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Infectious Skin lumps: Digging the Organism Under Microscope

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Abstract

The skin, subcutaneous tissues, deep fascia and muscle might get involved by a wide range of infections. Depending on the causative organism including bacteria, fungus, virus or a parasite there may be a myriad of clinical presentation of skin and soft tissue infections (SSTI's), making a comprehensive diagnosis difficult (1,2) This case series presents three enlightening clinical scenarios which may help in increasing awareness among clinicians along with pathologist to tackle such mysterious skin lumps. Moreover, at times routine laboratory and radiological investigations don't contribute much to clinch the diagnosis and microscope remains the sole tool.

Keywords: NIL

Introduction

The skin, subcutaneous tissues, deep fascia and muscle might get involved by a wide range of infections. Depending on the causative organism including bacteria, fungus, virus or a parasite there may be a myriad of clinical presentation of skin and soft tissue infections (SSTI's), making a comprehensive diagnosis difficult (1,2) This case series presents three enlightening clinical scenarios which may help in increasing awareness among clinicians along with pathologist to tackle such mysterious skin lumps. Moreover, at times routine laboratory and radiological investigations don't contribute much to clinch the diagnosis and microscope remains the sole tool.

Case Series :

Case 1

A 22 years old young vegan female, resident of Dehradun, Hindu by religion presented to Surgical OPD with complaints of progressively increasing upper back painful swelling since past two months associated with episodes of fever. Past and personal history is insignificant.

General condition was fair with stable vitals. Systemic examination was within normal limits. Local examination of upper back revealed a nodular, firm, tender, non-fluctuant and non-reducible swelling with overlying normal skin .

A provisional diagnosis of Fibrolipoma was made. Ultrasound showed an oval cystic lesion measuring approximately 1.0x0.5 cm in the underlying muscle layer with no internal vascularity or calcifications. Patient underwent surgical excision of lump which was sent for histopathological examination.

We received multiple tissue pieces together measuring 1.5x1.0x0.5 cm. Microscopic examination shows fibromuscular tissue pieces exhibiting cystic cavity lined by duct like invaginations, filled with proteinaceous fluid and cell debris. Surrounding tissue shows chronic lymphoplasmacytic infiltrate along with histiocytes, occasional multinucleate giant cell and cholesterol clefts. Findings were indicative of parasitic infestation with Cysticercus [Figure 1].

Following an unexpected diagnosis of isolated cysticercus infection, NCCT head was adviced which fortunately turned out to be a normal scan.

Case 2

A 50 years old female, farmer by occupation, resident of Uttarkashi presented to Surgical OPD with complaints of lump on left foot since past two years which is now increasing in size and progressively becoming painful. There is no h/o fever, local trauma, diabetes, tuberculosis or any other chronic illness. General and systemic examination was within normal limits. Local examination showed subcutaneous lump over left foot with overlying skin redness measuring approximately 2.5x2.5cm [Figure 2]. On FNA from the lesion, sticky pus like material was aspirated. Cytological examination revealed dense mixed degenerated and viable inflammatory infiltrate comprising of polymorphs, lymphocytes and fair number of histiocyes showing significant phagocytosis with an occasional scattered giant cells. However no epithelioid cell granuloma, fungal element or any atypical cell was noted in the smears examined. ZN stain did not demonstrate Acid fast bacilli. X-ray foot did not revealed any bony involvement. Since there was insignificant improvement following antibiotic therapy, patient underwent surgical excision of the lump.

We received greyish white tissue piece measuring 3.5x2.0x1.0 cm. Microscopic examination shows fibrocollagenous tissue piece exhibiting a cystic cavity containing basophilic filamentous bacterial aggregates with scant proteinaceous fluid surrounded by dense mixed inflammatory infiltrate and sheets of foamy macrophages in a background having occasional multinucleate giant cells and cell debris (Splendore- Hoepple phenomenon). Hence with the above histopathological findings a diagnosis of Actinomycetoma was rendered [Figure 3].

Case 3

A 38 years old male, resident of Dehradun, presented to Dermatology OPD with complaints of multiple lesions on face, back and extremities since 3- 4 months. There was no associated fever or any other chronic past illness.

