



Article Type: Original Research Article

Cutaneous Manifestations of Tuberculosis: A Clinical Study at A Tertiary Care Centre

¹Dr. Gunda Sushmitha, Post Graduate, Department of Dermatology, Venerology and Leprosy, Mamata Medical College, Khammam, Telangana, India

²Dr. Uma Prasanna Lakshmi, Professor and HOD, Department of Dermatology, Venerology and Leprosy, Mamata Medical College, Khammam, Telangana, India

³Dr. Sushma Latha, Professor, Department of Dermatology, Venerology and Leprosy, Mamata Medical College, Khammam, Telangana, India

⁴Dr. SK. Naseema, Assistant Professor, Department of Dermatology, Venerology and Leprosy, Mamata Medical College, Khammam, Telangana, India

⁵Dr. Yannamani Sai Supriya, Senior Resident, Department of Dermatology, Venerology and Leprosy, Mamata Medical College, Khammam, Telangana, India

Corresponding Author: Dr. Gunda Sushmitha, Post Graduate, Department of Dermatology, Venerology and Leprosy, Mamata Medical College, Khammam, Telangana, India

Conflict of interest: Nil

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>).

Abstract

Background: Cutaneous tuberculosis (CTB) is an uncommon manifestation of extrapulmonary tuberculosis. It shows various clinical presentations that mimic other dermatological disorders, making diagnosis challenging. Regional studies are essential to understand its clinicomorphological spectrum and facilitate early diagnosis.

Objectives: To determine the demographic characteristics of patients with cutaneous tuberculosis and to assess the frequency of different clinicomorphological variants.

Materials and Methods: A hospital-based descriptive study was conducted in the Department of Dermatology,

Venerology and Leprosy at a tertiary care teaching centre from April 2025 to March 2026. 20 patients with clinically suspected cutaneous tuberculosis fulfilling the inclusion criteria were enrolled. Detailed clinical evaluation was done. Patients were classified into different clinicomorphological variants based on clinical findings supported by histopathological and relevant laboratory investigations.

Results: 20 patients with clinically diagnosed cutaneous tuberculosis were included in the study. The mean age was 42.6 years, and females predominated (65%), with a female-to-male ratio of 1.8:1. The majority of patients belonged to the middle-aged age group (35%), followed by the geriatric age group (30%). Tuberculosis verrucosa

cutis was the most common clinicomorphological variant, followed by lupus vulgaris and papulonecrotic tuberculids. Scrofuloderma, erythema nodosum, lichen scrofulosorum, and tuberculous chancre are rarely seen.

Conclusion: Tuberculosis verrucosa cutis was the predominant clinicomorphological variant observed in the present study, followed by lupus vulgaris and papulonecrotic tuberculids. The findings prove the diverse clinical spectrum of cutaneous tuberculosis and show the importance of maintaining a high index of clinical suspicion with clinicopathological correlation for early diagnosis and timely management.

Keywords: Cutaneous tuberculosis; Tuberculosis verrucosa cutis; Lupus vulgaris; Papulonecrotic tuberculid; Extrapulmonary tuberculosis; Clinicomorphological spectrum.

Introduction

Tuberculosis (TB) is one of the major infectious diseases, caused mainly by *Mycobacterium tuberculosis* and continues to pose a major public health challenge, particularly in low- and middle-income countries. According to the World Health Organization (WHO), tuberculosis is one of the main infectious causes of mortality, and millions of new cases were reported annually. India contributes majorly to the highest global burden of tuberculosis, with one-fourth of all incident cases worldwide.¹

Though pulmonary tuberculosis constitutes most cases, extrapulmonary tuberculosis (EPTB) accounts for around 15–20% of all tuberculosis cases in immunocompetent individuals and up to 50% among immunocompromised patients.² Cutaneous tuberculosis (CTB) is rare type, representing 1–2% of extrapulmonary tuberculosis and less than 2% of all dermatological disorders seen in routine clinical practice.³ In spite of its rarity, cutaneous

tuberculosis is clinically significant because of its chronic course, varied morphology, diagnostic difficulty, and association with systemic tuberculosis.

