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ORIGINAL RESEARCH

Collagen and paraffin gauze dressing over donor site wound in split skin grafting (SSG): Assessment of pain (VAS), pruritus and duration of need of analgesics

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ABSTRACT

Local care and management of donor site wound (DSW) should be aimed at creating an environment which promotes early epithelialisation with minimal pain and discomfort to the patient with reduction in duration of hospital stay. Though the procedure of split skin grafting is more or less standardized, management of donor site wound greatly differs and is a debatable topic. The cases are assessed according to the objectives like Rate of Epithelialisation, pain, pruritus, need of analgesia post-operatively. All the patients were explained about the basis of the study and informed consent is obtained. According to wilcoxon matched pairs test, group A showed mean difference of 1.77 and SD difference of 0.65 on post-operative day 1 compared with post-operative day 3 pain with 'p' value of 0.0001 which is statistically significant. Group B showed mean difference of 0.51and SD difference of 0.89 on post-operative day 1 compared with post-operative day 3 pain with 'p' value of 0.0077 which is statistically significant.

Key words: Collagen and paraffin gauze dressing, split skin grafting (SSG), assessment of pain

INTRODUCTION

The donor site wound (DSW) usually receives minimal attention and pose a kind of burden to patients during and after the process of wound healing and is often associated with enormous pain, and are at risk of getting infected, can cause itching (pruritus) and cosmetic inconvenience to the patient[1].

Local care and management of donor site wound (DSW) should be aimed at creating an environment which promotes early epithelialisation with minimal pain and discomfort to the patient with reduction in duration of hospital stay. Though the procedure of split skin grafting is more or less standardized, management of donor site wound greatly differs and is a debatable topic[2].

To overcome this problem, a variety of materials and products have been recognised for dressing and care of donor site wound (DSW), most commonly employed dressing is using a fine meshed gauze which is smeared commonly with petroleum jelly. This smeared wet gauze provides an environment which is moist initially and dries up later to become desiccated and results in the formation of eschar which in turn restricts and impairs cellular migration by acting as a mechanical barrier. But if dressings of this kind get soaked through their thickness due to wound discharge, it will become a media for bacterial invasion[3,5].

Experiments which have been done in the recent past have been shown that the use of biological dressings will create a natural and physiological interface between environment and the surface of the wound thereby permitting the body immunological and repair system to function most effectively. These dressings are more natural, least allergenic and non-pyrogenic[5].

Collagen can be used as a natural material for wound dressing and it has certain specific actions that artificial materials for wound dressings do not have. Collagen dressings can provide anti-inflammatory, analgesic, anti-fibrotic and anti-infective properties. It will also speed up the process of neo-angiogenesis. The use of collagen sheets for dressing of donor site

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wound is very close to being called as an ideal donor site wound (DSW) dressing[6].

METHODOLOGY

The study was conducted over patients who are admitted in department of general surgery for split skin grafting, during the study period.

METHOD OF COLLECTION OF DATA

The cases are assessed according to the objectives like Rate of Epithelialisation, pain, pruritus, need of analgesia post-operatively. All the patients were explained about the basis of the study and informed consent is obtained.

The patients are selected based on the following inclusion and exclusion criteria.

STUDY DESIGN: Prospective study.

SAMPLE SIZE: 70 patients of either sex between age group 18 to 65 years undergoing split skin grafting for any reason were divided into two groups of 35 patients each who fulfilled the inclusion and exclusion criteria, according to flow chart mentioned below.

INCLUSION CRITERIA

1. Donor site wound (DSW) after taking split skin graft (SSG) for any indication.
2. Minimum size of donor site wound (DSW) should be 15*10cm.

EXCLUSION CRITERIA

1. Age < 18years and >65years
2. Patients who are not candidates for split skin grafting for any reason.
3. Patients who may require a combination of grafts i.e. split-thickness + full-thickness grafts.
4. Size of donor site wound less than 15 * 10cm.
5. Patient refusal.
6. Morbid illness interfering with healing like:

a) Immuno-compromised state
b) Malignancy, local irradiation
c) Uncontrolled diabetes mellitus
d) Collagen vascular disease
e) Severe anaemia and hypo-proteinaemia.

