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Case Series

Dermatology Section

Cutaneous Tuberculosis- One Diagnosis, a Plethora of Differentials

NR VIGNESH[1], SIVARAMAKRISHNAN SANGAIAH[2], ASHOK N KUMAR[3], ARISHA SALAM[4]

ABSTRACT

Cutaneous Tuberculosis (TB) is a chronic bacterial infection. It is difficult to diagnose these lesions since they mimic various other dermatological conditions. Cutaneous tuberculosis has a wide range of variations in morphology, histopathology, immunology and treatment response and a diagnosis of cutaneous tuberculosis is very much common in developing countries like India. Cutaneous tuberculosis can be exogenous; endogenous: caused by contiguity or autoinoculation and by haematogenous spread; induced by the Calmette-Guérin bacillus and manifest as a tuberculoid. The diagnosis of the infection is supported through the direct test, culture, histopathology, tuberculin skin test, polymerase chain reaction, interferon-gamma release assay, and genotyping. Drugs used for treatment comprises of isoniazid, rifampicin, pyrazinamide and ethambutol. The authors hereby present a case series (six cases) of various types of lupus vulgaris and scrofuloderma that came to Dermatology Outpatient Department with similar findings.

Keywords: Bacille calmette-guérin, Lupus vulgaris, Lymph node, *Mycobacterium tuberculosis*

INTRODUCTION

Cutaneous tuberculosis can be acquired exogenously or endogenously and present as a multitude of differing clinical morphologies. Diagnosis of these lesions can be difficult, as they resemble many other dermatological conditions [1]. This case series highlights the importance of regular follow-up of patients for accurate diagnosis and treatment. The variety of erythematous lesions discussed in the cases given below are shown in [Table/Fig-1(a-f)].

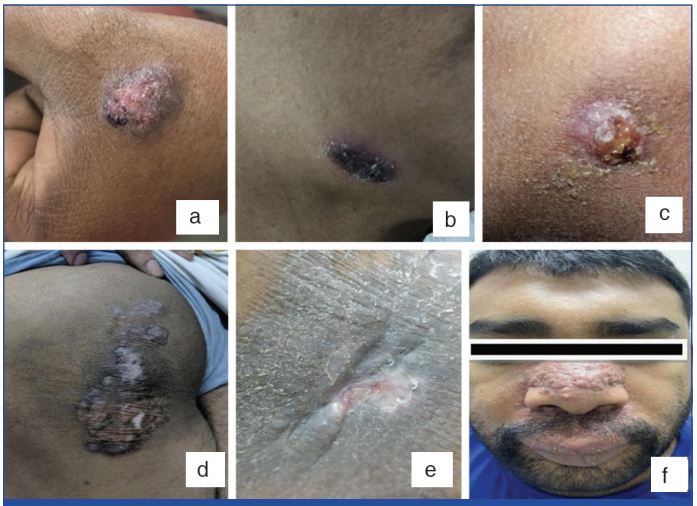
CASE SERIES

Case 1

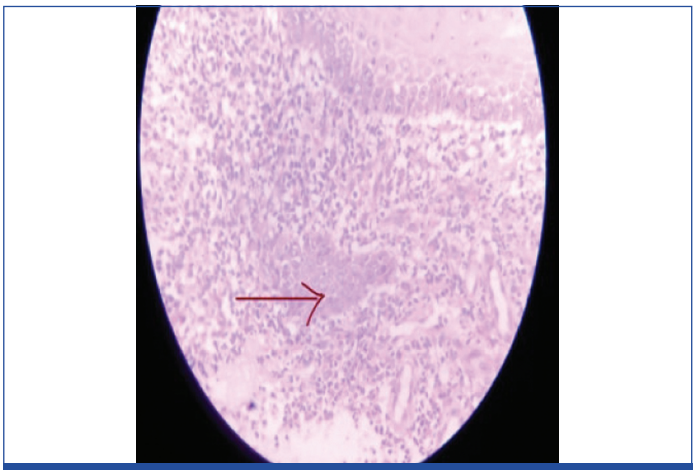
A 29-year-old male patient, a carpenter by profession presented with complaints of an asymptomatic raised lesion on left hand since nine months which was gradually increasing in size. He gave history of trauma before the lesion appeared. He did not give history of fever, joint pain and trauma. He did not give history of any co-morbidity. On examination, well-defined pigmented to erythematous crusted plaque seen over dorsum of left hand [Table/Fig-1a]. Mantoux test was positive and a biopsy from the lesion was sent for histopathological examination which revealed hyperkeratosis, acanthosis, epithelioid granuloma without caseation, lymphocytic infiltrates and Langerhans cells [Table/Fig-2]. A diagnosis of keratotic type of lupus vulgaris was confirmed and patient was started on anti-tubercular therapy, of nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg and ethambutol 275 mg. Patient is on regular follow-up and is symptomatically better. Improvement was seen after six months.

