



TUBERCULOUS COLD ABSCESS OF THE POSTERIOR THORACIC WALL PRESENTING AS A CHYLOUS-APPEARING SWELLING: A CASE REPORT

General Surgery

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ABSTRACT

Extrapulmonary tuberculosis (EPTB) often presents with atypical features that delay diagnosis. We report a 33-year-old non-immunocompromised male with a three-month progressive, painless, fluctuant swelling over the right posterior thoracic wall, following a history of vigorous body massage. Contrast CT thorax showed an extensive hypodense intramuscular collection ($11.5 \times 1.9 \times 17.8$ cm) spanning D1 to D9 vertebral levels, with mild cortical irregularity of the third and fourth ribs; the radiological impression favoured a pyogenic collection or haematoma. Aspiration yielded approximately 4 mL of white, odourless, low-viscosity fluid resembling chylous fluid, but chylomicrons were absent and the lipid profile was normal, excluding a chylous aetiology. Sputum culture grew only normal respiratory flora. Serology for HIV, HBsAg and HCV was non-reactive, and HbA1c was 6.23% (pre-diabetic range). With all conventional investigations unrevealing, Cartridge-Based Nucleic Acid Amplification Test (CBNAAT) on the aspirate detected *Mycobacterium tuberculosis*, with rifampicin resistance not detected. Anti-tubercular therapy (2HRZE/4HR) was started, with excellent clinical response and near-complete resolution of the swelling at four-month follow-up. This case underscores that tuberculosis must remain in the differential diagnosis of any unexplained soft-tissue collection irrespective of aspirate appearance, and that CBNAAT is indispensable when conventional tests fail.

KEYWORDS

Extrapulmonary Tuberculosis; Tuberculous Cold Abscess; CBNAAT; Chylous-Appearing Aspirate; Posterior Thoracic Wall

1. INTRODUCTION

Tuberculosis (TB) remains a major global health burden: an estimated 10.7 million people fell ill with TB in 2024, per the WHO Global Tuberculosis Report 2025 [1]. Pulmonary disease is the most common presentation, but extrapulmonary tuberculosis (EPTB) accounts for an estimated 15–20% of cases in immunocompetent patients and poses considerable diagnostic difficulty because of its atypical clinical manifestations [2].

Cold abscesses are well recognised in vertebral TB, rib caries and sternal osteomyelitis, but a posterior thoracic wall cold abscess without bony destruction in a non-immunocompromised adult is substantially rarer. The present case is notable on four counts: (1) a white, odourless, chylous-appearing aspirate from a proven tuberculous abscess — a presentation the authors could not identify in the indexed literature searched (Section 2); (2) a negative sputum culture yielding only normal respiratory flora; (3) CT evidence of extensive intramuscular tracking from D1 to D9 with mild rib cortical irregularity; and (4) a diagnosis reached solely through CBNAAT on the aspirate after all conventional investigations were exhausted.

2. Literature Survey

A literature search of PubMed-indexed and other biomedical sources was carried out on 25 September 2026, using the terms “tuberculous cold abscess,” “chest wall tuberculosis,” “posterior thoracic wall tuberculosis,” “chylous aspirate tuberculosis,” “chylomicron-negative aspirate tuberculosis” and “extrapulmonary tuberculosis chylous.” This did not identify a previously reported chest-wall or posterior thoracic wall tuberculous cold abscess with a chylous-appearing, chylomicron-negative aspirate.

Chest wall cold abscesses have previously been reported in association with rib caries [3] and sternal tuberculosis [4], but posterior thoracic wall cold abscesses without osseous involvement are rarely described. Prior reports consistently describe tuberculous cold abscess aspirate as caseous, viscous or grey-white in appearance. Separately, tuberculous chylothorax and chylous ascites are recognised, though rare, entities in which true chyle — with elevated triglycerides and, in a minority of cases, demonstrable chylomicrons — accumulates in the pleural or peritoneal cavity secondary to thoracic-duct or lymphatic involvement; a systematic review identified 37 such cases in the literature [13]. This differs mechanistically from the present case, in which the collection was an intramuscular soft-tissue abscess with no thoracic-duct or lymphatic pathology, and the aspirate was chylous in appearance only, with a normal triglyceride level and absent chylomicrons. Sputum acid-fast bacilli sensitivity for EPTB is under 40% owing to the paucibacillary nature of extrapulmonary lesions [5]. GeneXpert MTB/RIF (CBNAAT), WHO-endorsed for EPTB since 2013, offers an estimated 79–81% sensitivity and 99% specificity on

non-respiratory specimens, with simultaneous rifampicin-resistance detection within two hours [6].