7. Hypersensitivity to collagen.

The patients fulfilling these criteria are selected and assessed with pre-formed questionnaire and clinical examination. The following investigations are carried out in each of the patients.

1. Routine haematological and pre-operative investigations including blood counts and haemoglobin level.
2. Serum albumin levels.
3. Hba1c levels.
4. HIV and HbsAg

The serum albumin and blood haemoglobin level were carried out using the standard techniques available in the hospital laboratory.

All the wounds were prepared pre-operatively for grafting. This included debridement, administration of antibiotics, regular dressings till the wound is covered with healthy granulation tissue.

RESULTS

In our study of 70 participants, post-operative pain is assessed between two groups with 35 patients each (group A as control with paraffin gauze dressing and group B as case with collagen dressing) at different time points i.e. on post-operative day 1, post-operative day 3 and post-operative day 5 using visual analogue scale scoring 0-10 by Mann-Whitney U test.

On post-operative day 1, group A showed mean 2.7. SD 1.2 & median 2.0 compared to group B showing mean 0.5, SD 0.9 & median 0.0 with p value of 0.0001 which is statistically significant.

On post-operative day 3, group A showed mean 0.9, SD 1.1 & median 0.0 compared to group B showing mean 0.0, SD 0.0 & median 0.0 with ‘p’ value of 0.0020 which is statistically significant.

On post-operative day 5, group A showed mean 0.5, SD 0.9 & median 0.0 compared to group B showing mean 0.0, SD 0.0 & median 0.0 with ‘p’ value of 0.0643 which is statistically insignificant.

According to wilcoxon matched pairs test, group A showed mean difference of 1.77 and SD difference of 0.65 on post-operative day 1 compared with post-operative day 3 pain with ‘p’ value of 0.0001 which is statistically significant. Group B showed mean difference of 0.51and SD difference of 0.89 on post-operative day 1 compared with post-operative day 3 pain with ‘p’ value of 0.0077 which is statistically significant.

Group A showed a mean difference of 2.17 and SD difference of 0.75 on post-operative day 1 compared with post operative day 5 pain with ‘p’ value of 0.0001 which is statistically significant. Group B showed a mean difference of 0.51 and SD difference of 0.89on postoperative day 1 compared with post operative day 5 pain, with ‘p’ value of 0.0077 which is statistically significant.

Group A showed a mean difference of 0.40 and SD difference of 0.81 on post-operative day 3 compared with post-operative day 5 pain, with ‘p’ value of 0.0180 which is statistically significant. Group B showed no mean or SD difference.

On line graph analysis, there is a significant reduction in post-operative pain in initial period of collagen dressing compared to paraffin gauze and later remains static.

