

ORIGINAL ARTICLE**Cutaneous Tuberculosis – A Profile of Cases 3 Years Cross Sectional Study**Anita P Javalgi^{1*}, Balchandra Anka², Vijay D Dombale³¹Department of Pathology, Shri B. M. Patil Medical College, Bijapur-586103, (Karnataka), India.²Department of Dermatology, ³Department of Pathology, Shri Nijilingappa Medical College, Bagalkot-587102(Karnataka), India**Abstract:**

Background: Tuberculosis is an ancient disease known since pre-historic times and remains important infectious disease today in terms of morbidity, mortality and economic impact. Cutaneous tuberculosis makes up a small proportion (1.5%) of all cases of extra pulmonary tuberculosis. In a recent study from India cases of cutaneous tuberculosis make upto 0.15% of all skin outpatients. Irrespective of immunodeficiency status, cutaneous tuberculosis still contributes markedly in morbidity of developing countries and it remains at times a diagnostic challenge in dermatology clinic due to its varied clinical manifestations and varied histomorphology, hence proper clinical management with assisted histopathological diagnosis, the morbidity can be reduced. **Aim and Objective:** To study clinical and morphological variants of cutaneous tuberculosis with age and sex distribution. **Materials and Methods:** 3 years prospective study was done in the Department of Pathology, Shri Nijilingappa Medical College, Bagalkot from 2009 to 2011. Total 267 skin biopsies were received in the histopathology section. The biopsy tissue was processed as per routine procedure and stained with Hematoxylin and Eosin stains and special stains (ZN with 20% H₂SO₄). Microscopic features were studied and diagnosis of cutaneous tuberculosis made with sub typing and clinical co-relation. **Results:** Out of 267 skin biopsies, 37 were diagnosed as cutaneous tuberculosis based on clinical examination and morphology, Lupus vulgaris (62.16%) was a commonest variant affecting males (64.86%) predominantly. Most frequent age group affected was 21-40 years (59.45%). Face and neck were the usual sites for manifestation. Forty one percent of cases were mantoux test positive. All cases were HIV negative and free from active pulmonary tuberculosis. **Conclu-**

sion: Lupus vulgaris remains most frequent form of cutaneous tuberculosis in dermatopathology irrespective of HIV status. Strong clinical suspicion, histopathological study and response to anti-tuberculosis treatment are sufficient for diagnosis and thus reducing the morbidity and mortality.

Keywords: Cutaneous Tuberculosis, Lupus Vulgaris, Head and Neck Region.

Introduction:

Tuberculosis has been associated with the humanity since ancient times, it remains one of the most important infectious diseases today in terms of morbidity, mortality and economic impact [1]. With emergence of antitubercular drug resistant strains and AIDS epidemic, there has been a worldwide rise in tuberculosis and studies related to it in recent years [2, 3]. Cutaneous tuberculosis represents 1.5% of all cases of extra-pulmonary tuberculosis. Studies from India report an incidence of 0.1% [3, 4]. Beyt et al [5] proposed a simplified scheme of classification which has gained wide acceptance,

- Endogenous: Scrofuloderma, Lupus vulgaris, Tuberculous gumma
- Exogenous: Tubercular chancre, Warty tuberculosis, Lupus vulgaris
- Tuberculides: Lichen scrofulosum, Papulo necrotic tuberculid, Erythema nodosum, Erythema induratum

Cutaneous tuberculosis with its wide range of variations in morphology, histopathology, immunology and treatment response, still poses a major challenge and we decided to study the subject further.

The aim of the study was to study the morphological variants of cutaneous tuberculosis with clinical co-relation, association with HIV, mantoux status and response to therapy.

Material and Methods:

A three years prospective study was done from 2009 January to December 2011 in the Department of Pathology, Shri Nijilingappa Medical College, Bagalkot, Karnataka, India

Patients with clinical suspicion of tuberculosis were included in the study and those who were already on anti-tuberculosis drugs were excluded from it.

