Treatment of Podoconiosis With Complicating Polyinfections Within Rural African Villages: A Case Study

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Abstract

This case study aims to provide a treatment plan for the treatment of podoconiosis with complicating polyinfections in a resource poor setting. A second objective is to help healthcare providers teach preventive measures to villagers in affected regions.

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Introduction

During a 10-day medical service-learning trip to Mufindi, Tanzania, a seventeen-year-old boy presented with a severely advanced stage of podoconiosis and multiple comorbid infections.

Case Presentation

An ill-appearing 17-year-old male arrived at the clinic site via automobile and was met behind the clinic due to his severely impaired ambulation resulting from advanced podoconiosis. He walked with such a degree of difficulty that even while using a cane, he was unable to reach the registration area. Medical students staffing the clinic assisted him to an exam room and subsequently to the treatment area.

Past medical history included a diagnosis of HIV at age 6, for which he was seen regularly in the local HIV clinic. Upon physical exam, he was found to have a full body fungal infection, tinea cutis, and suspected whitlow's warts on the hands and forearms bilaterally (see attached figures). His podoconiosis had progressed such that the affected areas extended to the midcalf, and the fungal infections on his lower extremities covered from his feet almost to his knees bilaterally. With the patient's permission, photographs were shown to a dermatopathologist in the United States for confirmation of our field diagnosis due to an absence of laboratory or other investigative techniques.

Management and Outcome

Treatment was started by soaking each foot in containers filled from 20L of boiled water treated with 20mL of a 5% bleach solution mixed with 8 ounces of a providone-iodine solution. Each lower extremity was then scrubbed with two providone-iodine surgical scrub brushes to remove the most superficial fungus and debris. Once dry, antifungal cream, Clotrimazole, was spread from the feet to the area extending just beyond the areas affected by the fungal infection. Finally, each foot was wrapped with rolls of gauze, then a roll of Ace bandage, and then placed within a sock.

With the use of an interpreter the patient and his father, who was his caregiver, were instructed how to care for his feet and legs. They were instructed to keep his feet covered at all times except for when bathing and changing the dressings. As the patient was undergoing treatment, the medical students providing his care explained each step of the process of caring for his wounds with the help of an interpreter. He was asked to perform home-care including changing his dressings once over the weekend before attending clinic again the following week if he was able. It was unclear if the patient would be able to arrange for transportation to the clinic a second time, and it was expected that the treatment would provide marginal relief of swelling-associated discomfort. The patient was provided with enough materials to complete several dressing changes and told to use each set once before discarding it, and that if he was going to use reusable bandages in the future, they were to be thoroughly cleaned between uses.

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Griseofulvin was provided to treat the tinea cutis, and ibuprofen was provided for pain relief at the clinic and to take before wound care activities were conducted at home. He had completed a seven-day course of amoxicillin provided by his HIV clinic prior to arrival at the clinic. Given our suspicion that his pathologies were environmental, fungal and viral in nature and his recent completion of an antibiotic regimen we elected not to provide additional antibiotic treatment. Through our interpreter we provided instructions in taking each medication and had the patient teach us how each medication would be used.

The patient returned to the clinic two days later for another round of treatment. He was no longer using a cane to walk, and his feet had reduced approximately one fifth in size. He also reported feeling less pain with each at-home wash. When he was washed for the second time in the clinic, using the same protocol as before, large pieces of infected skin were removed from his feet and lower legs bilaterally.

Discussion

Podoconiosis, commonly called mossy foot, is a form of elephantiasis which affects many individuals within rural African populations. It is characterized by lymphatic dilation and edema due to exposure to irritants within the soil. A lack of preventative education and continuous exposure to risk factors encourages disease progression, causing pain, walking difficulties, and ostracism of affected individuals. Many of the areas in which podoconiosis can be found [1] have been affected by high prevalence of HIV [2]. We theorize that the lymphatic stasis resulting from podoconiosis compounded this patient's immunocompromised status leading to an exacerbation of his concomitant lower extremity fungal infections. At baseline, this patient was already at higher risk for infection due to his HIV+ status. Blockage of lymphatic drainage as well as the prolonged irritation created an environment ideal for the proliferation of pathogenic organisms.

As with most global health encounters in sporadic, service-learning traveling clinics, the patient was provided with the available materials and the understanding that individuals staffing the clinic may never see the patient again. The team was delighted to see that the patient not only returned to clinic for a follow-up appointment, but also that he was able to walk, albeit with difficulty, to the registration area and to the treatment room without any form of assistance.

Several factors likely contributed to the success of the treatment plan in this case. The patient was of a higher socioeconomic status when compared to other members of his community, as was evidenced by his clothing, the use of a privately hired van, and his ownership of a cell phone. This likely contributed to his and his father's health literacy, which was higher than many individuals seen at the traveling clinics. This family was able to purchase medications and brought containers of recently completed courses of treatment so that the practitioners in the clinic knew the exact compounds and doses that had been taken. They brought all of the health records that they had, which showed years of treatment and strict adherence to recommended treatment plans.

Despite years of regular exposure to healthcare, there were gaps

in basic health knowledge, such as best practices for personal hygiene, including how to care for wounds and not to reuse wound dressings. Addressing these gaps played a key role in the success of our treatment plan. The nature of his condition and treatment were time consuming, which allowed for extra time to communicate with the patient. The students provided thorough instructions, had the patient and his father teach the instructions back, and encouraged questions. The importance of using water that had been boiled was emphasized as there is no sanitation system for the local water supply. Socks and bandages to cover the feet were provided along with instructions to avoid contact with soil. This reduced the risk of introducing additional irritants or contaminants to the treated areas.

The interventions implemented were low cost and very effective. The improvement in the patient's condition was striking; the increase in his quality of life was evident even before the medical interview began. Addressing gaps in health literacy should be prioritized in order to best manage chronic and environmentally-driven conditions such as podoconiosis. We hypothesize that even in the absence of the materials brought to clinic by the student team, the patient will still receive some benefit from the foot hygiene practices included in his treatment protocol. By using the student treatment as a demonstration, the patient was taught how to better manage his condition and prevent new exposure/reoccurrence while at the same time addressing his chief complaints. Students staffing the clinic were trained in using interpreters for successful medical communication. Students confirmed understanding of the instructions and educational items that were the focus by having the patient and his father "teach-back" the information they had learned. Improvements were observed in the patient's condition following the newly established home-care protocol; although it was unclear how much of this was due to the treatment provided in clinic and how much was due to improved home care. Increasing the amount of education provided did not increase the cost of care, and as wound debridement and addressing concomitant infections is time-consuming there are gains to be made by using the large amount of time spent with patients to address both the immediate medical concern as well as the sociocultural determinants of health.

Conclusion

This in-depth case study aims to teach doctors and other healthcare providers traveling to rural African areas how to treat podoconiosis along with complicating polyinfections. It also supports the importance of teaching villagers preventative healthcare measures. Increased education, especially coupled with improved access to socks and footwear, as well as healthcare, may reduce the prevalence of the disease.

Notes on patient consent

Informed consent of the patient's father and assent of the minor subject were obtained with the assistance of an interpreter.

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References

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Figures 1-3 Patient Day 1: Before treatment images of patient

Figures 4-6 Patient Day 2: Post initial treatment images of patient