Case 2

A 36-year-old female patient, a housewife presented with a history of a raised lesion over right side of chin since seven months which was gradually increasing in size. She did not give history of itching, pain or burning sensation over the lesion. She had history of trauma eight months back. She did not give history of cough, fever, co-morbidities. On examination, well-defined hyperpigmented plaque with mild scaling and crusting present over right side of chin [Table/Fig-1b]. Mantoux test was positive and histopathology showed epithelioid granuloma with epidermal hyperplasia [Table/Fig-3]. A diagnosis of lichenoid type of lupus vulgaris was confirmed and patient was

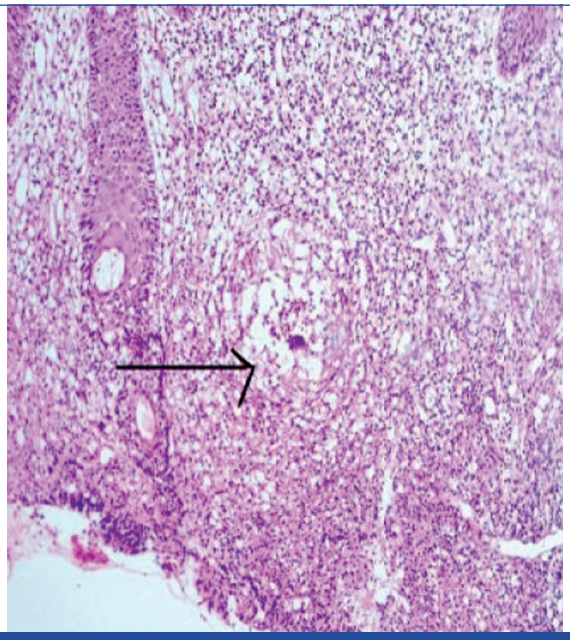


[Table/Fig-1]: a) Well-defined pigmented to erythematous scaly and mildly crusted plaque seen over dorsum of left hand; b) Well-defined pigmented plaque with mild scaling and crusting present over right side of chin; c) Well-defined pigmented plaque with scaling, crusting and oozing seen over left side of upper neck; d) Well-defined plaque with depigmentation in center and remaining pigmentation, atrophy at one end and hypertrophic at another, seen over right knee; e) Well-defined plaque with atrophic scarring in the center of lesion, greyish plaque with mild scaling and erythema on the surface over left thigh; f) Painful growth over nose and upper lip, having purulent discharge from the lesion.



[Table/Fig-2]: Case 1: Showing a tuberculoid granuloma (red arrow) with epithelioid cells surrounded by lymphocytes (H&E, 40x).