Clinical details, history of BCG vaccination were recorded and routine investigations including complete blood count, ESR and urine examination, chest X-ray, ELISA for HIV, Mantoux test for tuberculosis were carried out.

Punch biopsy was taken from fully developed lesion and sent to histopathology department.

A total of 267 with skin biopsies were received and were fixed in standard formalin solution, processed as per routine procedure and stained with hematoxylin and eosin stain and special stains like ZN stain (using 20% H₂SO₄), Periodic Acid Schiff (PAS) was done.

Morphological characteristics of the biopsies were defined, recorded and accordingly classified.

Results:

We received 267 skin biopsies, 37 cases were diagnosed as cutaneous tuberculosis. Three sub types were identified in our study which was Lupus Vulgaris (LV), Tuberculosis Verruoca Cutis (TVC) and Scrofuloderma. Lupus vulgaris was commonest variant (N=23 cases, 62.1%) followed by TVC (N=10 cases, 27%) and scrofuloderma (N=4, 10.9%) (Table 1).

Lesions were predominantly seen in males (N=24, 64.8%) and commonest age group affected was 21-40 yrs (Table 2 and Table 3).

Youngest affected patient was 9 yrs old with

scrofuloderma and eldest one was 51 yrs old who was diagnosed as TVC. The commonly affected site was head and neck (38%), followed by lower extremities, upper extremities, back and trunk and only one case of TVC showed multiple site involvement (Table 4).

Table 1 - Distribution of Clinical Variants of Cutaneous Tuberculosis

Clinical Variants	Number of Cases	Percentage (%)
Lupus Vulgaris (LV)	23	62.1
Tuberculosis Verruoca Cutis (TVC)	10	27.0
Scrofuloderma	04	10.9

Table 2 - Sex Distribution with Clinical Variants

Clinical Variants	Male	Female	Total
LV	15	08	23
TVC	06	04	10
Scrofuloderma	03	01	04
Total	24	13	37

Abbreviations LV: Lupus Vulgaris, TVC: Tuberculosis Verrucae Cutis

Table 3 - Age Distribution of the Cases

Age Group	Lupus Vulgaris	TVC	Scrofuloderma
01-20 yrs	06	01	01
21-40 yrs	14	06	02
41-60 yrs	03	03	01
Total	23	10	04

Table 4-Distribution of Various Sites with Clinical Sub Types

Subtypes	Face & Neck	Upper extremities	Lower extremities	Trunk & back	Multiple sites
Lupus vulgaris (LV)	11	05	04	03	00
Tuberculosis Verruca Cutis (TVC)	01	04	03	01	01
Scrofuloderma	02	01	01	00	00

ELISA for HIV was negative in all cases. Montoux test was done in 26 cases and 12 were positive (Fig. 1).



Fig 1 : mantoux test : positive



Fig 2 : Lupus vulgaris – well demarcated reddish brown patch on cheek (apple jelly nodule).

Eleven cases showed hilar lymphadenopathy on chest X ray with no evidence of active pulmonary tuberculosis. On diagnosis patients were treated with anti-tuberculosis drugs for one year and response was noted on follow up every six months and the response was good.

Twenty three cases of lupus vulgaris were studied, with male predominance. Face and neck was commonly affected. Clinically reddish brown plaques containing deep seated nodules (1-4mm) classically called apple jelly nodules were noted (Fig. 2).