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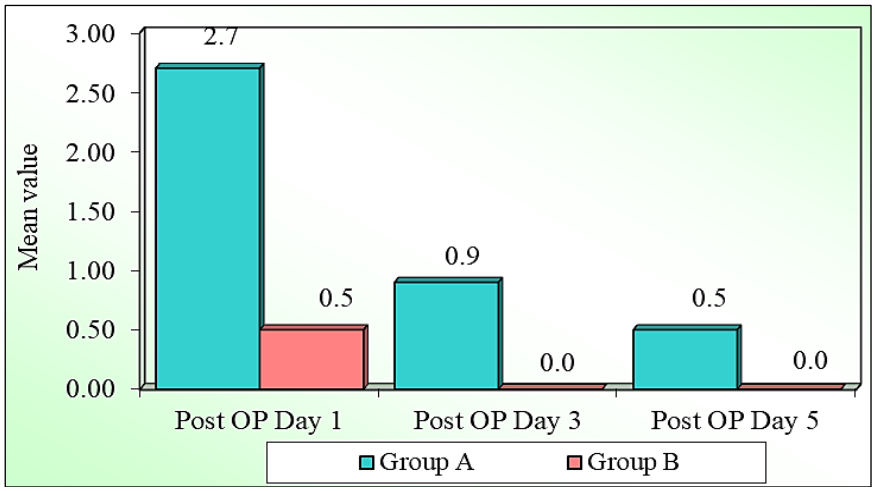
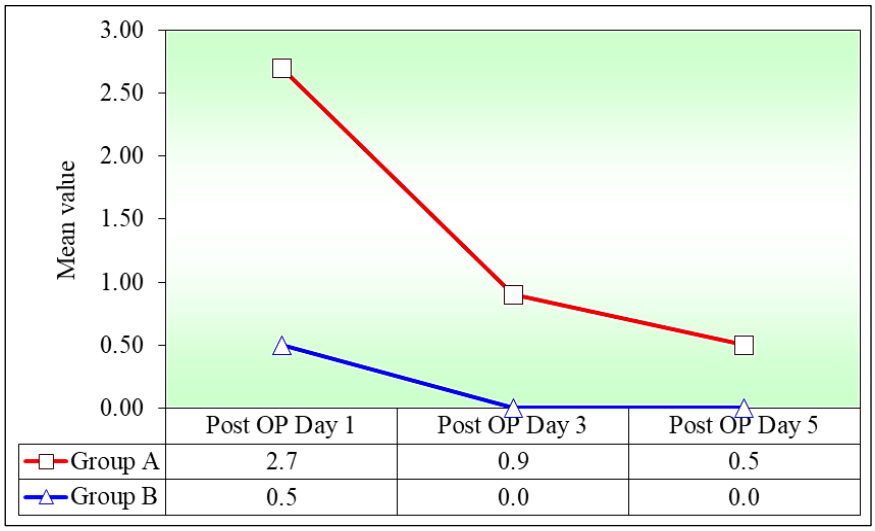
Table 1: Comparison of Group A and Group B with VAS scores for PAIN at different time points by Mann-Whitney U test

Time points	Group A				Group B				U-value	Z-value	p-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR			
POD 1	2.7	1.2	2.0	1.0	0.5	0.9	0.0	1.0	121.0	-5.7732	0.0001*
POD 3	0.9	1.1	0.0	1.0	0.0	0.0	0.0	0.0	350.0	-3.0833	0.0020*
POD 5	0.5	0.9	0.0	1.0	0.0	0.0	0.0	0.0	455.0	-1.8500	0.0643
Changes from Day 1 to day 5	1.8	0.6	2.0	0.0	0.5	0.9	0.0	1.0	227.5	-4.5222	0.0001*
Changes from Day 1 to day 4	2.2	0.7	2.0	0.0	0.5	0.9	0.0	1.0	157.0	-5.3503	0.0001*

*p<0.05.



Graph 1: Comparison of Group A and Group B with VAS scores for PAIN at different time points by Mann-Whitney U test



Graph 2: Comparison of Group A and Group B with VAS scores for PAIN at different time points

Table 2: Comparison of different time points with pain scores in Group A and Group B by Wilcoxon matched pairs test

Groups	Time points	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of effect	Z-value	p-value
Group A	Day 1	2.69	1.18					
	Day 3	0.91	1.12	1.77	0.65	65.96	4.8599	0.0001*
	Day 1	2.69	1.18					
	Day 5	0.51	0.89	2.17	0.75	80.85	5.0862	0.0001*
	Day 3	0.91	1.12					
	Day 5	0.51	0.89	0.40	0.81	43.75	2.3664	0.0180*
Group B	Day 1	0.51	0.89					
	Day 3	0.00	0.00	0.51	0.89	100.00	2.6656	0.0077*

