CRYOTHERAPY FOR TREATMENT OF SPOROTRICHOSIS: CASES OF COMPLETE CURE WITH PHYSICAL MODALITY ONLY

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**Key clinical message:**

Sporotrichosis is a subcutaneous fungal infection caused by various sporothrix fungus species. Cutaneous infection often occurs via inoculation of fungus into the intact skin due to traumatic skin injuries. Various cutaneous manifestations of sporotrichosis can occur ranging from those limited to skin with ulcero-nodular lesions along lymphatics to systemic dissemination to lungs and meninges rarely. Localized form of cutaneous sporotrichosis occur in those with high degree of immunity, whereas the systemic disseminated forms occur in immunocompromised individuals. Treatment of sporotrichosis is done with prolonged oral and systemic antifungals for months until clinical recovery. However, this prolonged dosing until clinical recovery can be hazardous to those with hepato-cardiac comorbidity and also in pregnant females. Given the systemic side-effects that can underly the use of antifungals for prolonged duration, treatment should be sought towards isolated physical modality only which are devoid of systemic side effects. Here we report two cases- one fixed cutaneous form and other lymphangitic form of sporotrichosis, treated successfully with physical modality of treatment i.e., cryotherapy with complete cure after 4-5 sessions.

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Case Reports:

BACKGROUND

Sporotrichosis is one of the common forms of subcutaneous mycosis, caused by various species of sporothrix fungus.1 Sporotrichosis has been reported from various regions of Nepal since years.2 However the occurrence is not very common and largely limited to tropics and the subtropics.1 Sporotrichosis is mostly confined to skin, lymphatics and subcutaneous tissue, unless in those who are severely immunocompromised, who inhale the fungus to lungs and can progress to systemic involvement of meninges and joints rarely.3 Cutaneous manifestations of sporotrichosis are largely divided into the lymphangitic form and the fixed form. Among these, the commoner form involving the lymphatics occurs via direct inoculation of sporothrix via traumatic skin injuries, predominantly over exposed skin sites- upper extremity.4 lesion can also be fixed and localized to face, neck and extremities.5 Presence of disseminated systemic sporotrichosis is a rare finding and its occurrence in those without underlying immunocompromised status is even rarer. However, few disseminated cases in immunocompetent individuals are not uncommon.6 The common lymphangitic form presents with ulcero-nodular lesion with purulent discharge along with tender regional lymphadenopathy over extremities mostly unilateral and rarely bilateral.7 Cutaneous sporotrichosis rarely occurs via systemic dissemination of disease as a part of widespread systemic spread to viscera including the skin, especially in those who are severely immunocompromised.8 This etiological association with the underlying infectious foci has led to the systemic screening in lungs, brain and joints for underlying infection in those with cutaneous manifestation.3 As there’s possibility of prolonged use of over the counter antifungal medication, lack of regular follow up and lack of laboratory monitoring, especially in the rural parts of Nepal, therapy should be tailored towards onsite physical treatment with cryotherapy, which can be cheap and without systemic side-effects useful in those with cardio-hepatic comorbidities and also in pregnant females. As there’s lack of availability of culture media and fluorescent microscopes in rural parts of Nepal, diagnosis relies on a vigilant clinical eye and good histopathological section.9 The histopathology of sporotrichosis which is usually helpful, shows epidermal hyperkeratosis, acanthosis with dermal granuloma and neutrophilic abscess. Occasionally, cigar shaped fungus with asteroid bodies is seen.10 Given the systemic organ related side effects that underlies prolonged treatment of this chronic granulomatous fungal infection, treatment should be focused towards physical modality- cryotherapy with greatest therapeutic benefit, complete cure and devoid of systemic side effects especially in rural Nepal where drug overuse is often an issue.11 Here, we report rare cases of cutaneous sporotrichosis treated with 4-5 weekly cycle of cryotherapy with freeze duration ranging from 15-20 seconds with complete cure seen post treatment and no recurrence till date.

OBSERVATION

Case 1: (Lymphangitic form)

A 32-year-old male patient from Kavre, Nepal, civil engineer by occupation, presented with discrete plaques over left forearm and index finger in a linear distribution for 5 months. Lesion started as an asymptomatic pea sized nodule over lateral part of left index finger. Patient has repeated field work with frequent outdoor activities, but denies any sorts of trauma to lesion site. Over period of 2 months existing lesion evolved into plaque with occasional oozing and pus discharge, and also new nodules evolved over forearm and index finger. He used to take over the counter topical and oral antibiotics from pharmacist nearby. On examination, multiple plaques and nodules were present over left lateral forearm and index finger in a linear distribution. Largest erythematous plaque with central crust was present over proximal aspect of left lateral index finger. Also spontaneously healed lesion with central atrophy and hyperpigmentation was seen over nearby lesion of disto-lateral forearm (Figure 1-2). There was no visible pus discharge or ulcer. Biopsy was done which showed epidermal hyperkeratosis, acanthosis with dermal granuloma and neutrophilic abscess. Few oval spores and multinucleated giant cells were also seen in the dermal granuloma suggestive of Sporotrichosis. Patient was insistently reluctant to any sorts of oral medication due to previous drug reaction 1 year back from oral medication, and oral itraconazole and potassium iodide were deferred. Patient was started on liquid Nitrogen cryotherapy 2 cycles of 20 second freeze and 10 seconds thaw every week for 4 weeks and the extension of lesion was halted with only residual pigmentation without active disease post treatment. There was complete cure of the disease post treatment with no recurrence till date. New lesions have not evolved for 1 year now and the lesion has healed with no symptoms and minimal pigmentation.



