

# Suprathel Dressing at Split Thickness Skin Graft Donor Site for Pain Control and Wound Healing

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## ABSTRACT

**Back ground:** Split thickness grafting is a routinely done procedure in treatment of burn and coverage of other wounds. These patients require management of both donor site and grafted area. Donor site wound may be more painful and distressing as compared to the patient's skin grafted area and there may be additional scarring. Different types of dressing are used for healing of SSG donor area.

**Aim:** To compare conventional dressing and Suprathel dressing at SSG donor site in terms of total consumption of analgesic medication and duration of wound healing.

**Methods:** Randomized control trial was conducted in the Department of Plastic and Reconstructive Surgery/ Burn unit of Mayo Hospital over a period of 1 year (Dec 20 – Dec 21). A total of 64 patients of skin grafting were included. They were divided into 2 groups, Group A (32) treated with conventional paraffin medicated gauze and in Group B (32) Suprathel dressing was used on graft donor site. Patients pain score was calculated using NVAS (Numeric visual analogue score) and healing time was recorded in both groups.

**Results:** Total of 64 patients were included in study with 32 in each group. There were 35(54.7%) males and 29(45.3%) females. Pain score in Group A was:  $\leq 5$  in 11 patients (34.4%) and  $\geq 5$  in 21(65.5%). In Group B  $\leq 5$  in 22 patients (68.85%) and  $\geq 5$  in 10(31.2%). Healing time in Group A was:  $\leq 14$  days in 17 patients (53.15%) and  $\geq 14$  days in 15(46.8%). In Group B  $\leq 14$ days in 25(78.1%) and  $\geq 14$  in 7( 21.9%). There was significant difference between patient pain score (.005) and healing time (p.0.03) in comparison of suprathel dressing and paraffin medicated treated donor site

**Conclusion:** Suprathel represents a reliable epidermal skin substitute having an impact on wound healing and wound pain on donor site for graft. It enhances wound healing and decreases dose of analgesia.

**Keywords:** Graft Donor site, Suprathel, Pain score, wound healing.

## INTRODUCTION

Skin grafting is most common procedure done in patients requiring wound coverage. In this procedure skin epidermis along with variable thickness of dermis is harvested from one part of body and is applied on wound present on other parts of body. Split skin graft (SSG) can be harvested from any part of body according to color, texture thickness of dermis and donor site morbidity. Scalp, abdominal wall, buttocks and thighs are common SSG donor sites<sup>1</sup>. The SSG donor site heals by re-epithelialization (migration of epidermal cells from remnants of dermal adnexa across the wound) taking 10-14 days in normal settings. Healing of donor site occurs in early exudative phase and later dry phase requiring absorbent dressing initially followed by non-adherent dressing after 72 hours. During healing, it is often more painful due to exposed nerve endings than the recipient site<sup>2</sup>.

The success of healing is highly dependent on the properties of the wound cover, especially its ability to support keratinocyte proliferation and differentiation<sup>3</sup>. An ideal dressing should be non-toxic, elastic, moderately adherent, take shape of the wound, maintain moisture and pH of wound and avoid infection. To promote SSG donor site healing, various types of dressings are in use. Conventionally, graft donor site is covered with medicated paraffin gauze dressing with layers of gauze to absorb the exudate. It adheres to the wound bed initially and then separates once wound is healed completely. This dressing is left in place for variable periods of time. It is bacteriostatic and has shown very low potential of keratinocyte stimulation in vitro. Change of this dressing in early post op period is very painful for the patient and destructive for newly formed epidermis. A sophisticated synthetic material like Suprathel is a microporous, absorbable polymer of lactic acid, known for its ability to stimulate growth of keratinocytes, biocompatibility and spontaneous detachment without need for change of dressing avoiding damage to newly formed epidermis. It provides moist healing environment which allows autolytic debridement of wound. Its use in partial thickness burn has shown promising results.

A prior study showed that Suprathel significantly reduced wound pain with dressing change and was associated with favorable scar formation in partial thickness burn patients<sup>4</sup>. In another study that compared Suprathel to other standard burn dressings showed no statistical significant difference in wound healing, scar formation and epithelialization<sup>5</sup>. Although, there are a number of reports comparing effect of different dressings with Suprathel dressing in partial thickness burn (which is similar to SSG donor site wound in terms of dermal thickness) yet, there is scarcity of studies showing such comparisons for SSG donor site. Therefore, rationale of this study is to compare the conventional dressings with Suprathel dressing in terms of pain control and duration of wound healing at graft donor site. The technique with less requirement of analgesia and high percentage of wound healing will be preferred.