3. Problem Definition

- To report an exceptionally rare presentation of EPTB as a posterior thoracic wall cold abscess with a white, odourless, chylous-appearing aspirate in a non-immunocompromised adult male.
- To document the stepwise diagnostic workup and the failure of conventional investigations, highlighting the role of CBNAAT when routine diagnostics are unrevealing.
- To discuss pre-diabetic HbA1c and elevated globulin as possible biochemical clues towards a chronic infective/tuberculous aetiology.

4. Methodology / Approach

Study Design: Single case report from the Department of General Surgery, SLIMS, Osudu, Puducherry, prepared in compliance with CARE Case Report Guidelines 2013. Written informed patient consent was obtained prior to data collection and publication.

Patient: A 33-year-old male (anonymised as “Patient J”), non-immunocompromised (HIV, HBsAg and HCV non-reactive), with HbA1c 6.23% (pre-diabetic range) and normal renal function. No prior history of TB.

Presenting Complaint: A progressive, painless swelling over the right scapular/upper back region of three months' duration, following a history of vigorous body massage. No fever, night sweats, cough, haemoptysis or other constitutional symptoms.

The following investigations were performed and are presented sequentially in Section 5: clinical examination; complete blood count; HIV, HBsAg and HCV serology; HbA1c and random blood glucose; renal function and electrolytes; sputum culture; lipid profile and aspiration of the swelling with chylomicron assay; CT thorax; and CBNAAT (GeneXpert MTB/RIF) on the aspirate. Anti-tubercular therapy was initiated per NTEP weight-based dosing (2HRZE/4HR) once TB was confirmed, with liver function monitored at 2 and 4 weeks.

5. Results & Discussion

5.1 Clinical Examination

The patient was afebrile and haemodynamically stable, with no peripheral lymphadenopathy. The swelling over the right scapular/infrascapular region was soft, compressible, fluctuant, painless and non-tender, with positive transillumination; overlying skin was normal (Table 1, Figure 1).

Table 1: Clinical Examination Findings

Parameter	Finding
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Location	Right posterior thoracic wall / infrascapular region
CT-measured extent	D1 to D9 vertebral levels (11.5 × 1.9 × 17.8 cm — TR × AP × CC)
Consistency	Soft, fluctuant, compressible
Tenderness / pain	Non-tender, painless
Overlying skin	Normal — no erythema, punctum or sinus
Bony involvement	Mild cortical irregularity — 3rd and 4th ribs (CT-confirmed)



Figure 1: Right Upper Back — Painless Fluctuant Swelling at Presentation (White Background; Non-Erythematous Skin; No Sinus)

5.2 Outside-hospital Ultrasound (Pre-referral)

Prior to surgical referral, an ultrasound of the right upper back was performed at an outside centre (10 April 2026). It showed a large hypoechoic intramuscular collection with internal moving echoes, favoured to be a haematoma, involving the trapezius and rhomboid muscles, measuring at least 11 × 10.2 × 2.3 cm and extending superiorly to the level of the superior scapular border, with suspicious intrathoracic extension through an intercostal space; clinical correlation and further evaluation were recommended (Table 2). This outside impression of a likely haematoma — later echoed by the CT impression of “pyogenic collection ≥ haematoma” — was the first of several findings that pointed away from tuberculosis before CBNAAT ultimately established the diagnosis.

Table 2: Outside-hospital Ultrasound Findings, Right Upper Back (10 April 2026)

Parameter	Finding
Modality / site	Ultrasound, right upper back
Collection	Large hypoechoic collection with moving echoes, favoured haematoma
Muscles involved	Trapezius, rhomboid
Size	At least 11 × 10.2 × 2.3 cm
Extent	Superiorly to the level of the superior border of scapula
Other	Suspicious intrathoracic extension through an intercostal space

5.3 Haematology

CBC revealed mild microcytic, hypochromic anaemia consistent with a chronic process. Total WBC and differential were within normal limits, consistent with immunocompetent status.

Table 3: Complete Blood Count (Day 1). *Verify this MCV Reference Range Against Your Laboratory's Reported Range Before Submission.

Investigation	Result	Reference	Interpretation
Haemoglobin	11.1 g/dL	13.0–18.0	Low
PCV	33.0%	M: 40–50	Low
MCV	78.0 fL	83–101*	Microcytic
MCH	26.2 pg	27–32	Low
RDW	17.5%	10–15	Elevated
Total WBC	6010/mm ³	4000–11000	Normal
Platelets	3.29 × 10 ⁵	1.5–4.0	Normal

5.4 Metabolic, Serology and Liver Function Panel (Days 1–16)

Biochemistry confirmed immunocompetence, assessed fitness for ATT, and investigated a chylous aetiology. Elevated globulin (4.1 g/dL) indicated a chronic inflammatory pattern; the lipid profile and chylomicron assay were normal, excluding a chylous aetiology.