On examination, General condition was fair. Local examination shows multiple skin colored firm, nodulo-papular, shiny lesions of variable sizes over face, back and bilateral extremities [Figure 4]. However there was no loss of sensations. Differential diagnosis included Hansens disease, Reticulohistiocytosis and Lipoid proteinosis.

Skin punch biopsy was sent for histopathological examination.We received single tiny tissue piece measuring 0.5x0.3x0.2 cm. Microscopic examination shows subepidermal bit exhibiting sheets of epithelioid like cells and fibrohistiocytic clusters along with few scattered lymphocytes lying amidst a background having unremarkable hair follicles and sebaceous glands [Figure 5]. Wade Fite Faracco stain demonstrated stacks and globi of lepra bacilli [Figure 6]. A conclusive diagnosis of Histoid leprosy was made.

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Fig.1 High power view (40x) showing duct like invaginations of cysticercus cellulosae with surrounding host tissue reaction (H& E)

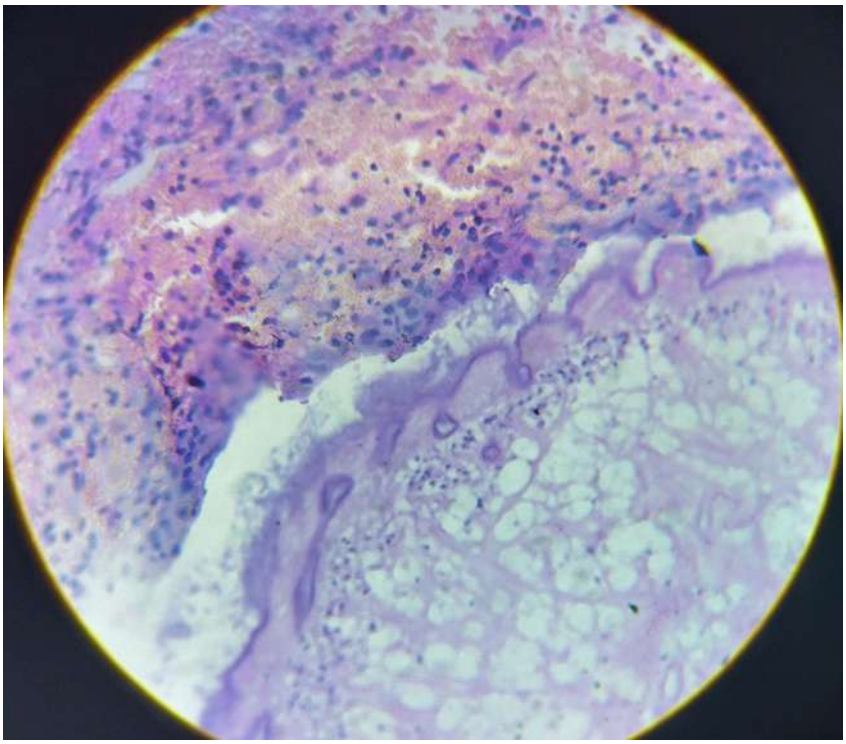

Fig.2 Left foot lump

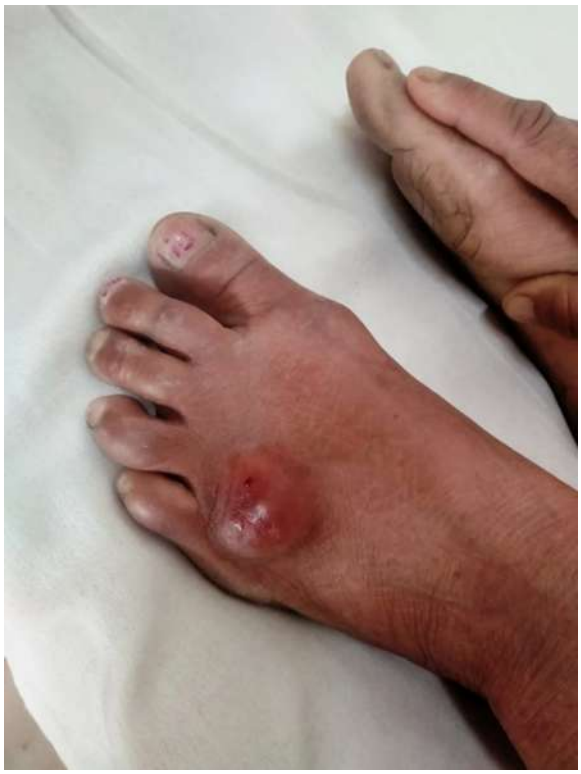

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Fig.3 Low power view (10x) showing basophilic filamentous bacterial aggregates surrounded by dense mixed inflammatory infiltrate (H&E)