Figure 1: Sporotrichoid linear pattern of nodulo-plaque lesion of left lateral forearm and index finger treated with four sessions of cryotherapy.



Figure 2: Zoomed in plaque of sporotrichosis of same patient after 1 months of weekly cycle of Cryotherapy, residual halo of post inflammatory hyperpigmentation seen post therapy.

Case 2: (fixed form)

A 40-year-old male patient from Dhading, Nepal, farmer by occupation, presented with solitary linear plaque over left lateral hand for 8 months. Lesion started as an asymptomatic pea sized nodule over lateral part of left hand. Patient had history of trauma with sickle while cutting grass 5 months prior to onset of lesion. Over period of 4 months lesion evolved from the site of scar into plaque with occasional oozing and pus discharge. On examination, well defined erythematous infiltrated linear plaque was present over left lateral hand with scales and crust over the surface. (Figure 3). There was no visible pus discharge or ulcer. Biopsy was done which showed dermal granuloma with neutrophilic abscess. Few oval spores and multinucleated giant cells were also seen in the dermal granuloma suggestive of Sporotrichosis. Patient was a chronic alcoholic with Alcoholic liver disease, under treatment and oral itraconazole and potassium iodide were deferred. Patient was started on liquid Nitrogen cryotherapy 2 cycles of 15 second freeze and 10 seconds thaw every week for 5 weeks and the extension of lesion was halted with only residual pigmentation without active disease post treatment. There was complete cure of the disease post treatment with no recurrence till date. New lesions have not evolved for 1 year now and the lesion has healed with no symptoms and minimal pigmentation.



Figure 3: linear erythematous infiltrated plaque with scales and crust over surface, over site of scar, and on the right-side complete resolution of lesion post 5 sessions of cryotherapy.

DISCUSSION

Sporotrichosis is a subcutaneous mycosis caused by various species of sporothrix fungi.4 Sporotrichosis occurs when inoculation of fungi occurs via any sorts of trauma that affects intact skin.5 Also rarely, disseminated sporotrichosis with secondary spread over skin can occur, along with involvement of viscera such as lungs, meninges and the joints.8 Usually lesions are broadly classified into the commoner lymphangitic form and the rarer localized form. Localized lesion occurs in those with high degree of immunity. In localized form there’s containment of fungal pathogen within and there’s no dissemination into the lymphatics and the viscera.12 Disseminated Sporotrichosis involving multiple sites over trunk and extremities is a rare finding and even rarer is its occurrence in immunocompetent individuals.6 However, disseminated sporotrichosis can occur in those with immunocompromised status such as HIV or chronic alcoholics.13 Patients mostly present with nodulo-pustular lesion along the lymphatics, predominantly over upper extremity which is often a common site of trauma. Fixed form usually occurs localized, with infiltration, scaling and spontaneous healing in some.4 There are cases of sporotrichosis reported from different parts of Nepal, although the disease is more common in the tropics and the subtropics.2 Diagnosis can be made with good clinical acumen and histopathology. The histopathology of sporotrichosis shows epidermal hyperkeratosis, acanthosis with dermal granuloma and neutrophilic abscess. Occasionally, cigar shaped fungus with asteroid bodies is seen.10 Treatment of sporotrichosis is done with prolonged oral and systemic antifungals for months until clinical recovery.3 However, this prolonged dosing until clinical recovery can be hazardous to those with hepato-cardiac comorbidity and also in pregnant females. Given the systemic side-effects that underlies use of antifungals for prolonged duration, treatment should be sought towards isolated physical modality only which are devoid of systemic side effects. As there’s possibility of prolonged use of over-the-counter antifungal medication, lack of regular follow up and lack of laboratory monitoring, especially in the rural parts of Nepal, therapy should be tailored towards onsite physical treatment with cryotherapy, which can be cheap and without systemic side-effects. With proper diagnosis, overall prevalence of the disease can be estimated and clinical therapeutic trials can be performed with timely prevention of dreadful complications.

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**Data availability statement**

The data that support the findings of this study are openly available in Clinical Case Reports

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**Detailed author’s contribution**:

PP ,SP and SG contributed to the collection of data and the management of the patient. PP and SP wrote the initial draft of manuscript. PP, SP, SA, SG and PP revised and prepared the final version of the manuscript. All authors have read and approved the final manuscript and agree to take full responsibility for the integrity and accuracy of the work.

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