SPECIAL SELECTION

Treatment of Distal Onychomycosis With Avulsion and Topical Antifungal Agents Under Occlusion

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REPORT OF CASES

A 28-year-old man presented with a history of progressive thickening and fragmentation of the left thumbnail over a period of about 1.5 years. Scaling of his left hand previously had been treated successfully with 1% ciclopirox olamine cream applied twice a day for 1 month, but the thumbnail showed no evidence of improvement. He had tried several over-the-counter products for fungus infections of the nail for varying periods of time without success. On physical examination, he showed dystrophic changes of the left thumbnail with subungual hyperkeratosis (**Figure**, left). The remainder of his skin examination was unremarkable. Hyphae were observed in scales removed from under the left thumbnail, and a culture yielded *Trichophyton rubrum*. He was unwilling to take oral medication but agreed to be treated with nail plate removal followed by the topical application of an antifungal agent under an occlusive dressing.

THERAPEUTIC CHALLENGE

Distal onychomycosis of the nails is ordinarily treated by systemic antifungal agents,[1-3] since topical preparations have not proved to be effective[4] with the dermatophytes. Many patients, however, because of concerns of toxic effects, are unwilling to take oral antifungal agents for the many months of treatment required to ensure successful results, especially when only a few nails are affected. Complete or partial removal of the nail plate by surgery or chemical treatment has not been shown to unequivocally shorten the period of treatment. Furthermore, it does not, on its own, result in a cure.

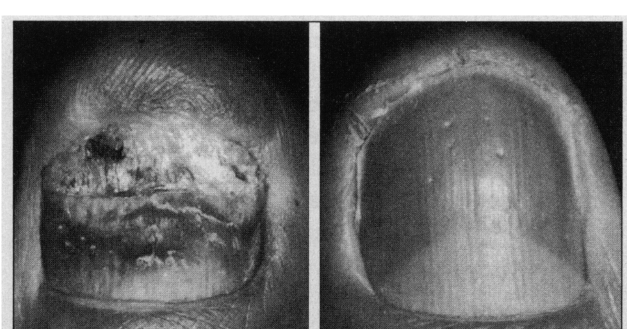
SOLUTION

Avulsion of the nail plate followed by a topical antifungal agent under an occlusive dressing was a useful therapy in this case (Figure, right) and in our series of cases. Our findings are supported by a report that appeared in the podiatry literature[5] during the course of our treatment.

METHODS

Eight otherwise healthy patients were offered the treatment of nail removal and topical antifungal agents because they refused oral drug therapy. The nail(s) to be treated had been affected for several years. Topical therapy with over-the-counter and prescription antifungal creams and lotions had been tried without success. There were six patients with a single fingernail involved, five whom had one or more toenails affected. The right thumb was involved in three patients, the left thumb in two patients, and the third right nail in one patient. One patient had the first right toenail involved and a second patient the first, fourth, and fifth toenails of the right foot. The diagnosis of fungus infection was established by finding hyphae in scales from under the nail and a positive culture, with *T rubrum* isolated in all cases.

The nail was removed by the distal method as previously described.[6] Monsel's solution was used to control bleeding, povidone-iodine (Betadine) ointment was applied to the nail bed, and a small square of gauze was used as a cover. The patient was told to change the dressing daily by soaking off the old dressing, drying, reapplying the ointment, and covering with gauze. After 3 to 4 days, depending on the degree of discomfort, the patient was instructed to apply 2% ketoconazole cream (five



Apearance of the thumbnail before (left) and 1.5 years after (right) treatment with 2% ketoconazole cream under an occlusive plastic dressing. The patient kept the nail clipped short to prevent a habit of nail biting, which may account for the few pits. Scrapings and cultures were negative for fungi.

patients with fingernails) or 1% ciclopirox olamine cream (three patients) twice a day and cover with a gauze pad. The cream was not forced under the fold. At 1 week after the procedure, six patients were instructed to apply the cream and cover the area with Actiderm or Duoderm overlapping so that the dressing could adhere. The dressing would remain in place for 3 to 4 days, and then the process was repeated after cleansing with water and drying. We treated a single fingernail in two patients using 2% ketoconazole cream with Actiderm followed by a plastic wrap after the second week. When seen at 6 weeks, the patients admitted to becoming more lax in the length of application, with overnight use being more common. Occlusion under plastic wrap was adopted by all patients at this time. Visits were scheduled at about 2-month intervals, and patients were encouraged to keep up treatment until the nail was long enough to require clipping (at least 6 months) and were advised to apply the cream nightly for a total of 1 year.

RESULTS

All patients with fingernail involvement, irrespective of the method of occlusion, grew out what appeared to be a normal nail by 6 months. The patients had no problems with the treatment except for some discomfort for the first few days. Overnight use tended to be the rule by 4 weeks of treatment. Scrapings were negative from the nail bed at all visits. At 1.5 years (Figure, right), all patients were free of disease as judged by appearance, scrapings, and culture. Patients with toenail involvement took about 10 months for the big toenail to grow completely out but were free of disease at 1.5 years.

Three additional patients with nail involvement were treated by trimming the nails as short as possible and using 2% ketoconazole cream with the occlusive dressing. After 2 months, the nails were grossly involved and the scrapings contained hyphae.

COMMENT

The treatment protocol developed in this report was based on prior experience that removal of the nail with distal onychomycosis followed by application of an antifungal agent without occlusion resulted in treatment failure in more than half of the patients (unpublished experience). Examination of the nail plate revealed that the fungi were present more proximally in the nail plate as revealed by histologic examination than was apparent on gross inspection of the plates. In several patients in this report, fungi could be detected in the plate under the nail fold. It was felt that higher tissue levels of antifungal agents would be achieved as a result of more complete penetration that would result from use of an occlusive dressing. This would be particularly important for eliminating organisms under the fold early in the course of treatment before the nail plate grew out. We found that ciclopirox olamine worked as well as ketoconazole, which was the drug used in the previous report.[5] Presumably other agents will be effective.

Unfortunately, trimming back the nail plate and using a topical drug under an occlusive dressing was not successful, but this would be expected from the histologic findings. To date, there have been no reports of any drug applied to the nail resulting in clinical and mycological cure.[7] One limitation of this technique is treating nails that have been affected for some time and where there is elevation of the skin at the distal end of the digit. After removal of such nails, the plates are unable to grow over the hump, and a distal paronychia results. This more commonly occurs in the feet than in the hands, but it can occur in the thumbs.

The technique described in this article offers treatment for a select group of patients. When new agents that can be used for shorter periods of time and have fewer toxic effects are available,[8] such treatment may appear more attractive.

Selected from Arch Dermatol. *1994; 130:558-559. The Cutting Edge.*

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