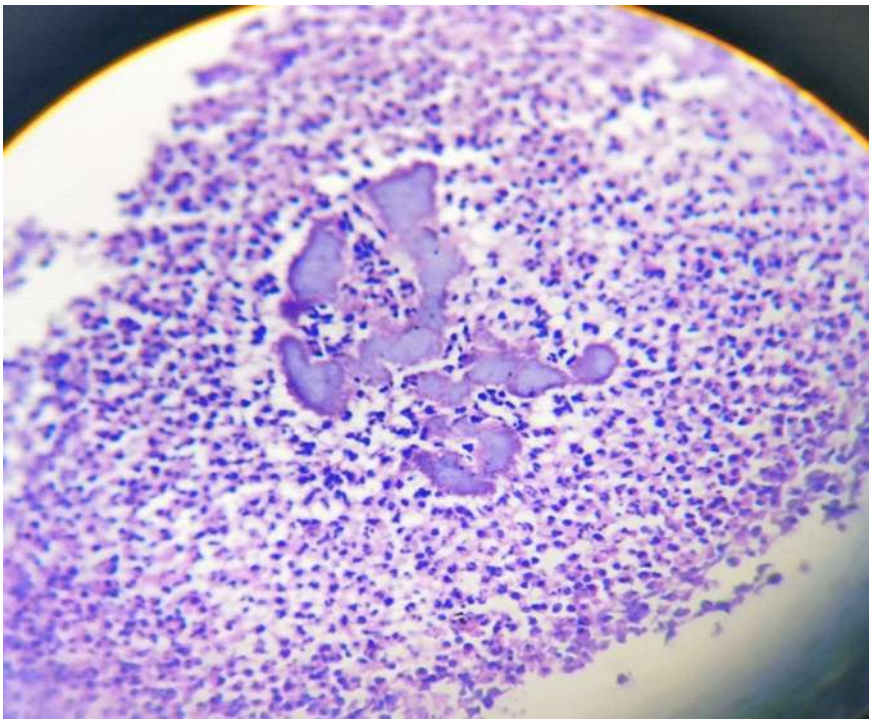

Fig.4 Multiple firm, skin colored, nodulo-papular, shiny lesions

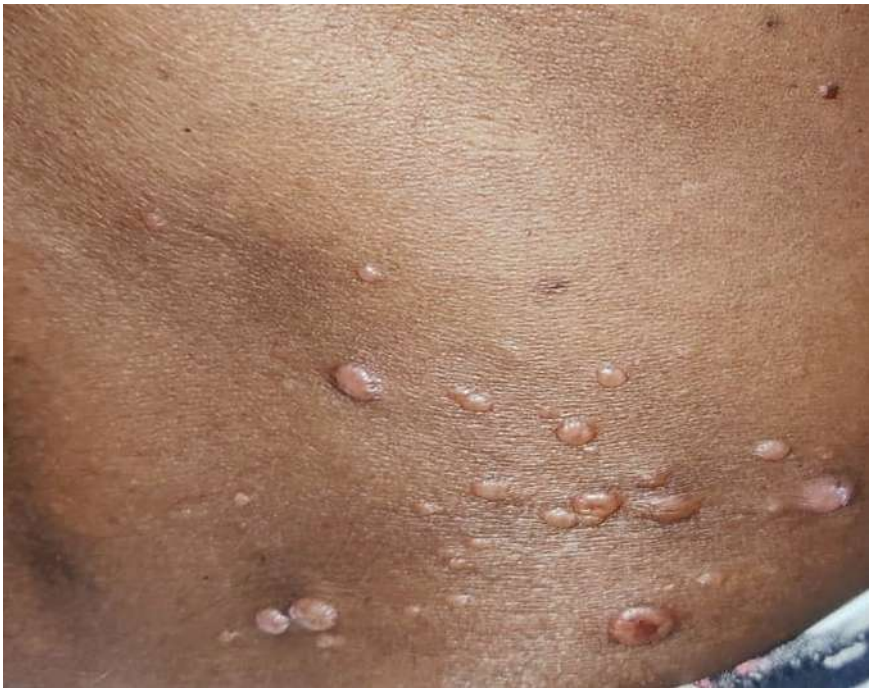

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Fig.5 Low power view (10x) showing subepidermal tissue exhibiting sheets of epithelioid like cells and fibrohistiocytic clusters (H&E)

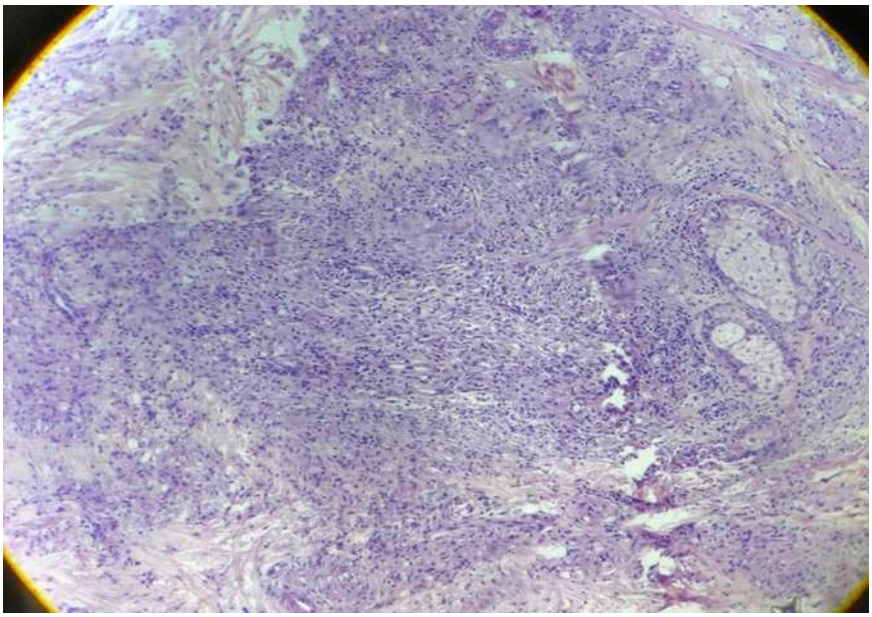
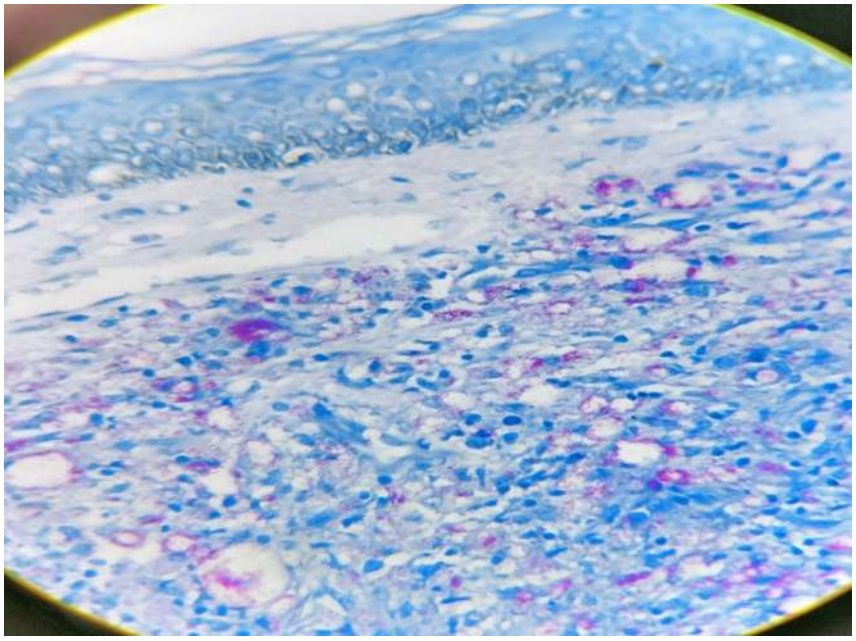


Fig.6 Wade Fite Faracco stain demonstrating stacks and globi of Lepra bacilli



Discussion :

SSTI 's are one of the major causes of morbidity and mortality globally. India is the second most populated country in the world with diverse culture, religious practices, literacy rates, food habits and socio-economic conditions (3)

The aetiology of SSTI' s can vary with numerous possible causative pathogens.

