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## Effect of honey dressing in healing of split-thickness skin graft donor site

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**Abstract**

**Background:** Managing the donor site after harvesting a skin graft is a chief issue. There are various dressings available for the management of donor sites but there has not been a widely accepted method for these partial thickness grafts. Honey has been found to be useful in the treatment of wounds like burns for thousands of years, but only in recent times that a scientific explanation is available for its effectiveness. Split-thickness skin graft donor sites are comparable to partial thickness burn wounds.

**Methods:** In this study, the effect of honey on skin graft donor sites has been evaluated. 50 patients have undergone skin grafting for various reasons have been randomized into two groups of 25 each in honey-treated group and Vaseline gauze-treated group. In the group A, who were treated with honey, 85% of the patients had nil or only moderate pain, whereas in the group B, who were treated with Vaseline gauze, 80 % had nil or mild pain. On examining the donor site on the 7th day, epithelialization has occurred in 48 patients as compared to 39 in group B. By the 10th day, all the wounds healed in group A who were treated with honey, whereas 66 % of wounds healed in Vaseline gauze-treated group. At 1-month follow-up, the results were comparable in both groups, with regard to patient satisfaction.

**Conclusion:** Honey-impregnated gauze reduces pain and heals donor sites wounds quicker with better cosmetic result.

**Keywords:** Honey dressing, partial thickness skin graft, donor site, wound healing

**Introduction**

Skin grafting as a reconstructive technique with various benefits, like hastening the healing of burns, other wounds and correction of scar contractures. Skin grafts are used after serious injuries when part of the body's skin is damaged. There are well-known techniques for caring the skin graft site to promote wound healing. However, there has not been a well-accepted method regarding optimal donor site dressing which would result in best healing. The ideal dressing for a donor site would promote healing and more comfortable for the patient, resistant to infections and cost-effective. These dressings can be divided into moist and non-moist dressings. The main difference is that moist dressings can prevent exudate desiccation by retaining moisture [1]. Honey has been used for treatment of wounds since ancient Indian medicine. The use of honey or honey-impregnated gauze is a way of semi occlusive dressing. The osmotic effect of the sugar draws water out of the wound bed and, although it could be thought that this may potentially harm and dehydrate the wound tissue, this is not the case. If the circulation of blood underneath the wound is sufficient to replace fluid lost from cells, then the osmotic effect of sugar on the surface simply creates an outflow of lymph [2]. In the treatment of burn wounds, it has been shown that honey promotes wound healing, prevents infection, and lessens the pain during the change of dressing [3-6]. This randomized study was designed to compare honey-impregnated gauze dressings with paraffin gauze in skin graft donor sites with regard to healing time, infection rate, and patient comfort.

**Materials and Methods**

50 patients who underwent split-thickness skin graft for various causes during the period from July 2018 to April 2019 at Sri Devraj Urs medical college, Tamaka, Kolar were included in the study. Informed consent of the patients or parents in the case of children was obtained. Patients were randomised with 25 patients for group A and 25 patients for group B at the beginning of the study,

and the patients were allotted to either group (group A, honey treated; group B, Vaseline gauze treated) depending on which chit they pick up. A Humby's knife was used to harvest a 0.1-in. thickness skin graft from the thigh in all patients. In group A, honey-impregnated gauze was applied on the donor site. The microbiological tests for the honey were performed and no

microorganism colonization was seen. In group B, a sterile Vaseline gauze was applied. In both the groups, sterile cotton was applied and bandaged. The Patients were observed for exudation from the dressing, skin reactions, pain, epithelialization, and cosmetic appearance. Pain was assessed using Wong Bakers faces.

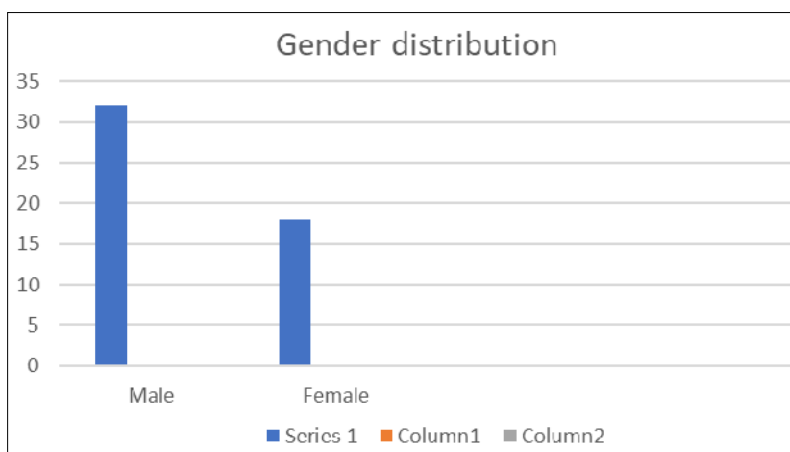


If there was clinical evidence of infection as evidenced by the discharge or the foul smell, the dressings were opened and new dressings were applied. In all the other wounds, the bandage was removed on 7<sup>th</sup> day in both the groups. The wounds were reassessed on the 10th day. The cosmetic appearance was assessed by asking the patient to grade the appearance of wound as one among the three grades-grade 1, satisfactory; grade 2, happy with cosmesis; and grade 3 as excellent when the appearance was as good as the normal skin. The grades of assessment as judged by the patients were recorded and the percentage of observation in each grade was calculated (Table 2). The data were analysed using chi-square test.

