



# Experience of Painless Treatment of Ingrown Toenail by the 3D Application Using an SH Wire

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## Abstract

Although many ingrown toenail orthosis therapies have been attempted in the past, it is difficult to treat ingrown toenails when the nail is short, and granulation is present. Using the SH (Spring Hook) wire, efficient and painless correction of such toenails is possible. 3D application using SH wire enables remote correction and facilitates painless treatment. I would like to show the cases and introduce the actual situation.

**Keywords:** Ingrown toenail; Orthosis therapy; 3D application; SH wire; Remote Correction

## Introduction

The SH wire is a nail correction wire originally devised by the author in 2011 [1,2,3,4]. It is a nail correction device that uses it to correct the curvature of the nail. The principle diagram is shown in

Figure 1a. The actual adhesions are observed in Figure 1b, Figures 2a & 2b, and Figure 3a. The points of effort, fulcrum, and points of action when actually mounted are shown in Figure 1b.

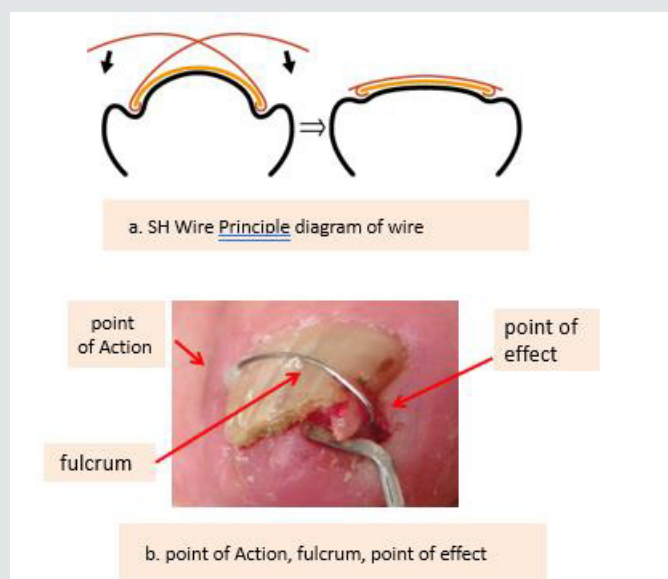


Figure 1: SH (Spring Hook) wire principle and practice.



Figure 2: Parallel mounting and Diagonally mounting.

**What is 3D wiring in ingrown toenail?**

Figure 2a is a horizontal hook and Figure 2b is a diagonal hook. In the case of diagonal hook, if the nail is curved in the cross section, 3D mounting must be used (Figure 3a).

**Why use 3D mounting instead of diagonal hanging?**

This is because in the case of a curved nail like this Figure 3a, if you simply hang it diagonally, it will slide in the direction of the white arrow in Figure 3b. It is the ice pick phenomenon that blocks

the slip. Before explaining the ice pick phenomenon, each part of the SH wire is shown in Figure 3c. It will be described in Figure 3d below. Bend the wire about 30 degrees at the fulcrum. By doing so, when a force is applied to the force point, the wire causes axial rotation. The tip of the wire hook sticks into the nail, which is called the ice pick phenomenon. The wire and nail are firmly fixed by the ice pick phenomenon. This is the difference between 2D mounting and 3D mounting.