The objective of the study was to compare conventional dressing and Suprathel dressing at SSG donor site in terms of total consumption of analgesic medication and duration of wound healing.

## MATERIAL AND METHODS

After permission from Institutional Ethical Review Board, this study was conducted in Department of Plastic and Reconstructive Surgery / Burn unit of Mayo Hospital over a period of 1 year (Dec 2020 – Dec 2021) to see the impact of Suprathel Dressing at split skin Graft donor site for pain control and wound healing. Inclusion criteria: Patients of either gender between the age of 14 – 60 yrs undergoing split skin grafting for wound coverage. Exclusion criteria: Patient with age  $\leq 14$  and  $\geq 60$  years and patients in which donor sites has been previously harvested were not included in the study.

Total of 64 patients were included. They were randomly allocated in 2 groups: Group A (conventional) and Group B (Suprathel). In Group A conventional topical dressing was done with paraffin medicated gauze. Assessment of wound healing was done by changing the dressing on 7 post op day.(fig 1). In group B, suprathel was applied directly on donor site covered by paraffin and cotton gauze layer. Donor site was assessed after 48hrs and

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detachable dressing part was trimmed till complete healing occurs (Fig. 2).

Pain score was determined by NVAS (Numeric visual analogue score) 3- times a day and 1/v tramadol injection was given to the patient. Daily requirement of analgesic medication was noted for first 3 days and their total dose was calculated. All the patients were assessed for wound healing using Transparent graph paper.

Figure 1: Conventional group – Paratulle dressing on graft donor site a) Immediately after graft harvest b) Day 7 c) Day 14 – Complete wound healed



Figure 2: Suprathel dressing group; a) Suprathel application per op, b) Day 6 --Trimming of suprathel on healed area c) Day 8 -- suprathel trimming, d) Day 10 – complete wound healing



Data was analyzed using software SPSS version 21. Qualitative data like wound healing and gender is presented in the form of frequency and percentage. Quantitative data like means of age of patients and consumption of analgesic medication is presented in the form of mean± S.D.T-test for comparing total analgesic dose while Chi-square test was used to compare wound healing in both groups. P- value ≤ .05was considered significant.

**RESULTS**

A total of 64 patients were included in study 32 in each group. It included 35 (54.7%) males and 29 (45.3%) female patients. Mean age was 38.56± 12.1. 14 patients (21.9%) had <30<sup>2</sup>, 31(48.8%) had between 31-60 in<sup>2</sup>, 19 (29.7%) had > 61 in<sup>2</sup> total surface area of graft donor site (Table 1). Graft donor site was Right thigh in 53.1% cases, left thigh in 37.5%, right arm in 4.7% and left arm in 4.7%. PAIN SCORE: In conventional group A, there were 11(34.4%) patients with pain score ≤ 5 (Mean±SD - 3.63±0.88) and 21 (65.5%) with pain score ≥5 (Mean ±SD - 7.47± 0.95). In group B, there were 22 (68.8%) with pain score ≤5 (Mean±SD- 3.68±0.81) and 10 (31.2%) ≥ 5 (Mean ± SD - 7.3±1.1).

**Analgesia Requirement:** In group A, 3 patients (9.4%) required ≤ 30 mg (Mean±SD -23.3±4.71), 10 patients (31.2%) required between 30 – 60mg (Mean±SD - 48±7.48) and 19 patients (59.4%) required > 60mg of analgesia (Mean ± SD - 98 ±15.03). In group B, 14(43.7%) required < 30 mg (Mean±SD -19.2±7.03), 15(46.9%) between 30 – 60 mg (Mean ±SD- 50±7.30) and 3 (9.4%) > 60mg of analgesia (Mean± SD- 96.6± 16.9).

**Healing time:** In group A, 17 patients (53.1%) had <14 days healing time (Mean ± SD -11.1±2.56) and 15(46.9%) had >14 days of healing time (Mean±SD- 17.4±1.62). In group B, 25 patients (78.1%) had <14 days (Mean ±SD - 11.6±2.36) and in 7 (21.9%) > 14 days Mean±SD - 17.1±1.24) healing time (Table 2).

Table 1: Clinical characteristics.