Cutaneous tuberculosis results from infection by *Mycobacterium tuberculosis*, *Mycobacterium bovis*, or, rarely, after Bacillus Calmette–Guérin (BCG) vaccination. The disease may develop through exogenous inoculation, contiguous spread from an underlying focus, hematogenous dissemination, or lymphatic spread. The clinical presentation depends on the host's immune status, bacterial load, route of infection, and previous sensitization to mycobacterial antigens.⁴

Some of the clinicopathological variants of cutaneous tuberculosis are: lupus vulgaris, tuberculosis verrucosa cutis, scrofuloderma, tuberculous chancre, orificial tuberculosis, acute miliary tuberculosis, and the tuberculids like papulonecrotic tuberculid and lichen scrofulosorum.⁵ Among these, lupus vulgaris is the commonest form in many European countries, and tuberculosis verrucosa cutis and scrofuloderma are commonly reported from India and other tuberculosis-endemic regions.⁶ The distribution of various clinical forms differs as per the geographical location, socioeconomic conditions, nutritional status, Bacillus Calmette–Guérin vaccination coverage, and host immunity.

Diagnosis of cutaneous tuberculosis poses challenge because lesions commonly mimic numerous inflammatory, infectious, granulomatous, and neoplastic dermatoses. Histopathological examination, Ziehl–Neelsen staining, mycobacterial culture, tuberculin skin testing, cartridge-based nucleic acid amplification testing (CBNAAT), polymerase chain reaction (PCR), and clinicoradiological correlation are valuable adjuncts; however, the paucibacillary nature of many forms,

particularly lupus vulgaris and tuberculosis verrucosa cutis, reduces microbiological confirmation rates.⁷ High index of clinical suspicion combined with histopathological correlation is essential for early diagnosis and timely initiation of antitubercular therapy.

Previous Indian studies showed many variations in the frequency of different clinicomorphological variants of cutaneous tuberculosis. These variations show the importance of regional epidemiological studies to understand the prevailing spectrum of disease and facilitate early recognition by clinicians.

Aim

To study the spectrum of cutaneous manifestations associated with tuberculosis among patients.

Objectives

1. To determine the demographic characteristics of affected patients.
2. To assess the relative frequency of different clinicomorphological variants of cutaneous tuberculosis.

Materials and Methods

Study Design

This was a hospital-based descriptive study done in the Department of Dermatology, Venereology and Leprosy (DVL) at a tertiary care teaching centre.

Study Duration

The study was done for one year from April 2025 to March 2026.

Study Population

All patients attending the DVL outpatient department during the study period with clinical suspicion of cutaneous tuberculosis were evaluated for inclusion.

Sample Size

20 patients fulfilling the inclusion criteria were enrolled in the study.

Inclusion Criteria

- Patients of any age and either sex presenting with clinical features suggestive of cutaneous tuberculosis.
- Patients willing to participate and provide written informed consent.
- Patients undergoing appropriate diagnostic evaluation, including skin biopsy where indicated.

Exclusion Criteria

- Patients already receiving antitubercular therapy before presentation.
- Patients with inadequate clinical or histopathological information.
- Patients in whom an alternative diagnosis was established after evaluation.

Clinical Evaluation

Complete clinical history was obtained from each patient, including age, sex, occupation, duration of lesions, presenting symptoms, history of trauma, previous tuberculosis, family history of tuberculosis, Bacillus Calmette–Guérin vaccination status when available, and associated constitutional symptoms such as fever, weight loss, and night sweats.

Dermatological examination was performed to document the morphology, number, distribution, size, and anatomical location of lesions. Regional lymph node examination and systemic examination were carried out whenever indicated.

Diagnostic Evaluation

Routine laboratory investigations like complete blood count, erythrocyte sedimentation rate, and relevant biochemical investigations were done wherever indicated. Mantoux (tuberculin skin) testing was performed in clinically appropriate patients. Chest radiography and additional radiological investigations were undertaken to

identify any associated systemic tuberculosis whenever indicated.

Skin biopsy specimens were obtained from representative lesions after obtaining informed consent. Histopathological examination using hematoxylin and eosin staining was performed to identify granulomatous inflammation, epithelioid cell granulomas, Langhans giant cells, and caseation necrosis where present. Ziehl–Neelsen staining for acid-fast bacilli and additional microbiological investigations were done if indicated based on clinical suspicion and availability.