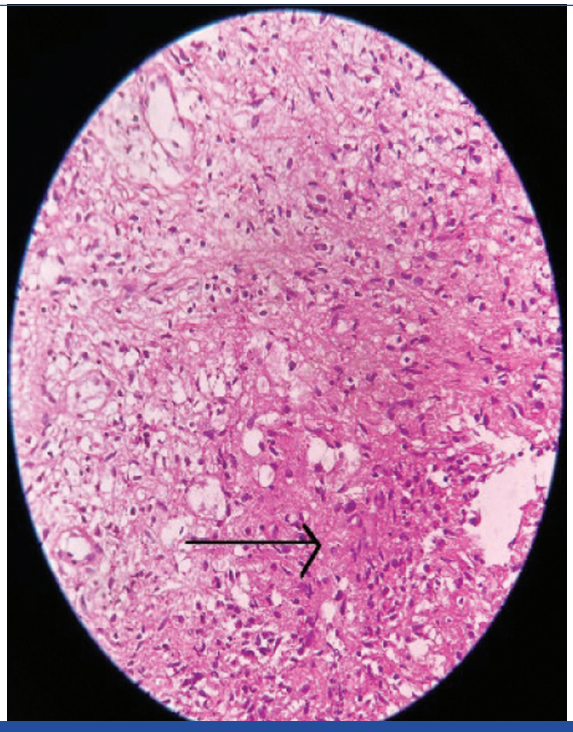
treated with anti-tubercular regimen, of nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg; ethambutol 275 mg. Patient is on regular follow-up and is symptomatically better. Improvement was seen after six to seven months.



[Table/Fig-3]: Case 2: Showing epithelioid granuloma (black arrow) with epidermal hyperplasia (H&E, 10x).

Case 3

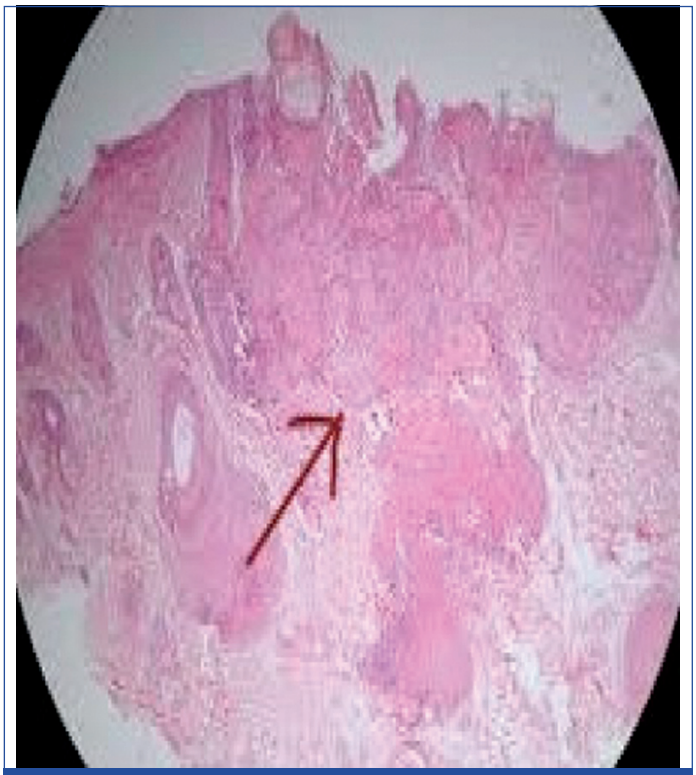
A 21-year-old female patient, a college student presented with a raised lesion over left side of upper neck since one year, gradually increasing in size. She did not give history of cough, fever, co-morbidities. On examination, well defined pigmented plaque with scaling, crusting and oozing was seen [Table/Fig-1c]. Mantoux test was positive. Histopathology showed presence of central necrosis and epithelioid granulomas surrounded by lymphocytes and located superficially in the dermis [Table/Fig-4]. A diagnosis of scrofuloderma was confirmed and patient was started on antitubercular regimen, of nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg; ethambutol 275 mg. Patient is on regular follow-up and was symptomatically better after six months of therapy.



[Table/Fig-4]: Case 3: Showing epithelioid granuloma(black arrow) with central histiocytes and peripheral lymphocytes (H&E, 40x).