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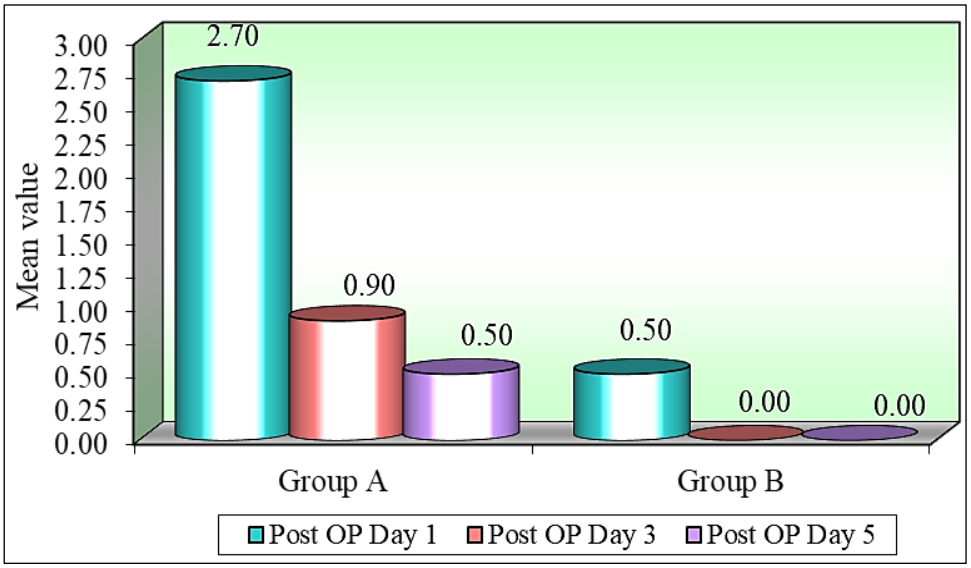
	Day 1	0.51	0.89					
	Day 5	0.00	0.00	0.51	0.89	100.00	2.6656	0.0077*
	Day 3	0.00	0.00					
	Day 5	0.00	0.00	0.00	--	--	--	--

*p<0.05.



Graph 3: Comparison of Group A and Group B with VAS scores for PAIN at different time points

In our study of 70 participants, pruritus is assessed between two groups with 35 patients each (group A as control with paraffin gauze dressing and group B as case with collagen dressing) at different time points i.e. on post-operative day 1, post-operative day 3 and post-operative day 5 using visual analogue scale scoring 0-10 grading as mild, moderate, severe or very severe by Mann-Whitney U test.

On post-operative day 1, group A showed mean 1.3, SD 0.6 & median 1.0 compared to group B showing mean 0.1, SD 0.3 & median 0.0 with 'p' value of 0.0001 which is statistically significant.

On post-operative day 3, group A showed mean 0.4, SD 0.6 & median 0.0 compared to group B showing mean 0.0, SD 0.0 & median 0.0 with 'p' value of 0.0075 which is statistically significant.

On post-operative day 5, group A showed mean 0.1, SD 0.3 & median 0.0 compared to group B showing mean 0.0, SD 0.0 & median 0.0 with 'p' value of 0.4110 which is statistically insignificant.

After both statistical analysis, difference was highest between two groups in first three post-operative days and later remains the same.

Table 3: Comparison of Group A and Group B with PRURITUS scores at different time points by Mann-Whitney U test

Time points	Group A				Group B				U-value	Z-value	p-value
	Mean	SD	Median	IQR	Mean	SD	Median	IQR			
POD 1	1.3	0.6	1.0	0.5	0.1	0.3	0.0	0.0	79.0	-6.2665	0.0001*
POD3	0.4	0.6	0.0	0.5	0.0	0.0	0.0	0.0	385.0	-2.6722	0.0075*
POD 5	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	542.5	-0.8222	0.4110
Changes fromDay1-Day 5	0.9	0.3	1.0	0.0	0.1	0.3	0.0	0.0	122.5	-5.7556	0.0001*
Changes fromDay1-Day 4	1.2	0.5	1.0	0.5	0.1	0.3	0.0	0.0	87.0	-6.1726	0.0001*

*p<0.05.