Patients were classified into different clinicomorphological variants of cutaneous tuberculosis based on clinical findings supported by histopathological and relevant laboratory investigations.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using descriptive statistical methods. Continuous variables were expressed as mean ± standard deviation

where appropriate, categorical variables were presented as frequencies and percentages.

Ethical aspects: Informed consent was taken from every participant.

Results

20 patients with clinically diagnosed cutaneous tuberculosis were included in the study during the study period from April 2025 to March 2026.

Demographic Characteristics

Among the 20 patients, 13 (65%) were females and 7 (35%) were males, yielding a female-to-male ratio of 1.8:1 (Table 1). Female patients constituted the majority of the study population. Mean age was 42.6 years.

Table 1: Age Distribution of Study Participants (n = 20)

Age Group	Number of Patients (n)	Percentage (%)
Pediatric population	3	15
Adolescents	4	20
Middle-aged adults	7	35
Geriatric age group	6	30
Total	20	100

Table 2: Sex Distribution of Study Participants (n = 20)

Sex	Number (n)	Percentage (%)
Male	7	35
Female	13	65
Total	20	100

Clinical Spectrum of Cutaneous Tuberculosis

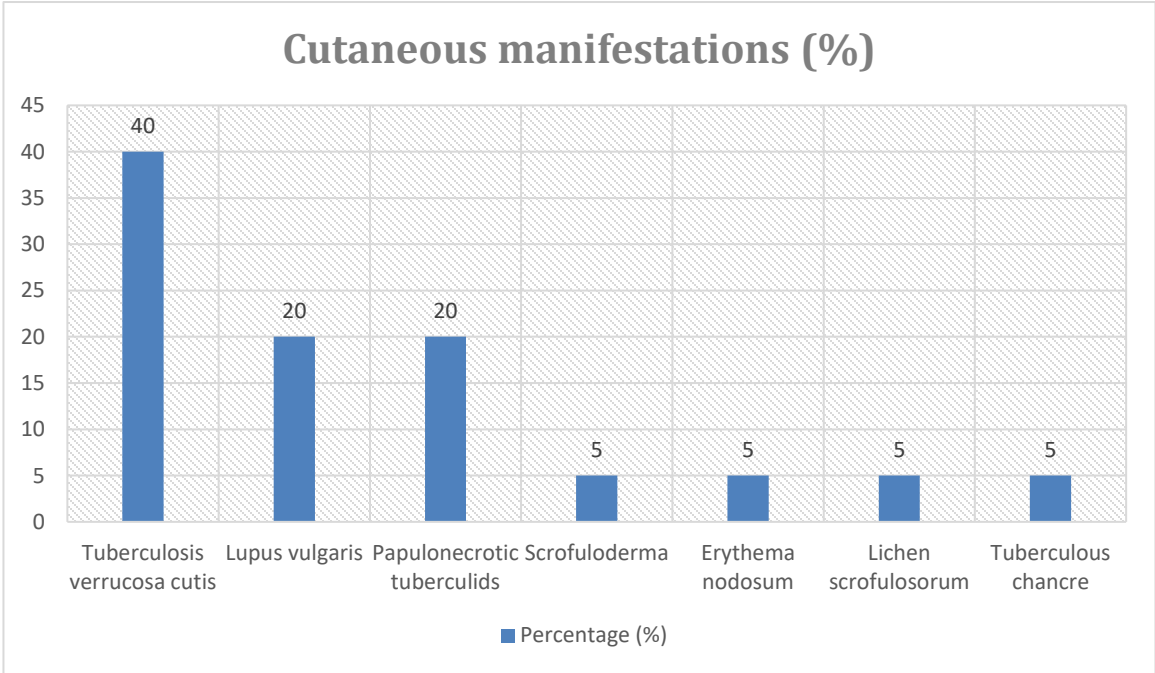
The clinical spectrum of cutaneous tuberculosis observed in the present study is summarized in Graph 1.

