boguikouma JB. Extra pulmonary tuberculosis versus pulmonary tuberculosis: epidemiological, and evolutionary aspects in an outpatient tuberculosis care center in Gabon. J Func Vent Pulm 2021;38(12):1-78.
4. Mazza-Stalder J, Nicod L, Janssens JP. Extra pulmonary tuberculosis. Rev Mal Resp. 2012;29(4):566-78.
5. Diallo AB, Kollo AI, Camara M, Lo S, Ossoga GW, Mbow M, et al. Performance of the GeneXpert MTB/RIF® in the diagnosis of extra-pulmonary tuberculosis in Dakar: 2010-2015. Pan Afr Med J. 2016;25:129.
6. Marti F, Bregenzer T. Les manifestations extra-pulmonaires de la tuberculose. Forum Med Suisse. 2010;10(15):266-270.
7. Daley CL, Caminero JA. Management of multidrug-resistant tuberculosis. Semin Respir Crit Care Med. 2018;39(3):310-24.
8. Republic of Guinea, Technical Guide for the Management of Drug-Resistant Tuberculosis, 4th Ed. 2021;82:11-12.
9. Republic of Guinea, Ministry of Health and Public Hygiene. National Tuberculosis Control Program: 2022 Annual Report on Tuberculosis Control Activities in Guinea. 2022;18-20.
10. Azon-Kouanou A, Gbéssi DG, Agbodande KA, Prudencio RD, Adè S, Sèhonou J, et al. Lymph node and anal tuberculosis caused by *Mycobacterium tuberculosis* with primary rifampicin resistance: a case report. RAFMI. 2016;3(1):65-70.
11. Ben Mansour A, Ben Saad S, Daghfous H, Ben Khlifa M, Tritar F. Difficultés de la prise en charge de la tuberculose extrapulmonaire. Rev Mal Resp.2016;33:A238.
12. Achrane J, Benataya H, Bourkadi J, Benamor J, Marc K. Profil épidémiologique, clinique, thérapeutique et évolutif des patients atteints de tuberculose pulmonaire et extrapulmonaire résistante: à propos de 147 cas. Rev Mal Resp. 2020;12(1):162-3.
13. Zerraa M, Zaghba N, Benjelloun H, Yassine N. Tuberculose multifocale chez l'immunocompétent : une série de 71 cas. Rev Mal Resp. 2020;12(1):162.
14. Khan S, Andries A, Pherwani A, Saranchuk P, Isaakidis P. Patch-testing for the management of hypersensitivity reactions to second-line anti-tuberculosis drugs: a case report. BMC Res Notes. 2014;7(1):537.
15. Falzon D, Jaramillo E, Schunemann HJ, Arentz M, Bauer M, Bayona J, et al. WHO guidelines for the programmatic management of drug-resistant tuberculosis: 2011 update. Eur Resp J. 2011;38(3):516-28.
16. Snène H, Daghfous H, Saad SB, Khalifa MB, Zarrouk M, Slim L, et al. La tuberculose multi-résistante: état des lieux en Tunisie. Rev Mal Resp. 2015;32:A234.
17. Mjid M, Taboubi A, Hedhli A, Loued L, Cheikhrouhou S, Mbarek N, et al. Évaluation de la malnutrition chez les adultes tunisiens atteints de tuberculose: l'indice de masse corporelle peut-il être remplacé par la mesure du périmètre brachial? Rev Mal Resp. 2018;35:A171.
18. Zhang Y, Wu S, Xia Y, Wang N, Zhou L, Wang J, et al. Adverse Events Associated with Treatment of Multidrug-Resistant Tuberculosis in China: An Ambispective Cohort Study. Med Sci Monit. 2017;23:2348-56.


© 2026 - Medtext Publications. All Rights Reserved.