

# Dupuytren's Fasciectomy: Surgical Pearls in Planning and Dissection

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**Summary:** Fasciectomy remains the mainstay of surgical treatment for Dupuytren's disease at many units worldwide, particularly in cases of recurrence after aponeurotomy or enzymatic fasciotomy. In some series, this has been reported as high as 48% in 3 years. The lead author has since abandoned the use of collagenase altogether. In this innovation article, we describe simple maneuvers to aid the planning and dissection of a Dupuytren's fasciectomy. We describe techniques to enable efficient dissection of the cord and minimize problems when designing skin flaps. We also highlight technical points in revision cases. (*Plast Reconstr Surg Glob Open* 2020;8:e2832; doi: [10.1097/GOX.0000000000002832](https://doi.org/10.1097/GOX.0000000000002832); Published online 21 July 2020.)

## INTRODUCTION

Dupuytren's fasciectomy remains the mainstay of surgical treatment for Dupuytren's disease at many units worldwide, particularly in cases of recurrence after aponeurotomy or enzymatic fasciotomy.<sup>1</sup> In some series, this has been reported as high as 48% in 3 years.<sup>2</sup> The lead author has since abandoned the use of collagenase altogether.

In this short communication, we describe simple maneuvers to aid the planning and dissection of a Dupuytren's fasciectomy. We describe techniques to enable efficient dissection of the cord and minimize problems when designing skin flaps. We also highlight technical points in revision cases.

## SKIN FLAPS

If there is no shortage of skin and the contracture is mild (<30 degrees), the lead author uses a Bruner-type skin pattern for the initial incision. If there is a moderate skin shortage, one can convert this into Y to V plasties (Fig. 1). If there is a severe skin shortage, the author tends to design a Skoog-type pattern and then perform Z plasties at the end of the procedure (See figure, Supplemental Digital Content 1, which displays planning of the Skoog incision on 2 digits, <http://links.lww.com/PRSGO/B419>). The Skoog pattern gives room to adjust the skin flaps, particularly if there is accidental button-holing of

the skin during the dissection. In cases where there is a skin shortage in the palm, a McCash open palm technique can be performed where the wound is left to heal by secondary intention. Splinting postoperatively is extremely important with this technique to prevent contracture.

Many surgeons believe that it is best to place Z plasties over the creases (Fig. 2). This, however, results in increased tension and a higher risk of tip necrosis. It is better to place the Z plasty between the creases, where there is much more skin laxity.

If the patient has a high risk of recurrence with a strong Dupuytren's diathesis, dermofasciectomy should be considered. Here it is important that the graft be placed from mid-lateral line to mid-lateral line—if it is not, there is a risk of contracture. If there is postoperative skin flap loss, the senior author recommends conservative management with dressings as most wounds will re-epithelialize within 4 weeks.<sup>1</sup>

## DISSECTION USING “TUNNELS” AND “WINDOWS”

Dupuytren's remains a dissection of disease from the digital nerves, as coined by Hueston.<sup>3</sup> The lead author's preference is regional anesthesia for Dupuytren's fasciectomy. Rarely, the Wide Awake Local Anesthesia No Tourniquet technique is used where regional anesthesia is contraindicated or the contracture is mild. Although other authors have suggested its safety, this author believes that the bloody field can distort planes and—particularly for the less experienced hand surgeon—poses risk of iatrogenic injury to the neurovascular (NV) bundles.<sup>4</sup>

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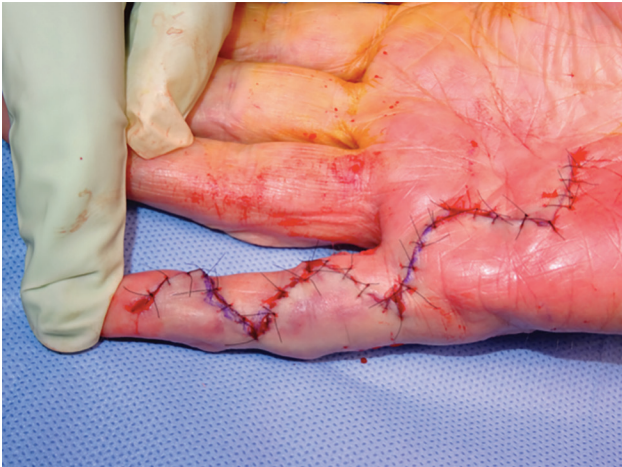
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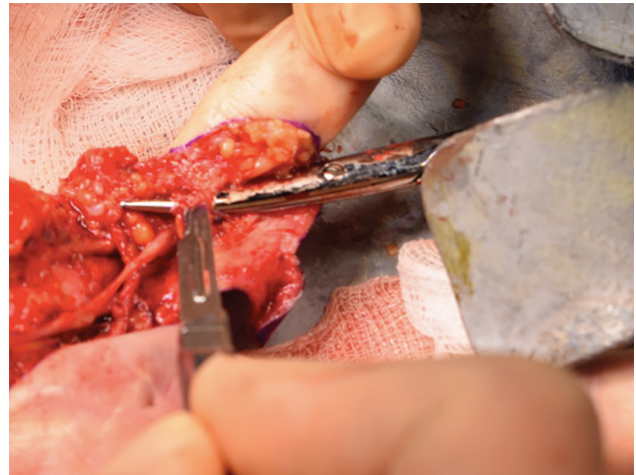
**Fig. 1.** Completed Y to V incision.