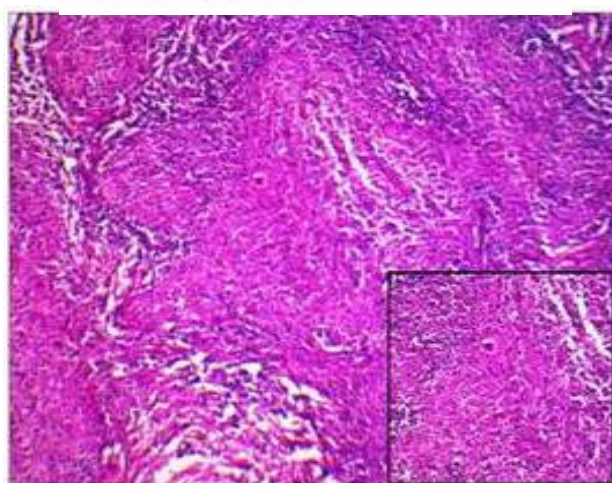


Fig 3: 100 X H&E Lupus vulgaris : tuberculoid granuloma seen
Inset : 200X H&E multinucleated giant cell with epithelioid cells and lymphocytes

Histomorphological features showed pseudoepitheliomatous hyperplasia, upper dermis showing granulomas which comprised of epithelioid cells, multinucleated giant cells, and dense infiltration by lymphocytes (Fig. 3).

A few cases showed secondary changes like epidermal atrophy, ulceration and hyperkeratosis. Tuberculosis verrucosa cutis was second common lesion,

affecting upper extremities and lower extremities with one case having multiple lesions. Patients presented with plaque like lesion, few with inflammatory border (Fig. 4).



Fig 4: Tuberculosis verrucosa cutis – verrucous plaque with inflammatory border on right foot

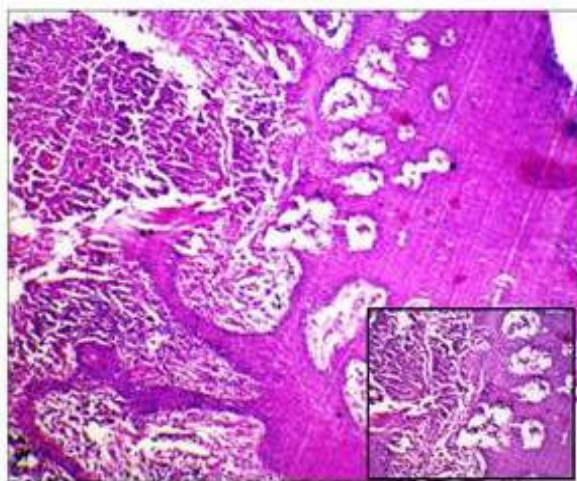


Fig 5: 100X H&E TVC: irregular acanthosis, hyperkeratosis, multiple small abscess, dermis show granuloma.
Inset : 200X abscess with neutrophils, dense lymphocytic infiltration



Fig 6 : Scrofuloderma : Inguinal region , few draining sinus also noted

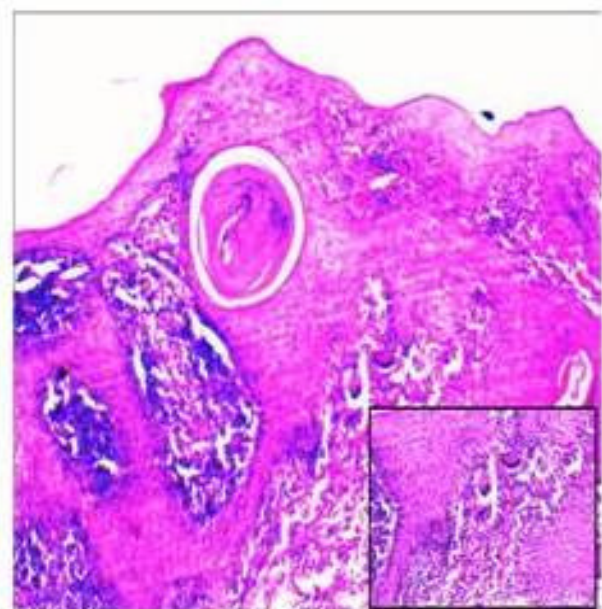


Fig 7 : 100X H&E Scrofuloderma: hyperkeratosis, focal ulceration with dense neutrophilic infiltration
Inset : 200X H&E : dermis showing mixed inflammation and Langhan's giant cells infiltration.