**Results**

Of the 50 patients who underwent skin grafting, 32 were males and 18 were females (chart 1). Patients were in the age group of 18–65 years (mean 32.3 years). The reasons for skin grafting were burns (18 patients) and chronic ulcers due to other causes (32 patients). The skin graft donor site area ranged from 30 to 48

cm<sup>2</sup>, mean 32.6 cm<sup>2</sup>. The assessment of pain using Wong Baker faces on Day 1, 3 and 5. In group A, treated with honey, 85 % of the patients had nil or only moderate pain, whereas in the group B, treated with Vaseline gauze, 80 % had nil or mild pain. There were no allergic reactions in any of the patients. On examining the wound on the 7th day, epithelialization has occurred in 23 patients as compared to 19 in group B, i.e., donor sites treated with Vaseline gauze, ( $p < 0.05$ , statistically significant). By the 10th day, all the wounds in group A are healed, those in honey-treated group, whereas 66 % wounds are healed in Vaseline gauze-treated group ( $p < 0.05$ , significant). The culture from donor site on the 7th day in both groups did not show the growth of any organisms. During the follow-up after 1 month, 22 patients from honey-treated group and 14 from Vaseline gauze-treated group could be examined, the rest of them were lost for follow-up. All the wounds healed in both the groups, the skin appearance as assessed by the patients or parents of children ( $p > 0.05$ , not significant). No complications like hypertrophied scar, in either group.



**Chart 1:** Gender distribution

**Table 1:** Pain Score at operative site comparison between two groups

Pain score at operative site	Group						P value
	Honey dressing			Vaseline dressing			
	Mean	SD	Median	Mean	SD	Median	
Day 1	6	2	6	7	1	7	0.033*
Day 3	4	1	4	5	1	4	0.013*
Day 5	2	1	2	3	1	4	<0.001*

**Table 2:** Assessment of patients or parents of children with regard to cosmesis of wound

	Grade A		Grade B		Grade C		Total
	No	%	No	%	No	%	
Group A, patients treated with honey group	4	9	7	21.7	12	69.5	23
Group B, patients treated with Vaseline gauze	3	13.6	5	30	11	68.1	19

Grade 1, satisfactory; Grade 2, happy with cosmesis; Grade 3, excellent when he or she felt the appearance was as good as the normal skin.

### Discussion

An ideal donor site dressing for a partial thickness skin graft should be easy to apply, provide rapid re-epithelialization, and be pain free, infection free, and relatively cost effective [7]. Most authors, however, prefer to protect the donor site wound from trauma and infection by covering it with low-adherent, Vaseline-impregnated gauze. These dressings can be divided into moist-like Tegaderm, Aquacel Ag and Kaltostat and non-moist dressings like scarlet red, Xeroform, Jelonet, etc. The main advantage of moist dressings is it prevents exudate desiccation by retaining moisture [7]. The use of honey-impregnated gauze allows the wound to remain moist, prevents infection, and promotes rapid epithelialization. A study by Potter (1998) also showed that epidermal migration on superficial wound will be faster in moist condition compared to dry conditions thus further develop the modern wound dressing method [8]. In the treatment of superficial and partial thickness burns, honey was found to heal the burns earlier than conventional dressing, with minimal scarring and lesser depigmentation [4, 5]. It is well known that topical acidification of wounds promotes healing by increasing the release of oxygen from haemoglobin [9]. In addition, this pH is less favourable for protease activity, thus reducing the destruction of the matrix needed for tissue repair [10]. In the present study, of paraffin gauze versus honey, epithelialization was faster with honey and pain was comparatively less when given more comfort to the patient. The components and features of honey are its viscosity, water content, sugars (primarily glucose and fructose), antioxidants, a wide range of amino acids, vitamins and minerals, glucose oxidase, which produces hydrogen peroxide and provides most of the antibacterial activity, and gluconic acid which gives honey an acidic pH of 3.2 to 4.5 [6]. In the group A, treated using honey, pain was less as compared to the Vaseline gauze-treated group as honey forms a thin layer over the wound, preventing the contact of the wound with air and reducing the pain. Rapid epithelialization and healing of graft sites earlier result in cost-effectiveness, which is an indirect evidence, makes honey a better choice of skin graft donor site dressings.

### Conclusion

The use of honey-impregnated gauze promotes better donor site healing following partial thickness skin graft; it is effective, contented for the patients, safe and results in admirable cosmetic result and makes honey an ideal dressing for skin graft donor sites.

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