Table 4: Metabolic, Serology and Liver-function Panel, SLIMS Central Clinical Laboratory

Investigation	Result	Interpretation
HIV / HBsAg / HCV	All non-reactive	Immunocompetent
HbA1c	6.23%	Pre-diabetic range
Serum glucose (R)	141.2 mg/dL	Borderline elevated
Urea / Creatinine	13.3 / 0.78 mg/dL	Normal — safe for ATT
Na / K / Cl	138.9 / 3.77 / 104.4	All normal
Triglycerides	62.1 mg/dL	Normal — chyloma excluded
Total cholesterol / LDL	178 / 130 mg/dL	Normal
Total protein / Globulin	8.21 / 4.1 g/dL	Globulin elevated — chronic inflammation
SGOT / SGPT / ALP	13.6 / 12.4 / 116 U/L	Normal — safe for ATT

5.5 CT Thorax

CT thorax documented an extensive intramuscular collection with rib cortical irregularity; the radiologist's primary impression was pyogenic collection/haematoma, with recommendation for microbiological evaluation to rule out TB.

Table 5: CT Thorax Findings, SLIMS Radiology, Day 1

Parameter	Finding
Collection size	11.5 × 1.9 × 17.8 cm (TR × AP × CC)
Vertebral extent	D1 to D9
Muscles involved	Trapezius, rhomboids, erector spinae
Extra-pleural component	2.0 × 3.8 × 5.5 cm communicating collection
Rib involvement	Mild cortical irregularity — posterior 3rd and 4th ribs
Vertebral / spinal	No lytic/sclerotic lesion; mild degenerative changes only
Pulmonary	Centrilobular nodules — posterior segment, right upper lobe
Impression	Pyogenic collection >> haematoma; microbiological evaluation to rule out TB

5.6 Sputum Culture and Aspiration

Sputum culture (Day 4, reported Day 6) grew normal respiratory tract flora, with no pathogen isolated — an expected finding in EPTB given its paucibacillary nature, which did not exclude TB. Aspiration of the swelling under aseptic precautions yielded approximately 4 mL of white, odourless, low-viscosity fluid, macroscopically resembling chylous fluid. The chylomicron assay was absent and the lipid profile on the aspirate was normal, definitively excluding a chylous aetiology (Figure 2).



Figure 2: White, Odourless, Low-viscosity Aspirate (~4 mL); Chylomicrons Absent — chylous Aetiology Excluded

5.7 CBNAAT (GeneXpert MTB/RIF, Day 15)

Following exhaustion of conventional modalities, CBNAAT was performed on the aspirate and registered on the Nikshay portal per NTEP guidelines, at the Government Hospital for Chest Diseases.

Table 6: CBNAAT Result

Field	Data
Test type	CBNAAT (GeneXpert MTB/RIF)
Request date	27 April 2026 (Day 15)
Testing laboratory	Government Hospital for Chest Diseases
Portal registration	Nikshay Portal — NTEP Guidelines
Final interpretation	M. tuberculosis detected; rifampicin resistance not detected

A sputum specimen sent for CBNAAT (12 May 2026) was negative for M. tuberculosis, consistent with the negative conventional sputum culture and supporting a predominantly extrapulmonary, paucibacillary pulmonary process rather than concurrent active pulmonary disease.

5.8 Stepwise Investigation Summary

Table 7: Sequential Investigation Results Leading to CBNAAT Diagnosis

Investigation	Day	Result / finding
Outside ultrasound	– (10 Apr 2026, pre-referral)	Hypoechoic collection ~11 × 10.2 × 2.3 cm, favoured haematoma; suspicious intrathoracic extension
CT thorax	1	Hypodense collection 11.5 × 17.8 cm, D1–D9; rib irregularity; centrilobular nodules RUL
CBC	1	Hb 11.1 g/dL (low); WBC 6010 (normal); MCV 78 (microcytic)
HIV / HBsAg / HCV	1	All non-reactive — immunocompetent
HbA1c / RBS	1	6.23% (pre-diabetic); glucose 141.2 mg/dL
Urine routine	1	Normal — no albuminuria, no haematuria
RFT + electrolytes	3	All normal — safe for ATT
Sputum culture	6	Normal respiratory flora — no pathogen isolated
Lipid profile / aspirate	8 / 15	TG 62.1 mg/dL; chylomicrons absent — chyloma excluded
LFT	16	Globulin 4.1 g/dL (elevated); AST/ALT normal
CBNAAT (aspirate)	15 (27 Apr 2026)	MTB detected; rifampicin resistance not detected
CBNAAT (sputum)	– (12 May 2026)	MTB not detected

5.9 Treatment and Follow-up

Table 8: ATT Regimen

Phase	Duration	Drugs — NTEP weight-based dosing (daily oral)
Intensive	2 months	Isoniazid (H) 300 mg + Rifampicin (R) 450 mg + Pyrazinamide (Z) 1500 mg + Ethambutol (E) 1200 mg
Continuation	4 months	Isoniazid (H) 300 mg + Rifampicin (R) 450 mg
Total	6 months	2HRZE / 4HR — NTEP Guidelines