Case 4

A 41-year-old male patient, a farmer by profession had raised lesion over right knee since two years, gradually increasing in size. He did not complain of pain or itching over the lesions. He gave history of trauma three years back. He did not give history of fever and joint pain. He did not give history of any co-morbidity. On examination, a well-defined plaque with depigmentation in center and remaining pigmentation, atrophy at one end and hypertrophic at another, seen over right knee [Table/Fig-1d]. Mantoux test was positive and histopathology showed epidermal hyperplasia, multiple non caseating granuloma with lymphocytes, epitheliod cells, langhans giant cells [Table/Fig-5]. A diagnosis of sporotrichoid type of lupus vulgaris was confirmed and patient was started on anti-tubercular regimen, of nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg; ethambutol 275 mg. Patient has completed the course of nine months of treatment and is on regular follow-up now. Lesions have resolved after nine months and patient is healthy.



[Table/Fig-5]: Showing hyperkeratosis, acanthosis, tuberculoid granuloma (red arrow) seen in the upper dermis (H&E, 10x).

Case 5

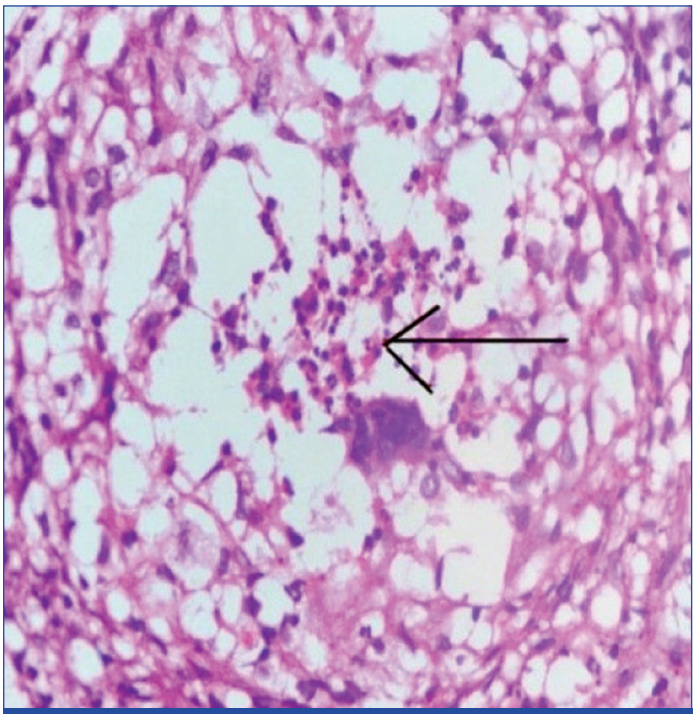
A 38-year-old male patient, a farmer by profession came with pigmented lesion over left thigh since one year, gradually increasing in size. He did not complain of pain or itching over the lesions. He gave history of trauma about one year back. He did not give history of fever or joint pain. He did not give history of any co-morbidities. On examination, there was a well-defined plaque with atrophic scarring in the center of lesion, greyish plaque with mild scaling and erythema on the surface [Table/Fig-1e]. Mantoux was positive. Skin biopsy was consistent with lupus vulgaris. He was further started on anti-tubercular regimen, of nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg; ethambutol 275 mg. Patient is on regular follow-up and is symptomatically better. Improvement was seen after six months.