Tuberculosis verrucosa cutis (TBVC) was the most common clinical variant, accounting for 8 patients (40%). Lupus vulgaris and papulonecrotic tuberculids were the

second most common manifestations, each occurring in 4 patients (20%).

Less common variants included scrofuloderma, erythema nodosum, lichen scrofulosorum, and tuberculous chancre, with one patient (5%) diagnosed with each condition.

Graph 1: Distribution of Various Cutaneous Manifestations of Tuberculosis



Tuberculosis verrucosa cutis is the predominant clinicomorphological variant encountered during the study, representing 40% of all cases. Lupus vulgaris - 20% of patients and was the second most common classical form of cutaneous tuberculosis. Papulonecrotic tuberculids also constituted 20% of the cases.

Scrofuloderma, erythema nodosum, lichen scrofulosorum, and tuberculous chancre were relatively uncommon, with each variant comprising 5% of the study population.

Overall, the findings show that tuberculosis verrucosa cutis was common manifestation, followed by lupus vulgaris and papulonecrotic tuberculids.

Discussion

Cutaneous tuberculosis (CTB) is a rare form of extrapulmonary tuberculosis with diverse clinical manifestations that pose diagnostic challenges because of their resemblance to several inflammatory and infectious dermatoses. The present study evaluated the demographic characteristics and clinicomorphological spectrum of cutaneous tuberculosis among patients attending a tertiary care centre.

In the present study, females constituted 65% of the study population, with a female-to-male ratio of 1.8:1, indicating a female predominance. Similar observations were reported by Arora et al., who also observed female predominance among patients with cutaneous

tuberculosis.¹⁰ Kumar and Muralidhar reported a slight male predominance in their 20-year prospective study from North India, while Sehgal et al. observed an almost equal sex distribution.¹¹ These differences could be due to regional epidemiological variations, health-seeking behaviour, and differences in study populations.

The mean age of patients in the present study was 42.6 years, with the majority belonging to the middle-aged age group. Almost findings have been reported in previous Indian studies, where cutaneous tuberculosis was most frequently observed during the third to fifth decades of life.^{11,12} The predominance of middle-aged adults may reflect greater occupational exposure and increased opportunities for exogenous inoculation in this economically active population.

Tuberculosis verrucosa cutis (TBVC) was the most common clinicomorphological variant in the present study. Though some Indian studies have identified lupus vulgaris as the commonest form of cutaneous tuberculosis, geographical variations in disease pattern have been consistently reported.^{13,14} Kumar, in their landmark prospective study, found lupus vulgaris to be the predominant clinical variant, whereas Patra et al. reported tuberculosis verrucosa cutis as one of the common presentations in eastern India.¹¹ The predominance of TBVC in the present study may be related to regional differences in environmental exposure, occupational factors, and host immune response.

Lupus vulgaris accounts 20% of the cases in the present study and represented the second most common classical form of cutaneous tuberculosis. Lupus vulgaris is a chronic paucibacillary form occurring in patients with moderate to high immunity and has consistently been reported as the commonest variant in many Indian and international studies.^{13,14} Though its frequency in our

study was lower than that reported by Kumar, its occurrence shows the need for early diagnosis to prevent progressive tissue destruction and permanent scarring.³

Papulonecrotic tuberculids also accounted for 20% of the cases. Tuberculids represent hypersensitivity reactions to *Mycobacterium tuberculosis* in patients with good immunity and are relatively uncommon in most published series.¹⁴ The comparatively higher proportion observed in the present study may reflect differences in referral patterns, patient selection, or the relatively small sample size.

Scrofuloderma, erythema nodosum, lichen scrofulosorum, and tuberculous chancre each accounted for 5% of the study population. Similar observations have been reported by Gopinathan et al. and other Indian investigators, who found these variants to be relatively uncommon compared with lupus vulgaris and tuberculosis verrucosa cutis.¹⁴ Some manifestations like lichen scrofulosorum and tuberculous chancre are rarely seen but. They are important differential diagnoses in endemic regions.

The present study was limited by its relatively small sample size (n = 20) and its single-centre design, which may limit the generalizability of the findings. But it provides valuable regional data on the demographic characteristics and clinicomorphological spectrum of cutaneous tuberculosis encountered in a tertiary care centre.