Figure 3: Right Upper Back at Four-month Follow-up After ATT — complete Resolution of the Swelling

ATT was initiated on 29 April 2026, two days after diagnosis, administered as a weight-band fixed-dose combination (4-FDC, 4 tablets daily; weight 60 kg) per NTEP dosing guidelines. LFT monitoring at 2 and 4 weeks post-ATT (AST 13.6 U/L, ALT 12.4 U/L, ALP 116 U/L) remained within normal limits, with no ATT-related hepatotoxicity. At four-month follow-up the swelling had resolved, with no residual mass on inspection or palpation (Figure 3).

5.10 DISCUSSION

The diagnostic pathway in this case followed sequential elimination of differentials. CT thorax raised the possibility of a pyogenic collection or haematoma but appropriately recommended microbiological evaluation. Sputum culture and the chylous-like appearance of the aspirate each seemed, in turn, to argue against TB, until CBNAAT on the aspirate resolved the impasse: MTB detected, rifampicin sensitive [6].

The white, low-viscosity appearance of the aspirate is postulated to arise from lipolysis of mycobacterial cell-wall constituents — particularly mycolic acids — by host macrophages during chronic granulomatous inflammation [7,8]; this remains a proposed explanation rather than a mechanism directly demonstrated in this case.

The patient's HbA1c of 6.23% places him in the pre-diabetic range. Pre-diabetes has been associated with subtle immunological deficits that may predispose to TB reactivation or atypical progression [9]. The elevated globulin (4.1 g/dL) represents a reversal of the albumin-to-globulin ratio, a biochemical feature described in chronic infection/inflammation including tuberculosis [10].

The CT thorax documented a remarkably extensive collection spanning D1 to D9 (11.5 × 17.8 cm longitudinally), tracking between trapezius, rhomboids and erector spinae with intrathoracic extension. This degree of intramuscular dissection without vertebral destruction illustrates TB's propensity for tracking along fascial planes [11].

Table 9: Differential Diagnosis — chyloma vs. Lipoma vs. Present Case

Feature	Chyloma	Lipoma	Present case
Aspirate colour	White, milky	None (solid)	White, odourless
Chylomicrons	Present	Absent	Absent
Triglycerides	Elevated	Normal	Normal, 62.1 mg/dL
Sputum culture	Negative	Negative	Normal flora only
CT finding	Fluid density	Fat density	Fluid, D1–D9
Rib involvement	None	None	Cortical irregularity
CBNAAT	Negative	Negative	Positive — MTB
ATT response	None	None	Complete resolution

6. CONCLUSION

This case documents a rare and diagnostically deceptive presentation of extrapulmonary tuberculosis as a posterior thoracic wall cold abscess in a non-immunocompromised, pre-diabetic adult male. The white, odourless, chylous-appearing aspirate — despite absent chylomicrons and a normal lipid profile — represents an atypical mimicry of chylous pathology. CT thorax demonstrated an extensive intramuscular collection from D1 to D9 with mild rib cortical irregularity, underscoring TB's ability to track along fascial planes.

All conventional investigations, including sputum culture, failed to establish the diagnosis; it was reached exclusively by CBNAAT (MTB detected, rifampicin sensitive), registered via Nikshay. ATT (2HRZE/4HR) was initiated with satisfactory monitoring and an excellent clinical response, with resolution of the swelling by four-month follow-up.

Three clinical lessons follow: (1) TB should remain in the differential diagnosis of any unexplained soft-tissue collection regardless of aspirate appearance; (2) CBNAAT on aspirate is indispensable and should be considered early when conventional tests are unrevealing; (3) pre-diabetic HbA1c and elevated globulin may be biochemical clues pointing towards a chronic infective/TB aetiology, worth noting though not diagnostic on their own.

7. Future Scope

This case adds an atypical aspirate morphology to the recognised spectrum of tuberculous cold abscess and reinforces the need for a low threshold for CBNAAT testing in unexplained soft-tissue collections, even when initial radiological and microbiological findings suggest an alternative diagnosis. Prospective, multicentre case series correlating aspirate biochemistry (lipid content, chylomicron status) with tuberculous versus non-tuberculous aetiology could help characterise this presentation further. Wider clinician awareness — through case-based teaching and inclusion in differential-diagnosis algorithms for chest-wall swellings — may reduce diagnostic delay in similar future presentations.

Declarations

Patient Consent: Written informed consent was obtained for publication, including images and laboratory data.

Ethics: Institutional Ethics Committee waiver obtained, SLIMS, Osudu, Puducherry.

Competing Interests: None declared.

Funding: None.

NTEP Compliance: Case registered on the Nikshay portal.

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