Microscopically lesions showed hyperkeratosis, irregular acanthosis, mixed inflammatory cell infiltrate in dermis composed of neutrophils and lymphocytes (Fig. 5).

Majority of cases had tuberculoid granuloma. Scrofuloderma was least observed, face and neck being commonest sites. Clinically few presented with draining abscess, rest with swelling especially cervical lymphadenopathy (Fig. 6).

Morphology was epidermal ulceration, a few of them were covered with necrosis, dense neutrophilic infiltration extending to dermis. Dermis also showed necrosis, lymphocytic infiltration, ill defined granulomas and foci of granulation tissue (Fig.7).

ZN stain in all cases was negative for acid fast bacilli.

Discussion:

The development of resistance to antitubercular drugs, immunodeficiency due to chemotherapy, AIDS, the incidence of tuberculosis has increased with 50% cases belonging to extrapulmonary tuberculosis [1, 6, 7].

In India tuberculosis continues to be the biggest public health problem and cutaneous tuberculosis remains a challenge, sometimes due to its unusual clinical manifestations and varied histomorphological features [3]. Lupus vulgaris is the wolf form of tuberculosis [4] and frequently affects lower extremities especially buttocks [6]. This LV lesion has been the commonest cause of cutaneous tuberculosis in present study which has also been observed by other authors (Table 5).

There have been contrast observations by Dwari BC et al [7], who have found TVC to be the commonest

variant in their study and Thakur BK et al have noticed scrofuloderma as the commonest lesion in their study.

In the present study male predominance has been noted which has been also noticed by study done by Patra et. al. and Agarwal et. al. [8].

The second and third decades have been frequently affected in our study which is in accordance with studies done by others. Usual site affected is head and neck, which has been also observed by Dwari BC et. al. and Agarwal et. al.

Malnutrition and low socio economic conditions are predisposing factors for cutaneous tuberculosis [9]. These predisposing factors have also been noted in the present study and by Patra et. al. [3], Dwari BC et. al. [7].

The positivity of Mantoux test has been reported from 68% to 100% in various studies [10, 11]. In the present study mantoux has been positive in 41% cases as only 12/26 cases are positive in comparison to 83.3% positivity in the study done by Thakur BK et. al. [12].

ELISA for HIV has been negative in all cases which is also noted by Patra et al and Thakur et al. In the present study 11 cases have shown hilar lymphadenopathy with no active pulmonary tuberculosis which gives evidence of primary sensitization by Mycobacterium tuberculosis infection. Though human disease with mycobacterium tuberculosis and M. Bovis is usually spread by droplets and the portal of entry is often the respiratory tract, skin can also be primarily in-

Table 5 - Comparison of Present Study with Other Studies

Clinical Variants	Mehta et. al. 1996	Patra et. al. 2002	Agarwal et. al. 2010	Present study 2012
Lupus Vulgaris (LV)	15 (50%)	60 (58.8%)	26 (54.1%)	23 (62.1%)
TVC	04 (13.33%)	20 (19.6%)	19 (39.5%)	10 (27%)
Scrofuloderma	11 (36.66%)	22 (21.5%)	03 (6.25%)	04 (10.8%)
Total	30	102	48	37

volved. Lupus Vulgaris occurs mainly in patients with moderate to high degree of immunity. The lesion arises due to inoculation by exogenous source and by hematogenous spread. Scrofuloderma manifests after breakdown of the skin overlying a tuberculous focus, usually a lymph node but sometimes an infected joint or bone. A patient with good immunity can develop TVC if accidental superinfection from extraneous source and autoinoculation or post traumatic inoculation with the infected sputa occurs [1, 4].

Staining with acid fast bacilli is negative in our study which has been also negative in all cases studies by Thakur et al [12].

