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CASE REPORT
Reconstructive

A Novel Nonsurgical Treatment for Pincer Nail That Involves Mechanical Force Control

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Summary: We hypothesize that nails have an automatic curvature feature and that their flat shape is maintained by the daily upward mechanical forces from the finger/toe pad. Thus, nail deformities, such as pincer nail, spoon nail, and koilonychias, may be caused by an imbalance between these forces and can be treated by controlling these forces. Here, we report the case of a 55-year-old man whose severe pincer nail was effectively treated by thinning the nail, which reduced the automatic curvature force. This is the first report to show that pincer nail can be treated by a nonsurgical method that reduces the automatic curvature force, thus obviating the need for surgery. This supports the notion that mechanical stimulus–based treatments have high therapeutic potential for nail deformities. *(Plast Reconstr Surg Glob Open 2015;3:e311; doi: 10.1097/GOX.0000000000000220; Published online 19 February 2015.)*

Our previous studies suggested that mechanical forces may influence nail configuration and could be involved in the development of nail deformities.[1–4] This led to the hypothesis that nails have an automatic curvature feature and that their normal flat shape is maintained by the daily upward mechanical forces from the finger/toe pad. In other words, under normal conditions, the upward daily mechanical force and the automatic curvature force are well balanced. However, an imbalance between these 2 forces may cause nail deformation. For example, pincer nails may be caused by the absence of the upward mechanical forces and/or by a genetically driven overstrong automatic curvature force. By contrast, koilonychias may occur when the upward mechanical force exceeds the automatic curvature force, thereby causing the nail to curve outward. This hypothesis then led us to propose that nail deformities can be treated by improving the balance between automatic nail curvature force and the upward mechanical forces from the finger/toe pad. The present case report showed for the first time that indeed, pincer nail can be treated by reducing the automatic curvature force, namely, by thinning the nails. This nonsurgical approach obviated the need for surgery.

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Received for publication September 9, 2014; accepted September 16, 2014.

DOI: 10.1097/GOX.0000000000000220

CASE REPORT

For more than 10 years, a 55-year-old man was occasionally bothered by pain arising from the pincer nail of his left great toe. We proposed to thin the nail of his left great toe and provided him with a thorough explanation regarding the purpose and method of this treatment. He consented to participate. His nail configuration was measured by calculating the curve index, which is defined as (nail height/nail width) × 100 (%).[1–3] Before treatment, the left curve index of his great toe nail was 85.7% (Fig. 1), and his left great toe nail thickness was 1.4 mm. This thickness was thinned to 0.90 mm by using a nail grinder. Ten days later, the nail showed signs of improvement (Fig. 2). The patient was followed up once in the following 2 weeks, and the new nail

Disclosure: *The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by Nippon Medical School.*

Fig. 1. Appearance before treatment.

Fig. 2. Ten days after nail thinning, the nail showed signs of improvement.

arising from growth was also thinned. Eight weeks after thinning commenced, the nail configuration had improved dramatically: the curve index was now 54.2% (Fig. 3). The patient no longer had any pain, and he was satisfied with the result of the treatment.

DISCUSSION

To treat pincer nail, various surgical[5–8] and conservative measures[9,10] have been classically used. The surgical procedures aim to remove the nail matrix cells but have several disadvantages, namely, the surgery can be complex, the patient may feel

Fig. 3. Appearance 2 months after nail thinning commenced.

pain after surgery, the surgical procedure can be time consuming, local anesthesia is needed during the operation, and cosmetic deformity can ensue. The conservative treatments involve the use of an elastic wire[11] or a plastic device[12,13] and aim to reinforce the upward daily mechanical force. Although the latter treatments are relatively noninvasive, they demand frequent care, and the recurrence rate is high.

We propose the following treatment principle for pincer nail. It is less invasive than surgery and is based on the hypothesis that is detailed in the introductory paragraph. Thus, pincer nail could be treated (or prevented) either by reinforcing the upward daily mechanical force or by reducing the automatic curvature force of the nail or both. To reinforce the upward daily mechanical force, the classic conservative measures described above can be used. In addition, massage, a stimulatory machine, or changing the walking style so that more pressure is placed on the toe pad may be useful. To reduce the automatic curvature force of the nail, the nail could be softened or thinned by applying an external preparation. This would serve to reduce both the hardness and thickness of the nail.

In the present case, nail thinning was used because our cumulative experience suggests that thick nails tend to show strong nail curvature, and the toe nails of our patient were quite thick compared to what is normally seen in the toe nails of healthy ambulatory adults (approximately 0.8 mm).[1] The thinning of the patient's pincer nail dramatically improved its excessive curvature after 2 months. Complications were not observed. This

result reinforced the validity of our hypothesis. It also suggested that mechanical stimulus-control treatments may have high therapeutic potential for nail deformities. Further studies are needed to determine the long-term outcomes of this approach and to establish an optimal and effective thinning method.

CONCLUSION

This case report showed that pincer nail can be treated by thinning the nail. This result suggested that nail deformities may be treated by improving the balance between automatic nail curvature force and the upward mechanical forces from the finger/toe pad.

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