

## Nursing Care on an Elderly Diabetic Foot Patient with an Abnormal Toenail: A Case Report

Li Ji and Jiaojiao Bai\*

Outpatient of Multidisciplinary Diabetic Foot Clinic, Huadong Hospital, Shanghai, China

### Abstract

Abnormal toenails can seriously impede the healing of wound. Even under the condition of good blood perfusion, if the local pressure cannot be released, the ulcer will be difficult to heal and easy to relapse. So it is very significant to deal with abnormal growth of toenails timely and correctly to avoid the occurrence and development of diabetic foot ulcers. In October 2014, the outpatient of diabetic foot in our hospital successfully treated a huge stubborn abnormal toenail through relieving the oppression on adjacent tissue and maintaining the integrity of skin.

**Keywords:** Diabetic foot; Abnormal toenail; Nursing

### Introduction

It is reported that 46 percent of diabetic patients are along with abnormal toenails, 35% of which were with ingrown toenails [1,2]. As known, abnormal toenails can seriously impede the healing of wound. Even under the condition of good blood perfusion, if the local pressure cannot be released, the ulcer will be difficult to heal and the prevalence of relapsing is up to 40% [1,3]. It is very important to treat abnormal toenails timely and correctly to avoid the occurrence and development of diabetic foot ulcers. In October 2014, the outpatient of diabetic foot in our hospital successfully treated a huge stubborn abnormal toenail. The report is as following:

### Case Presentation

An 82-year-old man with type 2 diabetes for 32 years went to the outpatient of diabetic foot because of the irregular growth of his first left toenail. He had poor glycaemic control. The body mass index was 24.25 kg/m<sup>2</sup> and HbA1c was 7.5%. Toenail plate, the dirt embedded into, grew spirally, up to 0.7 cm. The connection between the nail plate and bed was loosening and the nail root was rugged and irregular. The skin around the abnormal toenail was dark red and slightly swollen. Even at rest, the patient felt painful and the pain score scale was 6 points, while the patient was more painful and the score was 8 points when walking. The transcutaneous oxygen saturation (%) was 95%. Due to the depression of abnormal toenails, the local depressed may be lack of oxygen and make the oxygen saturation decrease. The degree of Wagner diabetic foot classification was 0. Moreover, dorsalis pedis and posterior tibial artery could be touched and the 10g nylon test was positive with 5 points losing feeling, suggesting the existence of peripheral neuropathy.

### Nursing

At first, in order to soften the hard nail, we asked the patient to soak his foot in warm water, whose temperature was about 37°C. After 20 minutes, made the patient supine on the bed comfortably.

Then to trim the abnormal toenail (Figure 1). The treatment was operated by specialist nurses of diabetes with a senior title of professional post in broad and quiet environment where nobody moved. Before operating, sterilized the abnormal toenail and tissues around it and waited for drying. Due to the closely connection between the nail and its edge, it was hard for toenail pliers to enter into the gap. Therefore, in case of injuring the marginal organizations of the abnormal toenail, we firstly accepted the separation technology to make the gap slightly open with a tool named tongue exploration spoon. Then the head of the new nail plier probed into the gap slowly, bitted and cut the toenail carefully. We



**Figure 1:** The Steps of trimming the abnormal toenail (a) The abnormal toenail (b) Trimming technology with the new nail plier (c) Separation technology with tongue exploration spoon (d) Restoring the toenail as circular shape.

had better restore the toenail as circular shape to promote the abnormal toenail turning into regular growth. However, the abnormal toenail could not be trimmed too deeply. We had better divide the pruning process into several steps to avoid damaging the tissue beneath the nail plate. After trimming, we examined the skin and adjacent tissue around the toenail and did not find abnormal situation, such as damaging, bleeding and so on. At last, we sterilized the abnormal toenail and surrounding tissue again.