It is a challenging entity for the clinician in his daily practice and unfortunately the most misdiagnosed.

A wide spectrum of parasitic infections can involve the skin and underlying subcutaneous tissues. Depending on the species of parasite the infection

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may be localised to the skin or the parasite may migrate to a specific target organ via blood stream, as in our first case. Isolated cysticercus was found to be affecting the subcutaneous tissue in back and surrounding skeletal muscle bundles.

Cysticercosis is a parasitic disease caused by accidental ingestion of cysticercus cellulosae, the larval form of taenia solium commonly known as pork tapeworm. Larvae after evagination in small intestine can pass into human bloodstream and lymphatic system. Although any part of the body can have cysticercosis but subcutaneous tissues, brain and skeletal muscles are most commonly affected (4). Diagnosis is made by identifying the larva microscopically after biopsy on histological section (5). It may be supplemented by serological tests and following calcification, these cysts may be identified on X-Ray, CT or MRI scans.

The deceptively innocent looking second case was a left foot lump appearing to be an abscess on FNAC, however persistence of lesion since 2 years in an immunocompetant individual and not relieved on antibiotic course raised the suspicion which was finally diagnosed as Mycetoma or 'Madura Foot' , a chronic granulomatous infection of skin and subcutaneous tissues caused by actinomycetes or filamentous fungi. It is characterized by triad of tumefaction of affected tissue, formation of multiple draining sinuses and presence of oozing granules (6). Its chronic and indolent course often resembles that of tuberculosis, fungal infection, malignancy and delays early diagnosis and treatment (7). Fortunately in the present scenario, a prompt local and detailed histopathological examination helped to diagnose this case of Actinomycetoma before development of discharging sinuses and any underlying bony involvement. This rarely encountered, clinically challenging entity usually masquerades its presentation due to chronicity or partial treatment. Hence a high index of suspicion in chronic non-healing skin lesions is advised to diagnose this infection (8).

Our third intresting case is of Histoid leprosy, a chronic granulomatous infection caused by Mycobacterium Leprae. Mycobacterial skin and soft tissue infection (SSTI) includes nontuberculous mycobacterial (NTM) infections, tuberculosis (TB), and leprosy. HL is a rare variant of multibacillary hansen's characterized by the presence of nodules and plaques in the skin or the subcutaneous tissues over an apparently normal skin with unique histopathological and characteristic bacterial morphology (9) Similar to the present case, the age at the time of diagnosis is mostly between 21 and 40 years, with a predilection towards male sex(10)

HL often present in patients who have lepromatous leprosy that either relapses after inadequate or irregular monotherapy treatment with dapsone, in dapsone resistant cases or, rarely, arise de-novo (10) as in the present case.

Classical histopathological findings include epidermal atrophy as a result of dermal expansion by the underlying leproma and an acellular band (Grenz zone) located immediately below the epidermis (11) Dermis consists of sheets of fusiform histiocytes in a whorled, criss-cross or storiform pattern containing abundant rod shaped bacilli. Apart from being a rare entity, the higher load of lepra bacilli in these cases makes it a concern as a reservoir for leprosy.

Surprisingly, in all the three cases reported neither routine laboratory nor radiological investigations proved to be much diagnostically helpful. Such cases may act as an eye opener for both clinicians and young pathologist highlighting the need for a watchful clinical scrutiny and extensive microscopic examination of such suspicious skin lumps.

Conclusion :

It is crucial to maintain a high index of suspicion for such above discussed SSTI's and be aware of possible presenting signs and symptoms. An early diagnosis may help preventing disease dissemination and avoid any further life threatening complications.

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