

## ORAL ISOTRETINOIN- A NEW VISTA FOR THE TREATMENT OF FISSURED SOLE: A CASE REPORT

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### PRESENTATION OF CASE

A 36 years old female patient (non-pregnant) presented to the Dermatology OPD of Himalayan Institute of Medical Sciences, SRHU, Dehradun, with bilateral fissure sole, with complaints of pain for the last 2 years. The fissures were not present in any other part of the body like palms, scalp or rest of the body. History of oozing, scaling, pain or itching from fissures was present but history of bleeding was absent from the fissures during the time of her presentation. We ruled out all the diseases causing peripheral neuropathies like leprosy, diabetes, etc.

### CLINICAL DIAGNOSIS

Fissured Sole

### DIFFERENTIAL DIAGNOSIS

- Tinea pedis
- Psoriasis
- Eczema
- Contact dermatitis

### PATHOLOGICAL DISCUSSION

Fissuring or cracking within the sole is a common clinical condition in tropical countries, it affects both the sexes. The extent of fissuring ranges from mild to severe form, and it causes pain, tenderness, oozing, and bleeding from the sole, which is very distressing to the patients. Cosmetically also, it is very annoying for the patients. Sometimes, it also serves as a gateway for the microorganisms, which leads to lymphangitis and cellulitis. Fissuring in the sole is most commonly observed among farmers and housewives. Barefoot walking is also a contributing factor for precipitating this condition.<sup>1</sup> Diseases causing autonomic and sensory neuropathy may also contribute to increased fissuring.<sup>2,3</sup> However, fissuring may also be seen in patients without any of the factors discussed above. As per the classification of

Sivakumar et al., our patient came under Grade-3 of fissured sole, as she presented with deep fissures. (1)

| Grading | Fissured Sole                                |
|---------|--|
| Grade 0 | No fissure                                   |
| Grade 1 | Minimal superficial fissures                 |
| Grade 2 | Fissuring condition in between Grade 1 and 3 |
| Grade 3 | Deep fissures                                |

**Table 1. Grading of Foot Fissures/Fissured Sole**

### DISCUSSION OF MANAGEMENT

Keratolytic drugs are commonly used for the treatment of fissured sole. It is a very common condition in tropical countries like India contributing to significant morbidity. Yet, we have very limited options for the treatment for fissured sole. The various treatment modalities have not been studied in detail.<sup>1</sup> In this case we describe our experience of successfully treating a case of fissured sole (Grade 3) with low dose oral isotretinoin.

We treated the patient with tablet Isotretinoin 20 mg once daily and followed her on a monthly basis for 3 months, after conducting appropriate investigations (complete blood count, liver function test, lipid profile) to rule out any pathology/abnormality. We did not apply any local keratolytic/conventional treatment to avoid any bias in our study results during the treatment period. We experienced excellent results (Figure-1 and -2) with isotretinoin therapy. The patient improved significantly from Grade-3 to Grade-1. Details of our observation are described in Table-2.



**Figure 1. Before Treatment**

**Figure 2. After Treatment**

| Skin Conditions | Visit at 1 <sup>st</sup> Month | Visit at 2 <sup>nd</sup> Month | Visit at 3 <sup>rd</sup> Month |
|-----------------|--------------------------------|--------------------------------|--------------------------------|
| Skin thickness  | +++                            | ++                             | +                              |
| Fissuring       | ++++                           | ++                             | NIL                            |
| Pain            | ++++                           | +++                            | NIL                            |
| Bleeding        | NIL                            | NIL                            | NIL                            |
| Itching         | ++++                           | +++                            | NIL                            |
| Grading         | III                            | II                             | I                              |

**Table 2. Follow Up of the Foot Fissure Case**

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Fissured sole is a very common phenomenon in tropical countries. In spite of that its aetiology, pathogenesis and treatment has not been studied extensively. Dryness of the skin may also aggravate this fissured sole. This can be correlated with the cracks found on the parched earth, during drought. Dryness causes a loss of cohesion between the corneocytes and the skins becomes less pliable to stretching and cracks develop over the sole.<sup>4</sup>

Lack of moisture in the stratum corneum results in Dry skin, for maintaining a normal texture of our skin, the water content of the stratum corneum must be greater than 10%.<sup>5</sup> If the water content is reduced from that critical value, our skin becomes too dry, and cracks develop. When the cracks converted to fissures into the skin, it gives rise to irritation, inflammation and itching. Palms and soles are more susceptible due to more exposure and the anatomical variation in regulating water loss.<sup>5</sup> Apart from that a higher percentage of neutral lipids and lower percentage of sphingolipids in the non-volar skin confer superior barrier properties. Unfortunately, the fat ratio present in our plantar surface is just opposite to it (it contains the highest number of sphingolipids) and plantar surface becomes the most permeable/soft surface.<sup>6</sup>

As per standard treatment protocol, fissured sole is usually treated by topical modalities like Whitfield's ointment, Jessner's solution, salicylic acid, urea, lactic acid, allantoin, glycolic acid, and trichloroacetic acid.<sup>6</sup>

When keratolytic like urea, lactic acid are applied to the lesion, it desquamates the skin on and around the lesion and shedding takes place. Keratolytics can also be used to soften keratin, as it helps to improve the skin's moisture binding capacity, which is essential in the management of any dry skin conditions.<sup>7,8</sup>

Isotretinoin belongs to the Retinoid class of drugs, which are derived from Vitamin A. Commonly, it is used in the treatment of severe acne, and also in many other dermatological entities like psoriasis, lichen planus etc. Its Mechanism of action involves the drug binding to the Retinoic Acid Receptors (RAR). This leads to regulation of cell proliferation and differentiation. It also exhibits an immunomodulatory and anti-inflammatory action by inhibiting the enzyme Ornithine Decarboxylase, resultantly decreasing keratinisation and synthesis of polyamines.<sup>9</sup>

There are many adverse effects of isotretinoin. It can interact with multiple drugs like steroids, anticonvulsants, or tetracycline antibiotics. It is also fetotoxic and contraindicated in pregnancy and lactating mothers.<sup>9</sup> To our knowledge, it is not mentioned in the medical literature the beneficial effects of low dose oral isotretinoin in the treatment of fissured foot. However, we experienced excellent results for the treatment of fissured sole in this case with low dose oral isotretinoin.

To conclude, oral isotretinoin is a newer/promising treatment modality in fissured sole, and it helps to overcome complications responsible for the development of fissures, if given under proper supervision.

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