Conclusion

Cutaneous tuberculosis is an uncommon but important manifestation of extrapulmonary tuberculosis with a wide spectrum of clinical presentations. In the present study, tuberculosis verrucosa cutis was the most common clinicomorphological variant, followed by lupus vulgaris and papulonecrotic tuberculids. The varied clinical

manifestations show the need for a high index of clinical suspicion and careful clinicopathological correlation to establish an early diagnosis. Though limited by a small sample size, this study provides valuable regional data that may aid clinicians in the timely recognition and appropriate management of cutaneous tuberculosis.

References

1. World Health Organization. Global Tuberculosis Report 2023. Geneva: WHO; 2023.
2. Sharma SK, Mohan A. Extrapulmonary tuberculosis. *Indian J Med Res*. 2004;120(4):316-53.
3. Frankel A, Penrose C, Emer J. Cutaneous tuberculosis: a practical case report and review. *J Clin Aesthet Dermatol*. 2009;2(10):19-27.
4. Barbagallo J, Tager P, Ingleton R, Hirsch RJ, Weinberg JM. Cutaneous tuberculosis: diagnosis and treatment. *Am J Clin Dermatol*. 2002;3(5):319-28.
5. Santos JB, Figueiredo AR, Ferraz CE, Oliveira MH, Silva PG, Medeiros VL. Cutaneous tuberculosis: epidemiologic, etiopathogenic and clinical aspects—Part I. *An Bras Dermatol*. 2014;89(2):219-28.
6. Bravo FG, Gotuzzo E. Cutaneous tuberculosis. *Clin Dermatol*. 2007;25(2):173-80.
7. Kumar B, Rai R, Kaur I, Sahoo B, Muralidhar S, Radotra BD. Childhood cutaneous tuberculosis: a study over 25 years. *Int J Dermatol*. 2001;40(1):26-32.
8. Ramam M, Mittal R, Ramesh V. How soon does cutaneous tuberculosis respond to treatment? Implications for a therapeutic test of diagnosis. *Int J Dermatol*. 2005;44(2):121-4.
9. Pandhi D, Reddy BSN, Chowdhary S, Khurana N. Cutaneous tuberculosis in Indian children: the importance of screening for internal organ involvement. *J Eur Acad Dermatol Venereol*. 2004;18(5):546-51.
10. Arora S, Arora G, Kakkar S. Cutaneous tuberculosis: a clinico-morphological study. *Med J Armed Forces India*. 2016;72(4):344-347.
11. Kumar B, Muralidhar S. Cutaneous tuberculosis: a twenty-year prospective study. *Int J Tuberc Lung Dis*. 1999;3(6):494-500.
12. Sehgal VN, Srivastava MD, Khurana VK. An appraisal of epidemiologic, clinical, bacteriologic, histopathologic and immunologic parameters in cutaneous tuberculosis. *Int J Dermatol*. 1987;26(8):521-526.
13. Patra AC, Gharami RC, Banerjee PK. A profile of cutaneous tuberculosis. *Indian J Dermatol*. 2006;51(2):105-107.
14. Gopinathan R, Pandit D, Joshi J, Jerajani H, Mathur M. Clinical and morphological variants of cutaneous tuberculosis and its relation to mycobacterium species. *Indian J Med Microbiol*. 2001;19:193-196.

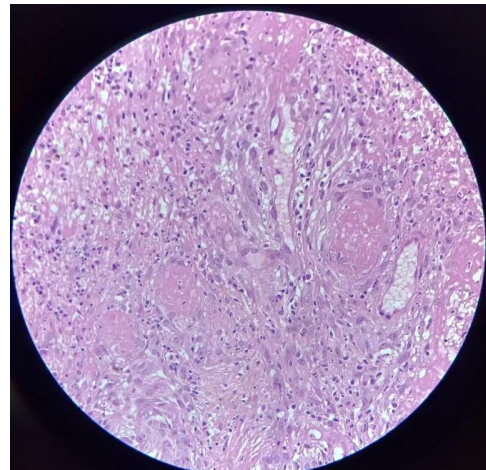


Figure 1: Histopathology of Tuberculous Verruca Cutis