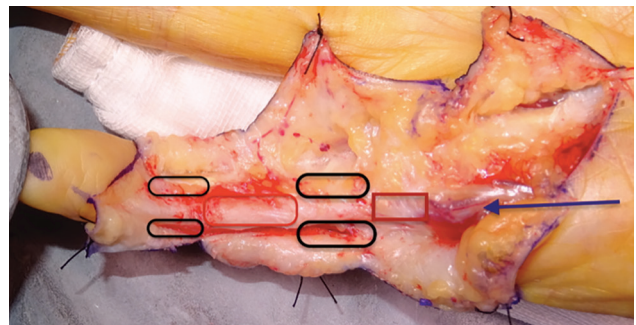
**Fig. 2.** Here the Z plasties have been incorrectly placed over the creases. Note that one of the flaps is white on final inset (see arrow); this subsequently underwent marginal necrosis. The use of skin creases is not advised.

The lead author quotes a <1% risk of nerve injury.<sup>5</sup> Dissection is started proximally, and as in the standard fashion, the NV bundles are identified first. Tenotomy scissors are passed over the nerve, making small tunnels above both NV bundles. (See **Video 1 [online]**, which demonstrates a tunnel being made with tenotomies over the NV bundle adjacent to the cord. The transverse fascia is divided here, to help release the cord.) Instead of blindly cutting the diseased tissue, the NV bundle is protected by the overlying tenotomy scissors and the knife is pushed over to release the cord (**Fig. 3**). This maneuver is repeated until as much space is created as possible on either side of the pretendinous cord that overlies the flexor tendon.

Because these tunnels are made on either side of the cord, if there is uncertainty where the nerve is passing or if it is being pushed centrally by a spiral cord, the lead author makes windows distally trying to visualize the nerve and to determine its position relative to the fascia and cord. (See **Video 2 [online]**, which demonstrates a window being



**Fig. 3.** The tenotomy scissors making a tunnel over the NV bundle is demonstrated. The tenotomy scissors protect the underlying NV bundle and allow for safe division of fascia/cord with the blade.



**Fig. 4.** The cord is dissected free very rapidly, making tunnels and windows distally (See **Videos 1 and 2**). The tunnels are made across the areas highlighted in red, and the tenotomy scissors are slid under plane over the NV bundle. The windows are made distal to the areas marked in black on either side of the cord to identify the NV bundles.

made to identify the NV bundle.) Making these windows and tunnels simplifies the dissection of the cord away from the NV bundle and minimizes the risk of NV injury. The technique can be repeated on both sides of the digit in a stepwise manner until the cord is completely freed (**Fig. 4**). Cutting with the blade over the top of tenotomy scissors is a safe method to protect the NV bundle, as is pushing fascia and cord away from the NV bundles under direct vision with the belly of a 15-blade. The pushing motion using the blade is far less likely to injure NV structures when compared with the cutting motion with tenotomies.

### RELEASING THE PIPJ

Often in long-standing cases of Dupuytren's, residual contracture of the proximal interphalangeal joint (PIPJ) remains following cord release. To get full correction, the author first performs passive stretching of the PIPJ in a method described by Breed and Smith.<sup>6</sup> However, this often fails to provide full correction, and care must be taken to not excessively force the PIPJ or one can fracture the finger.

The PIPJ is best identified by using the articular branch that originates from the digital artery (See figure, Supplemental Digital Content 2, which displays the author finds that identifying the articular branch of the digital artery helps identify the PIPJ, and here if necessary, sequential steps for joint release can be performed, <http://links.lww.com/PRSGO/B420>). Once it has been identified, the author performs a stepwise release of the joint as described by Belusa et al,<sup>7</sup> first releasing the A3 pulley. A window is then made in the sheath, and the flexor tendons mobilized and checkrein ligaments identified. These are divided either with a beaver blade or a 15-blade. If this fails to fully correct the joint, the lead author proceeds with accessory collateral ligament release, and as a last resort, volar plate release.

### THE “REVISION” CASE

If a patient has recurrence after needle aponeurotomy, the author offers a Dupuytren's fasciectomy. In cases after fasciectomy with recurrence, a dermofasciectomy is the next option. For revision cases, the risk of NV injury is higher; therefore, we recommend preoperatively testing sensation using sensory 2-point discrimination and performing a digital Allen's test.

Often the dissection can be challenging in repeat cases, and it is hard to follow the windows and tunnels technique described earlier. The lead author has previously reported the use of the microscope when the surgeon reaches a point where the scar tissue is difficult to dissect free from the NV bundles.<sup>5</sup> This facilitates an easier dissection, and in a series of 17 revision cases, we did not experience any NV injury.<sup>5</sup>

### THE COMPROMISED DIGIT

We have all been in the scenario when the digit is pale after full correction of the metacarpophalangeal joint and PIPJ. This often does resolve and is secondary to vasospasm in the digital arteries. If there is a delay, treating the

digit with warm saline and using verapamil or lidocaine are beneficial.

If there is suggestion that both digital arteries have been divided, the lead author recommends microsurgical repair. In the little finger, the digit may be perfused by a dorsal circulation; however, this is unreliable. In the event of iatrogenic injury to both vessels, we suggest dissecting the dominant digital artery out as far proximally as possible. Mobilization of the vessel will allow a tensionless anastomosis without a vein graft. Before anastomosis vessel ends are prepared, lidocaine or verapamil is used to confirm a good proximal flow. If feasible, it is ideal to repair both digital arteries. The digit is then managed like any other revascularization case.

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