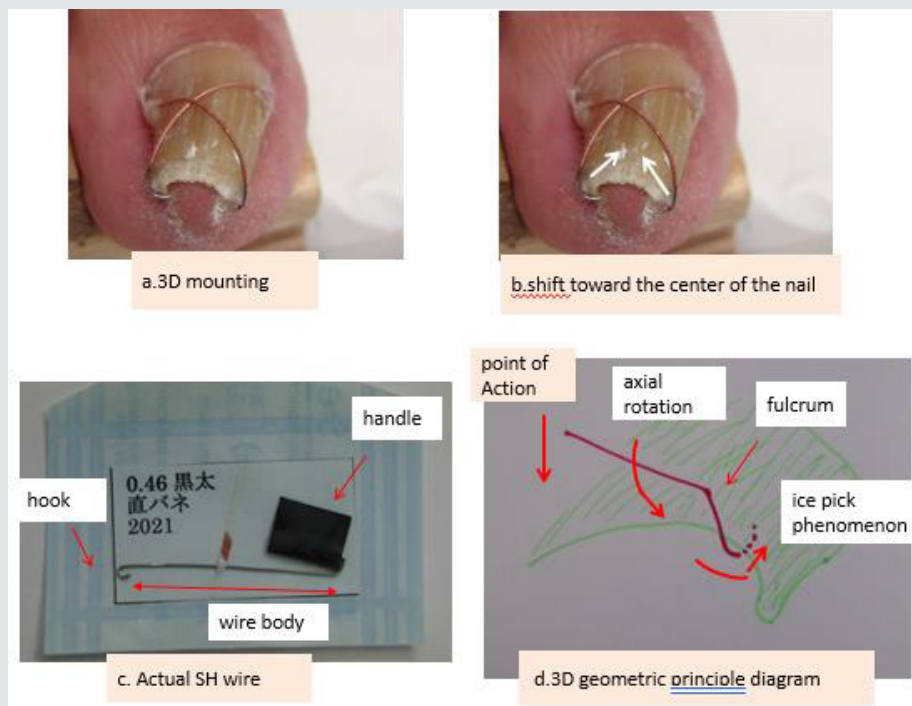


Figure 3: The practice and principle of 3D mounting.

## Remote Correction

In ingrown toenail treatment, touching the ingrown part often hurts. In such a case, remote treatment is a method of lifting the nail by operating a place (several mm) away from the painful place without touching it.

## Case Presentation

Case 2: A case of 3D application of the SH wire.

50-year-old man, first visit June 29, 2012

a) Medical history: Nothing to note.

b) Chief complaint: Strongly rolled ingrown toenail on the left hallux, with strong swelling and pain.

c) Progress: Half a year ago, he underwent partial nail surgery at another doctor. After that, the nails were extremely rolled up (Figure 4a).

d) Treatment: At the first visit, use the 3D application technique as shown in Figure 4b, and hang a wire on the front of the tip of the nail plate (Figure 4c). 4 months after the first visit, the SH wire was applied to the side edge of the nail (Figure 4d). It is completely flat after 6 months of the first visit (Figure 4e).



Figure 4: A case of 3D mounting of SH wire.

## Cases of the author's clinic

At our clinic, we treated 8100 ingrown toenails during the 11 years from April 2011 to March 2022 using the Sogawa nail correction method. There were 36 cases that did not heal. For those who did not heal, the phenol method was performed and the course was good. After all, the cure rate in this method was 99.5% (8064/8100). Anesthesia is not required when performing the Sogawa nail correction method, but in one case, the skin covered the nail thorns so finger block anesthesia was performed. This was the only case that required anesthesia with the Sogawa nail correction method.

## Discussion

VHO hooks the nail edge [5], and MACHI wire passes the wire through the hole made in the nail to fix the nail and the wire [6].

To the best of my knowledge, there is no other method of ingrown toenail treatment by adhering a wire to the nail surface (PubMed 2000-2021). The author initially used Aron Alpha for adhesion, but peeling occurred frequently, and two years later I applied dental technology and adopted the photopolymerization method. The SH wire uses a stainless wire for springs instead of a super elastic wire. The reason is that the hook can be adjusted according to the shape of the nail and the price is low. The price of SH wire is less than 1/7 of the above two types of wire. The repulsive force of stainless steel for springs is strong, and I have never felt any difficulty due to insufficient straightening force. In addition, 7 types of wire thickness are prepared, and it is a feature of this method that even small and thin nails such as the little finger of the hand can be attached easily and in a short time, just like the hallux. There are various ingenuity for bonding, such as preparation of the nail

surface, wire work at the time of adhering, wire gripping device, nail lever that facilitates wire attachment, and RP wire to prevent recurrence. In order to disseminate these technologies, we are holding remote seminars using the WEB. The seminar takes about 3 hours, but you can master everything. It also supports foreign languages, and anyone in the world can participate.

## Summary

In the Sogawa method, the SH wire can be hung diagonally. In the case of curved nails, 3D mounting is performed. Remote treatment and stepwise treatment are possible, and as a result, painless ingrown toenail treatment has been realized.

## Thanks

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