Case 6

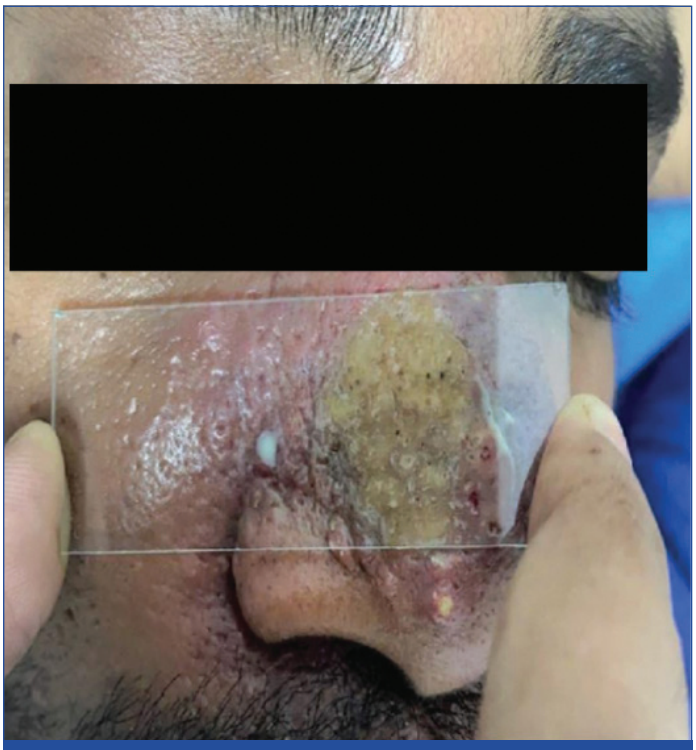
A 32-year-old male patient came with the complaints of red coloured painful growth over nose and upper lip since six months. The lesion was rapidly progressing and painful in nature. On examination, lesion was tender and soft to firm in consistency. Marked purulent

exudate was seen on palpation [Table/Fig-1f]. No evidence of lesions inside the nasal mucosa were present in the nasal cavity. Three enlarged submandibular lymph nodes were palpated which were firm, non matted, mobile, non tender. Mantoux test was positive and histopathology showed epitheloid granuloma with lymphocytic infiltrate and langhans giant cells [Table/Fig-6]. Diascopy showed apple jelly nodules [Table/Fig-7]. Dermoscopy showed yellowish whiten globules, white structureless areas and white scales [Table/Fig-8]. A diagnosis of hypertrophic type of lupus vulgaris was confirmed and he was started on anti-tubercular regimen, of nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg; ethambutol 275 mg. Patient is on regular follow-up and is symptomatically better. Improvement was seen after six months of initiation of the treatment.

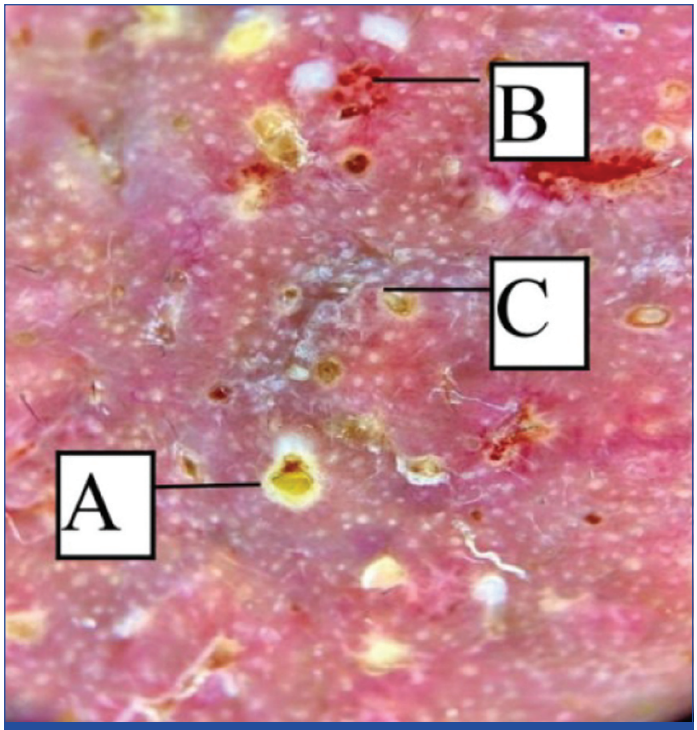
Findings of all the cases are described in [Table/Fig-9].



[Table/Fig-6]: Case 6: Showing epithelioid granuloma (black arrow) with multinucleated giant cells and lymphocytes (H&E, 40x).



