

## The Use of Fibrin Sealant for Skin Grafting a Therapeutically Anticoagulated Patient

Jie Zhao MD MSc\*, Samwel Makanyengo MBchB, MCS (ECSA) and Andrew Martin BHB MBchB

General surgery, The Maitland Hospital, Maitland, 2305, Australia.

### \*Correspondence:

Jie Zhao, General surgery, The Maitland Hospital, Maitland, 2305, Australia.

Received: 13 October 2019; Accepted: 07 November 2019

**Citation:** Jie Zhao, Samwel Makanyengo, Andrew Martin. The Use of Fibrin Sealant for Skin Grafting a Therapeutically Anticoagulated Patient. J Med - Clin Res & Rev. 2019; 3(6): 1-3.

### Keywords

Skin graft, Infection, Haematomas, Healing process.

### Introduction

Skin graft take may be compromised by infections and haematomas [1]. Studies demonstrate better graft take with the use of fibrin sealants for fixation. [2-7]. They have a haemostatic effect and reduce the incidence of infection [5,6]. No guidelines currently exist in Australia that take into consideration the cost-effective and safety aspects when managing patients on therapeutic anticoagulation considered high risk for cessation who need skin grafts especially in view of the availability of fibrin sealants.

We report the case of an 82-year-old male therapeutically anticoagulated with Clexane™ for a pulmonary embolus who sustained four large haematomas on both his lower limbs following a fall. Evacuation of the haematomas necessitated skin grafting. Fibrin sealant (Tisseal™) was used with good effect without having to stop the anticoagulant.

### Case Report

We present the case of an 82-year-old gentleman who sustained four large haematomas on his lower limbs after a mechanical fall. He was therapeutically anticoagulated with Clexane™ due to being diagnosed with a pulmonary embolism 3 months prior. This was in the setting of squamous cell carcinoma of the lung and longstanding congestive cardiac failure. He was deemed too high risk to stop the anticoagulation. The haematomas were located on both dorsa of his feet, the lateral aspect of his right leg and the posterior aspect of his right leg (Figures 1 & 2).

The haematomas were too large to be managed conservatively and posed a risk for infection and further bleeding.



Figure 1: Right dorsal foot haematoma.



Figure 2: Left dorsal foot haematoma.

The decision was made to evacuate the haematomas while keeping the patient anticoagulated. Fibrin sealant would be used for haemostasis and graft fixation. The patient underwent grafting in two sessions. The two large haematomas on the dorsum of both feet were dealt with first. Skin was harvested from the back and thigh, meshed and fixed with Tisseal™ spray (Figures 3 & 4). 4 mls of the spray was used. He was taken back to theatre 4 days later and the same was done for the rest haematomas. Another 4mls of Tisseal™ was used. Photographs were taken to document the healing process.



**Figure 3:** Right foot after evacuation and grafting and Tisseal™.



**Figure 4:** Left foot after evacuation and grafting and Tisseal™.

All four grafts took well as documented by photographs (Figures 5 & 6). This was despite a rocky post-operative recovery which included an exacerbation of his congestive cardiac failure. He was discharged to a rehabilitation ward then home after.



**Figure 5:** Right foot post op day 14.



**Figure 6:** Left foot post op day 14.

### Discussion

Skin grafts are a simple way to cover skin loss [1]. Grafting entails the transfer of a skin segment, which may vary in thickness, from a donor site to a recipient site [1]. Split thickness skin grafts include the epidermis and part of the dermis [1].

The haemostatic effect of fibrin was documented in the early 1900's [3,4]. It is currently used in neurosurgical, plastic and reconstructive procedures [3,4]. In normal physiology, fibrin is deposited in a wound shortly after injury. This functions as a matrix through which fibroblasts can migrate [3,4]. Fibrin glue applied to a wound mimic the proliferative phase of wound healing albeit faster [3,4].

There are different types of fibrin sealant and Tisseal™ is one of them. They contain concentrated fibrinogen, fibronectin, factor XIII and aprotinin which is added to thrombin and calcium [2-4]. Advantages of Fibrin sealants in skin grafting include haemostasis, improved graft attachment and antibacterial action [2-7].

One of the disadvantages of Fibrin sealants is the financial outlay.

The authors asked for quotations from local suppliers. According to one supplier., the cost ranges from approximately 130-190 Australian Dollars per ml. It gets cheaper with bulk buying. The tubing costs around 30 Australian Dollars and the regulators tend to be provided by the company. Allergy to aprotinin is a contraindication for using fibrin sealants [8]. Fibrin sealants cannot stop brisk bleeding and should never be directly injected into the circulatory system as that could lead to life threatening thrombosis [7,8].

Surgeons are increasingly faced with patients who need to undergo minor procedures and are on anticoagulants [9]. Novel oral anticoagulant are increasingly common [9]. The decision to reverse or withhold the anticoagulants is often fraught with its own risks especially and is sometimes not an option [9]. Bridging anticoagulation with heparin has its disadvantages and current guidelines and recommendations are based on weak evidence [9,10].

In this case study we have described a less explored option – using fibrin sealants. Notwithstanding the cost, the use of fibrin sealants for procedures such as skin grafts, minor skin excisions and temporal artery biopsies in the long run may prove to be cost effective and safer. Clinical controlled trials will need to be done to definitively prove this.

### Acknowledgment

Carolyn Ashley, Product Specialist, Advanced Surgery, Newcastle and Central Coast.

### References

1. Andreassi ABR, Biagioli M, D’Aniello C. Classification and Pathophysiology of Skin Grafts. *Clinics in Dermatology*. 2005; 23: 332-337.
2. Branski LK, Herndon DN, Jeschke MG, et al. Fibrin sealant improves graft adherence in a porcine full-thickness burn wound model. *Burns*. 2011; 37: 1360-1366.
3. Currie LJ, Sharpe JR, Martin R. The use of fibrin glue in skin grafts and tissue-engineered skin replacements A review. *Plast Reconstr Surg*. 2001; 108: 1713-1726.
4. Amrani DL, Diorio JP, Delmotte Y. Wound healing. Role of commercial fibrin sealants. *Ann N Y Acad Sci*. 2001; 2001: 566-579.
5. Mittermayr R, Thurnher M, Simunek M, et al. Skin graft fixation by slow clotting fibrin sealant applied as a thin layer. *Burns*. 2006; 32: 305-311.
6. Vedung S, Hedlung A. Fibrin glue Its use for skin grafting of contaminated burn wounds in areas difficult to immobilise. *J Burn Care Rehabil*. 1993; 14: 356-358.
7. Vibe P, Pless J. A new method of skin graft adhesion. *Scand J Plast Reconstr Surg*. 1983; 17: 263-264.
8. Baxter. Tisseal Fibrin Sealant. Baxter Healthcare Cooperation. 2019.
9. Patel JP, Arya R. The current status of bridging anticoagulation. *bjh*. 2014; 164: 619-629.
10. Douketis JD, Kaatz S, Becker RC, et al. Perioperative Bridging Anticoagulation in Patients with Atrial Fibrillation. *N Engl J Med*. 2015; 373: 823-833.