Patient characteristics	Group A (%) Conventional dressing	Group B (%) Suprathel dressing	Total (%)	P value
Patient Number	32 (50)	32 (50)	64 (100)	
Age of Patient				
14-37 years (n=37)	18 (56.2)	19 (59.4)	37 (57.8)	0.8
38-60 years (n=27)	14 (43.8)	13 (40.6)	27 (42.2)	
Males	17 (53.1)	18 (56.2)	35 (54.7)	0.8
Females	15 (46.9)	14 (43.8)	29 (45.3)	
Per-op data				
Total surface area of graft donor site (in. <sup>2</sup> ):				
≤30	5 (15.6)	9 (28.1)	14 (21.9)	0.028
31- 60	15 (46.9)	16 (50)	31 (48.4)	
>61	12 (37.5)	7 (21.9)	19 (29.7)	
Graft donor site:				
Right thigh	21 (65.6)	13 (40.6)	34 (53.1)	0.15
Left thigh	8 (25)	16 (50)	24 (37.5)	
Right Arm	2 (6.3)	1 (3.1)	3 (4.7)	
Left Arm	1 (3.1)	2 (6.3)	3 (4.7)	

Table 2: Outcome of Conventional and Suprathel dressing groups

Characteristics	Group A		Group B		Total (%)	P value
	N (%)	Mean±SD	N (%)	Mean±SD		
Pain score						
≤ 5	11 (34.4)	3.63±0.88	22 (68.8)	3.68±0.81	33 (51.6)	0.005
> 5	21 (65.6)	7.47±0.95	10 (31.2)	7.3±1.1	31 (48.4)	
Analgesic requirement (mg)						
≤ 30 mg	3 (9.4)		14 (43.7)	19.2±7.03	17 (26.5)	0.000
30-60 mg	10 (31.2)	23.3±4.71	15 (46.9)	50±7.30	25 (39.1)	
>60 mg	19 (59.4)	48±7.48	3 (9.4)	96.6±16.9	22 (34.4)	
Days required for complete wound healing		98±15.03				
< 14 days	17 (53.1)	11.1±2.56	25 (78.1)	11.56±2.36	42 (65.6)	0.03
> 14 days	15 (46.9)	17.4±1.62	7 (21.9)	17.1±1.24	22 (34.4)	

## DISCUSSION

Split thickness skin Graft is commonly used reconstructive technique for wound coverage. Donor site wounds are rather clean wounds and are created under controlled and sterile condition. These wounds are a challenge for patient during and after healing. Healing of donor site has an impact on recovery of patient. Depending upon thickness they should heal by 7-14 days<sup>6</sup>. These wounds must be medicated to allow rapid healing<sup>7</sup>. Skin graft harvesting results in large open wound which can be very painful. While selecting an ideal dressing goal should be to use a dressing which promotes re-epithialization, reduce patient's discomfort and minimize pain, easy to handle and scar formation<sup>8</sup>. Numerous new dressings have been developed during last decades especially moist-retentive dressings<sup>9</sup>.

We conducted Randomized control trail in Department of plastic/ Reconstructive surgery/ Burn unit Mayo Hospital over a period of 1 year (Dec 2020 – Dec 2021) comparing the effectiveness of suprathel and conventional dressing on donor site for graft in relation to pain and healing time . We found that patients treated with suprathel have less analgesic consumption and earlier healing time.

In a study by H Schwarze et al<sup>10</sup> comparing effect of suprathel and Jelonet on donor site wound healing and pain there was no difference healing time and re-epithialization but significantly lower pain score for patients with– Suprathel dressing (P = .002). C. Uhlig et al compared Superathel with paraffin guaze intra individually on split thickness skin graft donor site. Suprathel significantly reduces pain on donor site and easy handling of dressing. In another study Melipex was used at donor site<sup>11</sup>. According to this study there was significant reduction in pain (.001) but epithialization was not affected. In a study by Harding et al moist dressings reduce pain and enhance healing<sup>12</sup>.

In a study by T.Hakkaranian some patients treated by Suprathel had irritation on donor site but no such thing was seen in our patients<sup>13</sup>. Our study shows significant reduction in pain at donor site and also enhanced re-epithialization in patients where Suprathel was used at donor site. FEE Brolmann<sup>14</sup> compared 6 different dressings in RCT and found hydrocolloid dressings having better results  $p < .001$  for healing and  $p = .038$  for pain.

**Limitations and Strengths:** Prospective Study so all the data was collected from the patients and wound healing was monitored directly. Limitation is that Suprathel is less cost-effective so its use depends upon its availability. But significant pain reduction, enhancement of wound healing and patients comfort makes it a reliable dressing. There are number of studies comparing Suprathel with other dressings in partial thickness burn but there are few studies in relation to donor site. In future, there is need of doing further studies comparing different type of dressing for donor site wound healing.

## CONCLUSION

Suprathel enhances wound healing in SSG donor site. It decreases pain, has excellent wound attachment and better patients comfort. It detaches automatically from wound not damaging re-epithialization and pain free removal. It becomes transparent during the healing process so makes it easy to monitor wound.

**Conflict of interest:** Nil

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