[Table/Fig-7]: Diascopy showing apple jelly nodules.



[Table/Fig-8]: Dermoscopy showing (A) yellowish white globules, (B) white structureless areas and (C) white scales.

S. No.	Age/ Sex	Presentation	Diagnosis	Treatment	Follow-up
1	29 years/ male	Well-defined pigmented to erythematous scaly and mildly crusted plaque seen over dorsum of left hand	Keratotic lupus vulgaris	Nine months of rifampicin 150 mg; isoniazid 75 mg; pyrazinamide 400 mg; ethambutol 275 mg for all patients	Symptomatically better
2	36 years/ female	Well-defined hyperpigmented plaque with mild scaling and crusting present over right side of chin	Lichenoid lupus vulgaris		Symptomatically better
3	21 years/ female	Well-defined pigmented suppurative plaque with scaling, crusting and oozing seen. lymphadenopathy+	Scrofulo -derma		Symptomatically better
4	41 years/ male	A well-defined plaque with depigmentation in center and remaining pigmentation, atrophy at one end and hypertrophic at another, seen over right knee	Sporo-trichoid lupus vulgaris		Symptomatically better
5	38 years/ male	Well-defined plaque with atrophic scarring in the center of lesion, greyish plaque with mild scaling and erythema on the surface	Keratotic lupus vulgaris		Symptomatically better
6	32 years/ male	Hypertrophic growth over nose and upper lip, purulent discharge, tender and soft to firm in consistency. Lymphadenopathy + Diascopy showed apple jelly nodules	Hyper-trophic lupus vulgaris		Symptomatically better

[Table/Fig-9]: Table summarising the six different cases of the present case series.

DISCUSSION

Cutaneous TB presents with dermatological manifestations of tuberculosis. It is caused by bacteria *Mycobacterium tuberculosis*, *Mycobacterium bovis* and it can also be caused by the Bacillus Calmette Guerin (BCG) vaccination. Almost 1-1.5% of extrapulmonary tuberculosis comprises of cutaneous TB, which is manifested in 8.4-13.7% of all cases of tuberculosis [1]. These lesions can be acquired exogenously or endogenously. A widely accepted classification was proposed by Tappeiner and Wolff which was based on the route of infection [2]. Exogenous inoculation may leads to Tuberculosis verrucosa cutis (TVC), TB chancre, and some cases of Lupus vulgaris. Patients who were previously infected presented with endogenous infection by lymphatic extension (lupus vulgaris), haematogenous extension (miliary TB), or contiguous spread (scrofuloderma, orificial TB) [2].

Lupus vulgaris is a chronic form of cutaneous tuberculosis that is widely described with a multitude of presentations [3]. Common sites of involvement are head and neck in Western countries whereas in tropical and subtropical areas, common sites are lower extremities or buttocks. In the present case series, the sites involved were forearm, neck, knee, thigh and nose. Morphologically, they are reddish brown lesions which are small, solitary, sharply defined and nodular [3]. The different clinical types of Lupus vulgaris are

1. Classic plaque or keratotic
2. Hypertrophic
3. Ulcerative
4. Vegetating

In a study, ulcerative type was the least common type of lupus vulgaris where ulcer was the main lesion [4]. This was consistent with the present study where keratotic type was the most common and the least common was ulcerative type.

On dermoscopic examination, plaque type has a classic apple-jelly appearance [4]. Differential diagnosis of lupus vulgaris can be other forms of cutaneous TB, deep fungal infections, leishmaniasis, sarcoidosis, hypertrophic lichen planus, lichen simplex chronicus, blastomycosis. Lesions on the nose can mimic lepromatous leprosy, Wegener's granulomatosis and syphilis [5]. We have reported two cases of keratotic type and one of hypertropic, lichenoid and sporotrichoid type which responded well to multidrug therapy.

