

# The Dermatraction Technique For Closure Of Fasciotomy Wounds

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## Abstract

## INTRODUCTION

The technique of dermatraction for closure of fasciotomy wounds was first described by Cohn in 1986 (1). The initial procedure was performed using vessel loops arranged in a shoelace pattern but since then several variations have been described including the use of steri strips(2). We describe a case in which we used this technique with success, review its use in the current literature and highlight its potential benefits, both surgical and economic.

## CASE REPORT

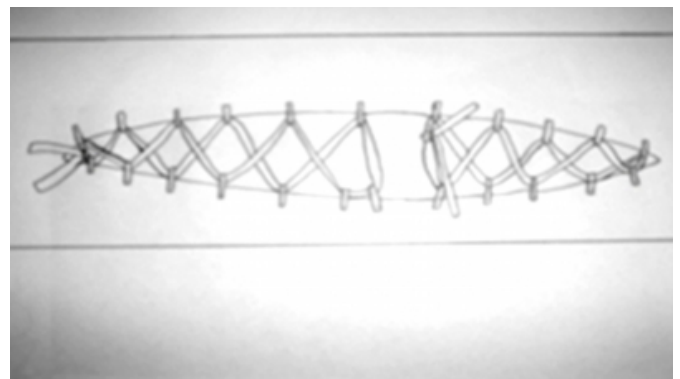
A 16yr old male was struck by a car and suffered closed transverse fractures of the distal 1/3 of his right tibia/fibula. The fracture was 100% displaced and complicated by marked swelling. There was no initial neurovascular deficit.

Intramedullary nailing of the tibia was performed within 12 hours and at this time the patient was complaining of paraesthesiae in his foot along with progressive pain on movement of the toes. The compartments of his leg felt very tight at surgery.

A fasciotomy was thus performed and the muscles were bulging through the fascia. Delayed primary closure was attempted at 72 hrs later but it was impossible to close the skin.

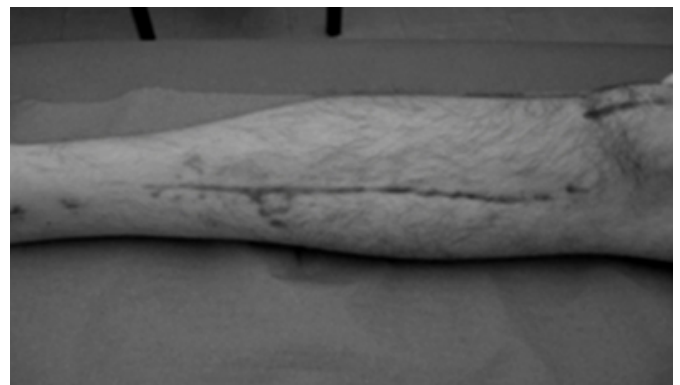
We applied the dermatraction technique using a size 12F Foley's catheter. The technique was simple and involved anchoring the catheter to alternate edges of the wound using skin staples placed 1cm from the skin edge (Fig. 1).

Figure 1



The traction effect on the skin edges was clear. It caused the patient no discomfort and there were no pressure effects or inflammation in the skin edges. The proximal 2/3 his wound closed fully but the distal 1/3 was reduced to approximately 25% of its original size and was covered using a split skin graft on day 11 post op (day 12 post injury) and was discharged without any complications (Fig. 2, Fig 3). His fracture has been healing quite well with abundant callus and without any infective complications and he is currently back to full weight bearing

Figure 2



**Figure 3**



### DISCUSSION

In his initial description of the technique Cohn used vessel loops and advocated daily tightening. Since then numerous variations have evolved including applications of the vessel loops 48 hrs post op (Harris)<sup>(2)</sup>, use of a large nylon suture<sup>(3)</sup> and various regimes for tightening these.

The technique is very simple, easy to learn and does not require sophisticated equipment and involves anchoring the tensioning material (vascular loops or, in this case, a Foley's catheter) to alternate sides of the wound (approximately 2-3 cm apart) keeping about 1cm from the edges (Fig. 1). The tension is then adjusted manually before the last anchoring staples are inserted.

Studies have shown this technique to be cost effective, decreases the need for skin grafts (and its associated morbidity and mortality) and achieves skin closure with acceptable aesthetic results<sup>(4)</sup>

This technique allows easy access to the wound for inspection and toilet with maximal patient comfort and tolerance. It has to be planned carefully however, as there are potential complications. We faced one such problem in that the areas of skin which the catheter was in contact with appeared blanched, showing early signs of pressure effects. This could possibly be negated by placing a sterile swab

along the wound edge under the rubber band as tension is increased. This acts as a protective cushion for the skin and could be a useful alteration to the technique for tight wounds.

Zorilla et al used this technique in 20 patients for primary wound closure on all limbs in patients ranging from 2-88 yrs. The wounds were cleaned daily and the vessel loops tightened at 48 hour intervals. He found that the average number of tightenings to closure was 4.5 and wounds were closed on average 8.8 days post operatively. All wounds were closed with sutures under local anaesthesia without need for skin grafting and complications were minimal.

Compared to other dermatraction systems such as prepositioned intracutaneous sutures and the Marberger skin approximation system, the shoelace technique has been found to have superior results, fewer complications and was the superior method in terms of technical difficulty readily available materials.

In our patient a 12 Fr Foley's catheter was used instead of vessel loops. It was inserted 48 hrs post fasciotomy using a technique described by Brennan et al. and was tensioned at 48hrs. His wound closed 11 days post op with the help of a split skin graft. He suffered no complications.

### References

1. Injury. 1993 Sep;24(8):565-6. Gradual closure of fasciotomy wounds using a vessel loop shoelace. Harris I.
2. Am J Surg. 2001 Oct;182(4):434. A simpler, less expensive technique for delayed primary closure of fasciotomies. Harrah J, Gates R, Carl J, Harrah JD.
3. Scand J Plast Reconstr Surg Hand Surg. 2000 Dec;34(4):315-20. Wound closure by dermatraction after fasciotomy for acute compartment syndrome. Wiger P, Blomqvist G, Styf J.
4. Ann Plast Surg. 2000 Feb;44(2):225-9. The vessel loop shoelace technique for closure of fasciotomy wounds. Asgari MM, Spinelli HM.

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