Morphologically granulomatous reactions of skin are classified as infectious or non infectious, based on the presence or absence of an infectious pathogen serving as an inciting agent. Almost 1/4th of granulomatous lesions of skin are cutaneous tuberculosis [8]. They frequently present as diagnostic challenge and

the most close differential diagnose include, atypical mycobacterial infection, sarcoidosis, leprosy, foreign body granulomas, juvenile xanthogranuloma, cutaneous leishmaniasis staphylococcal abscess, mixed bacterial infections spirotrichosis, nocardiosis etc [1.8]. Histopathology has co-related very well with clinical findings and therapeutic response has confirmed the diagnosis.

Conclusion:

In the era of HIV, still lupus vulgaris remains most common cutaneous tuberculosis in the dermatopathology. And hence cutaneous tuberculosis continues to be the most elusive and more difficult diagnosis to make for dermatologist in the developing countries and thus the onus lies on the histopathologist to provide the verdict of final diagnosis [8]. A strong clinical suspicion, histopathology and response to antitubercular treatment are sufficient for diagnosis and to reduce the morbidity and mortality.

References:

1. Betul Sezgin, Ulviye Atilganoglu, Ozgul Yigit, Selma Sönmez Ergün, Nevin Cambaz, and Cuyan Demirkesen. Concomitant cutaneous metastatic tuberculosis abscesses and multifocal skeletal tuberculosis. *Indian J Dermatol* 2008; 53(3): 149-153.
2. Mehta SD, Singh IP, Bhardwaj BL. Pattern of cutaneous tuberculosis. *Indian J Dermatol* 1996; 41(3): 87-88.
3. Patra AC, Gharami RC, Banerjee PK. A profile of cutaneous tuberculosis. *Indian J Dermatol* 2006; 51(2): 105-107.
4. 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(4): 193-196.
5. Beyt BE Jr, Ortals DW, Santa Cruz DJ, Kobayashi GS, Eisen AZ, Medoff G. Cutaneous mycobacteriosis: analysis of 34 cases with a new classification of the disease. *Medicine (Baltimore)* 1981; 60(2):95-109.
6. Jain VK, Agarwal K, Jain S, Singh S. Hypertrophic lupus vulgaris : An unusual presentation. *Indian J Dermatol* 2009; 54(3):287-289.
7. Dwari BC, Ghosh A, Paudel R, Kishore P. A Clinicoepidemiological study of 50 cases of cutaneous tuberculosis in a tertiary care teaching hospital in Pokhara, Nepal. *Indian J Dermatol* 2010; 55(3): 233-237.
8. Agarwal R, Kumar M, Kumar P. Cutaneous Tuberculosis – A clinic-pathological study. *IJMS* 2012;3(2):1-5.
9. Bazex J, Bauriaud R, Margeury MC. Cutaneous Mycobacteriosis. *Rev Pract* 1996; 46(13): 1603-1610.
10. Acharya KM, Ranpara H, Dutta R, Mehta B. A clinicopathological study of 50 cases of cutaneous tuberculosis in Jamnagar District. *Indian J Dermatol Venereol Leprol* 1997; 63(5):301-303.
11. Arya L, Koranne RV, Deb M. Cutaneous tuberculosis in children: A clinico-microbiological study. *Indian J Dermatol Venereol Leprol* 1999; 65(3):137-139.
12. Thakur BK, Verma S, Debeeka H. A Clinicopathological study of cutaneous tuberculosis at Dibrugarh district, Assam. *Indian J of Dermatol* 2012; 57(1): 63-65.

*Author for Correspondence: Dr. Anita P. Javalgi, Department of Pathology, BLDEU's Shri B. M. Patil Medical College, Bijapur - 586103 (Karnataka), India Cell: 09739619068,
E-mail: javalgianita@gmail.com or anitajawalgi@yahoo.co.in