

# USE OF ULTRATHIN SPLIT THICKNESS SKIN GRAFT IN SECOND DEGREE DORSAL HAND BURN

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## Introduction :

The hand is a primary means of **communication, aesthetics, emotion, and sexuality**. Hands are injured in **80%** of severe burns and are a primary American Burn Association referral criterion. Loss of hand function from burn injury frequently limits the patient's ability **to work** and requires evaluation for **long-term disability**.

Functional recovery of the burned hand relies on quick and effective intervention by an experienced burn center. Generally held beliefs regarding skin grafts include the notion that thicker split-thickness skin graft (**STSG**) and full thickness skin graft (**FTSG**) have better functional results and cosmetic outcomes and decreases the need of secondary reconstructive procedure. Some support the use of ultrathin split thickness skin graft (**u-STSG**) for its superior graft take and donor site quick re-epithelialization, which may be important in large burns and limited donor sites.

We share our experience with a case of u-STSG in deep second-degree dorsal hand burn.

D + 10 post burn



Month + 3



D0 : burn



FLAMMAZINE

D+12 Surgery

SPLINT

COMPRESSIVE GARNEMENT + NIGHT ORTHESIS

D + 5 post graft

- Removal of the stiches
- Compressive Garments
- Automobilization
- Physiotherapy
- Night orthesis



Month + 6

- Full and painless range of motion
- Back to work



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## Case Report :

- A 37-year-old patient burned himself on the **back of his left hand** with hot oil splashes. The patient received a Flammazine® dressing once per 2 days until his intervention at D+15 post burn.
- We used an **u-STSG** (0.008 inches, non-meshed) to cover the dorsal aspect of the hand. The skin was harvested on the inside of the left thigh with a Zimmer dermatome. The graft was secured with **non absorbable sutures**. The postoperative period was simple and the pain was well controlled with classical analgesics.
- **The plaster splint and stitches were removed at day 5.** We started **early rehabilitative treatment** with a physiotherapist and the patient performed daily mobilization exercises at home. The patient wore a **compression garment for 23/24hour** and slept in a **custom-made night orthosis**. The donor area received an **Aquacel®** dressing until complete healing which was achieved on the **12th postoperative day**. **Hydration and sun protection** instructions were given to the patient as soon as healing was achieved.
- At the third postoperative month, the patient already had **complete functional mobilization of his hand** without development of hypertrophic scarring. Nevertheless, his hand remained inflamed with erythematous skin and a rapid recoloring time. We pursued the treatment with a compression garment until the **6th month**. The patient returned **to work**, with a **functional** hand but also with a successful **aesthetic** result.

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## Discussion:

Because the skin on the hand's dorsum is **thin** and used to **protect oneself** from injury during the **defensive reaction**, deep burns to the dorsum are **frequently** encountered. The **extensor** mechanism is also vulnerable to injury since there is little subcutaneous tissue, especially around the proximal interphalangeal joint. For decades, the consensus of the burn treatment consisted of **early excision associated with grafting**. However **the thickness** of the graft remains a source of **debate** among the surgeon population.

There is also ongoing debate over how to secure the graft, how to use splints, and when to start rehabilitation. In several groups, grafts are now stitched or sealed with **fibrin sealant**, and gentle active range of motion (**ROM**) is started on the first postoperative day. Other studies have used **K-wires** to immobilize fingers in the intrinsic-plus position for up to 6 weeks without experiencing any long-term ROM loss or articular surface injury. Last but not least, some people are still in favor of grafting the dorsum in **the fist position** since it lengthens the skin by 20% overall and reduces the danger of extension contracture due to STSG.

Even though all of these grafting and splinting techniques are supported by data, the main objective is to **start hand therapy as soon as possible**

By now, held beliefs is that FTSG, despite its morbidity of the donor site, have better functional and cosmetic outcome, with **less risk of contraction** than the STSG. It justifies its application in **face and hand burn** mainly. Nevertheless, this point of view tends to change with studies and case report, like our, which tend to prove that **u-STSG** associated with a well-designed rehabilitation program will improve the mobilisation and give equal cosmetics.

Burned hands are more likely to develop **fibrosis** because skin grafts and scars force the hand to contract and change shape, and because pain, edema, bandages, and splints restrict hand movement.

Split Thickness Skin Graft (STSG)	Full Thickness Skin Graft (FTSG)
Part of the dermis and epidermis	Dermis and epidermis (with fat)
Less resistance	More resistance
Poor cosmetic result with higher rate of contraction, poor color match and pigmentary changes	Better cosmetic result
Less morbidity of the donor site	High morbidity of the donor site (hypertrophic scarring)
Use on large surface	Use on small defect in site with important aesthetic outcome
Superior graft take	Less chance of graft survival
Second harvest of the donor site is possible (<0,012i)	Second harvest of the donor site is impossible

## CONCLUSION :

The reported case adds to the literature on u-STSG. U-STSG is an alternative for early reconstruction in hand burn surgery. It can deliver good functional outcomes, with consideration of several influential factors especially splinting and early rehabilitation.



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