Scrofuloderma present as red-brown nodules which are firm, painless, subcutaneous, that overlies an infected focus [6]. It gradually enlarges into suppurative ulcers and draining sinus tracts. Skin biopsy shows wedge-shaped necrosis with tuberculoid granuloma. The predilection for scrofuloderma is usually on the neck, axilla and supraclavicular [7]. The present case presented with a suppurative purulent nodule with crusting over the neck and pus emerged from the sinus when pressed. The diagnosis of present case was consistent with scrofuloderma. Differential diagnoses of scrofuloderma can be considered as gummous and fistulous diseases, such as tertiary syphilis, paracoccidioidomycosis, actinomycoses, hidradenitis suppurativa and lymphogranuloma venereum [7-9]. Differential diagnosis of the individual cases is shown in [Table/Fig-10].

The TVS occurs in people who were previously infected after direct inoculation of TB into the skin. It presents as non tender solitary, purplish or brownish-red warty plaque with central atrophy [10]. As differential diagnosis, we can consider diseases with verrucous lesions such as, leishmaniasis, keratoacanthoma centrifugam, verruca vulgaris, tuberculosis verrucosa, hypertrophic lichen planus, sporotrichosis [11].

Case No.	Diagnosis	Differential diagnosis
1	Keratotic lupus vulgaris	Other forms of cutaneous TB, deep fungal infections, leishmaniasis, sarcoidosis, blastomycosis.
2	Lichenoid lupus vulgaris	Hypertrophic lichen planus, lichen simplex chronicus
3	Scrofuloderma	Tertiary syphilis, paracoccidioidomycosis, actinomycoses, hidradenitis suppurativa
4	Sporotrichoid lupus vulgaris	Deep fungal infections, leishmaniasis, sarcoidosis, blastomycosis
5	Keratotic lupus vulgaris	Lepromatous leprosy, hypertrophic lichen planus, lichen simplex chronicus, leishmaniasis, sarcoidosis, blastomycosis
6	Hypertrophic lupus vulgaris	Lepromatous leprosy, Wegener's granulomatosis and syphilis

[Table/Fig-10]: Table summarising the differential diagnosis of the individual cases.

Tuberculidsoccur in patients with a moderate to high degree of immunity due to previous infection. It can be classified as:

1. Papulonecrotic tuberculid;
2. Erythema induratum of Bazin (EIB); and
3. Lichen scrofulosorum (LS) [10].

Cutaneous tuberculosis may differ in histopathological appearances, in general showing granulomas with epitheloid, mononuclear, plasma and langerhans cells [11]. All other present cases showed granulomas in histopathology.

Treatment for cutaneous tuberculosis is the multidrug therapy which consists of two months of intensive phase (R:Rifampicin; H: isoniazid; Z: pyrazinamide; E: ethambutol) and four months of maintenance phase (Rifampicin and Isoniazid) [12]. The same treatment was given to all cases, discussed here and they have been improving symptomatically.

CONCLUSION(S)

It is imperative that cutaneous tuberculosis be considered in patients presenting with atypical skin lesions which may be suspected for an underlying infectious etiology. Physicians should have a high index of suspicion in order to effectively diagnose and treat these conditions which can turn out to be substantially morbid. This case series demonstrates the importance of diagnosing cases of cutaneous tuberculosis in patients presenting with a suspicious skin lesion. Diligent laboratory and diagnostic testing should be done to determine the etiology.

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PARTICULARS OF CONTRIBUTORS:
1. Assistant Professor, Department of Dermatology, Venereology and Leprosy, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.
2. Senior Resident, Department of Dermatology, Venereology and Leprosy, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.
3. Professor, Department of Dermatology, Venereology and Leprosy, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.
4. Junior Resident, Department of Dermatology, Venereology and Leprosy, Sree Balaji Medical College and Hospital, Chennai, Tamil Nadu, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Ashok N Kumar,
Professor, Department of DVL, Sree Balaji Medical College and Hospital, #7 CLC Works Road, Shankar Nagar, Chromepet, Chennai-600044, Tamil Nadu, India.
E-mail: drashokkumar25@gmail.com

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