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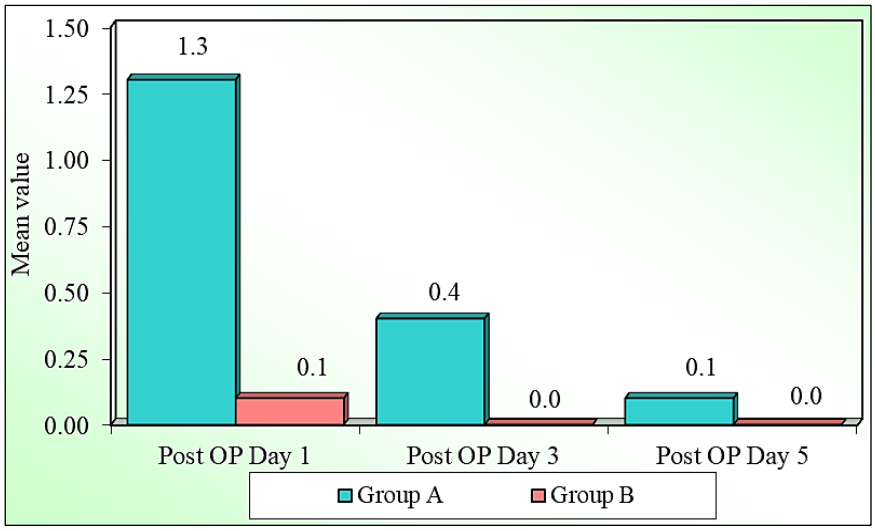
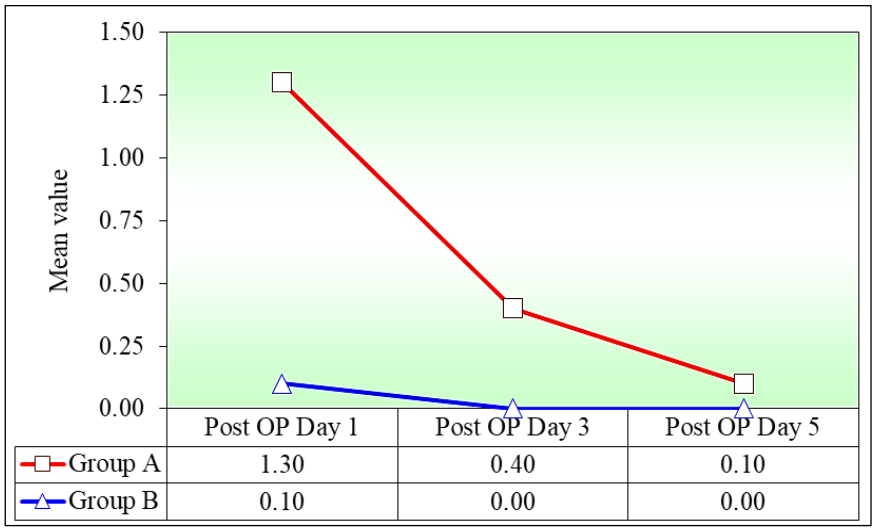


Graph 4: Comparison of Group A and Group B with PRURITUS scores at different time points by Mann-Whitney U test



Graph 5: Comparison of Group A and Group B with PRURITUS scores at different time points

Table 4: Comparison of different time points with PRURITUS scores in Group A and Group B by Wilcoxon matched pairs test

Groups	Time points	Mean	Std.Dv.	Mean Diff.	SD Diff.	% of effect	Z-value	p-value
Group A	Day 1	1.31	0.58					
	Day 3	0.40	0.55	0.91	0.28	69.57	4.9365	0.0001*
	Day 1	1.31	0.58					
	Day 5	0.11	0.32	1.20	0.53	91.30	5.0119	0.0001*
	Day 3	0.40	0.55					
	Day 5	0.11	0.32	0.29	0.46	71.43	2.8031	0.0051*
Group B	Day 1	0.11	0.32					
	Day 3	0.00	0.00	0.11	0.32	100.00	1.8257	0.0679
	Day 1	0.11	0.32					
	Day 5	0.00	0.00	0.11	0.32	100.00	1.8257	0.0679
	Day 3	0.00	0.00					
	Day 5	0.00	0.00	0.00	--	--	--	--

*p<0.05.