After finishing the operation, the transcutaneous oxygen saturation of the abnormal toenail examined again was 97%; the score of the pain

\*Corresponding author: Bai J, Department of Hua Dong Hospital Affiliated to Fu Dan University, China, Tel: 86 21 6564 2222; E-mail: [bjj163163@163.com](mailto:bjj163163@163.com)

Received: January 25, 2016; Accepted: February 15, 2016; Published: February 19, 2016

Citation: Ji L, Bai J (2016) Nursing Care on an Elderly Diabetic Foot Patient with an Abnormal Toenail: A Case Report. Diabetes Case Rep 1: 103. doi: [10.4172/2572-5629.1000103](https://doi.org/10.4172/2572-5629.1000103)

Copyright: © 2016 Ji L, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

was 2 points when walking, while 3 points at rest. The patient could not soak his feet at the night and should keep feet and the gap between the toes clean and dry.

Operators should pay attention and abide by separation technology to find the proper trimming site during trimming in case of harming normal tissue. Strictly follow the step-pruning techniques until finishing the pruning process gradually rather than hastily. As well as, notice complaints of patients. Once the patients feel uncomfortable, the operation should be suspended.

## Discussion

There are various methods to treat abnormal toenails. The selection of techniques mainly depends on the stage classified by the Mozena classification system [4]. Conventional treatments are divided into two categories, including conservative treatments and surgical therapy [5]. The former is more commonly used, such as gutter splint, dental floss technique, and angle correction technique and so on, mainly through separating the nail plate and bed of the ingrown toenails to make the plate grow on the surface of the bed. The latter is a method that directly or indirectly removing part or whole ingrown toenails and the surrounding tissue, like partial resection of the nail bed, wedge resection of the toenail and nail fold. Both of them are invasive and not suitable for elderly patients with diabetic foot who have the poorer capacity of trauma recovery due to the regression of body dysfunction, peripheral vascular neuropathy and reduced immunity [6,7], which is very feasible to result in diabetic foot ulcers, infection or amputation. Therefore, to find a suitable treatment to deal with ingrown toenails in the elderly with diabetic foot is extremely important.

What the most important in this case is that the technology is non-invasive. For the elderly with diabetic foot, it needs the help of special tools to trim the stubborn toenails to improve the effectiveness and safety. There are two new professional tools used in this case. One is the new nail plier (Patent Number: 2013203907914) with longer operating handle, shorter blade. The head of the plier is round and the blade can form a small "crotch" when closed which not only avoids destroying

the skin but also improves the safety. The other is the tongue-like probe spoon (Patent Number: 2014200160650). It is not easy to injure the soft tissue because that the tongue plate is round and shovel-shaped. In addition, the tail of the tongue plate and the operating handle are connected by a bridge bar ensuring better sight and more easily for operators to trim toenails. In a word, the treatment combining professional tools, separation technology and timely pruning technique can effectively reduce the injury causing by the stubborn toenail in diabetic foot.

## Acknowledgements

Research project sponsored by Key Geriatrics Clinical Trials Registry in Shanghai (Code: 13DZ2260700)

## Conflict of interest

We declare that we have no financial and personal relationships with other people and organizations that can inappropriately influence our work.

## References

1. Somroo JA, Hashmi A, Iqbal Z, Ghori A (2011) Diabetic Foot Care-A Public Health Problem. *Journal of Medicine* 12: 109-114.
2. Gupta A K, Konnikov N, Macdonald P, Rich P, Rodger NW, et al. (1998) Prevalence and epidemiology of toenail onychomycosis in diabetic subjects: a multicentre survey. *Br J Dermatol* 139: 665-671.
3. Pound N, Chipchase S, Treece K, Game F, Jeffcoate W (2005) Ulcer-free survival following management of foot ulcers in diabetes. *Diabet Med* 22: 1306-1309.
4. Khunger N, Kandhari R (2012) Ingrown toenails. *Indian Journal of Dermatology, Venereology, and Leprology* 78: 279-289.
5. Martinez-Nova A, Sanchez-Rodriguez R, Alonso-Pena D (2007) A new onychocryptosis classification and treatment plan. *J Am Podiatr Med Assoc* 97: 389-393.
6. Hong-Ying C, Na H (2011) Etiological agents and pathogenesis of several kinds of delayed wound healing. *Journal of Traumatic Surgery* 13: 368-370.
7. Frykberg RG (2004) The pathogenesis of diabetic foot ulcers: the factors hindering the wound healing. *Foreign Medical Sciences (Section of Endocrinology)* 24: 296-298.