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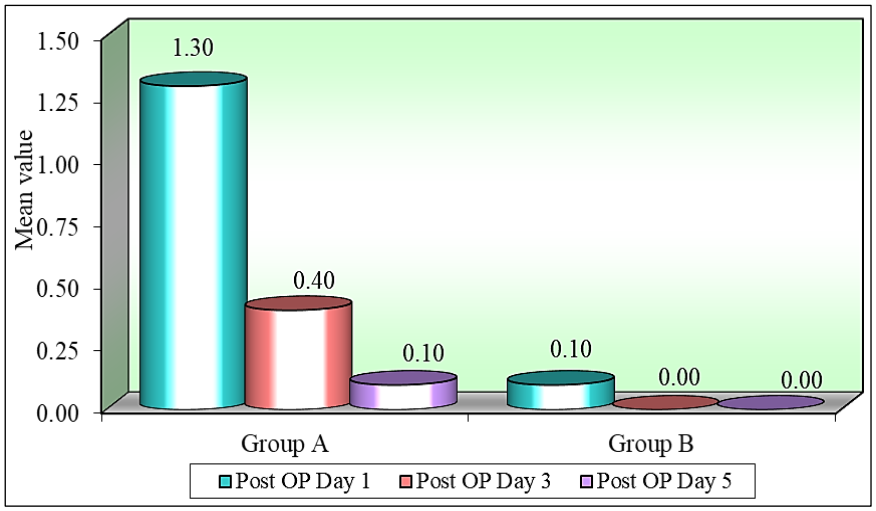

Graph 6: Comparison of different time points with PRURITUS scores in Group A and Group B

Out of 70 patients in our study with 35 in each group, 24 from group B has score 0 which means none of them required analgesia,21 from group A & 11 from group B had score 1 which means these required analgesia for 1-3 days.
2 from group A & 0 from group B has scored 2 which means these patients required analgesia for 4-10 days.
12 from group A & 0 from group B has scored 3 which means, these required analgesia for 11-14days.
None of them in both the groups scored 4 which means requirement of analgesia for more than 14days.

Table 5: Comparison of Group A and Group B with need for analgesic

Need for analgesic	Group A	%	Group B	%	Total	%
Score 0	0	0.00	24	68.57	24	34.29
Score 1	21	60.00	11	31.43	32	45.71
Score 2	2	5.71	0	0.00	2	2.86
Score 3	12	34.29	0	0.00	12	17.14
Total	35	100.00	35	100.00	70	100.00
Chi-square=0.0941 P = 0.7592						

DISCUSSION

Narayanathu*et al*. study of comparison between collagen dressing and paraffin gauze showed collagen reduces the pain at skin graft donor site.
BA Ramesh *et al*. study of comparison between collagen dressing and petroleum gauze dressing showed collagen reduces the pain at the donor area of skin graft[7].
In our study of comparison between collagen dressing and paraffin gauze dressing showed that collagen reduces the pain at skin graft donor site compared to paraffin gauze dressing.
Syed MahmoodAyaz*et al*. study shows that there is a significant reduction in pruritus with collagen dressing on post-operative day 1 and post-operative day 14 respectively.
In our study, collagen dressing shows significant reduction in pruritus compared to paraffin gauze dressing on post-operative day 1, 3 and 5 respectively.
Syed MahmoodAyaz et al study shows that there is a considerable reduction in use of analgesics especially opioids with collagen dressing and also reduction in the duration of use of analgesics was observed with collagen dressing[8].
In our study, there is reduction in the need of analgesia and its duration with collagen dressing than paraffin gauze dressing.

CONCLUSION

- Post-operative pain is less among cases than control on initial days later remains same.
- Pruritus is noted more among controls at different time points post-operatively than controls.
- Need of analgesia is more at different time points in controls than cases with duration being longer days among controls.

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