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ORIGINAL RESEARCH

A comparative study between collagen dressings and conventional dressings in skin graft donor site healing

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Abstract

Introduction: The adequate management of the wound aims to facilitate the healing process and reducing complications taking into account patient's well-being during the treatment. Methods of treating donor site wounds are categorized as open, semi-open and closed. The purpose of this study was to compare the efficacy of the different materials

Material and Method: All skin grafts were taken from the anteromedial or anterolateral aspect of the thigh using Watson's modification of Hamby's knife set at 0.012inches thickness. To achieve the consistency of treatment harvesting was carried out in one-pass technique that was performed by the same surgeon. These patients were divided into 2 groups of 10 cases in each group according to the type of dressing material used

Result: At post op day 3, only 2 patients in group 1 had mild pain and rest of the patients were pain free while in group 2, 2 patients had mild pain , 5 patients had moderate pain and 3 had severe pain. This pain score was statistically significant.In group 1, the mean time for complete epithelialization was 10.9 days while in group 2, the mean time for complete epithelialization was 15.5 days which was statistically significant.

Conclusion: Collagen as dressing material significantly reduces pain at DSW and promotes early healing. Therefore, despite the high cost of collagen, it is still preferred over paraffin gauze.

Keywords: Split-thickness Skin Grafting, Donor SiteWound

Introduction

Skin grafting involves harvesting of the graft from one part of the body and transferring it to another part of the body. Split-thickness skin grafting (STSG) is a commonly used procedure in plastic surgery to replace the missing or damaged skin. The success of the procedure depends upon complete take up of the graft and complete re-epithelialization of the donor site.[1-3]The adequate management of the wound aims to facilitate the healing process and reducingcomplications taking into account patient's well-being during the treatment. Methods of treating donor site wounds are categorized as open, semi-open and closed.[4]In open method wounds are kept open and allowed to heal without a dressing. In semi-open methods wounds are dressed once and then left open to heal while in closed methods wound is left to heal

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under dressing left intact for 7 to 14 days. Closed method has been widely accepted method over the last decade.[5]

The ideal DSW (donor site wound) dressing does not adhere to the wound bed, facilitating removal. DSW dressing should be pain free, reduce blood loss and ideally should be changed infrequently until the wound has healed.[6] Among surgeons, a pain free dressing is the most consistently desired or essential quality of a wound dressing, in recognition of the fact that the DSW is often more painful than the recipient site.[7] The need for such a dressing is, if anything, more important as the data suggests that decreased pain leads to measurable clinically significant improvements in wound healing.[8,9] Additionally, rapid healing permits the repeat harvesting of donor areas in large burns and also decreases the risk of scarring.[10]

Paraffin gauze has been recognized as a standard treatment for dressing the split-thickness skin graft.[11] It is considered to be non-adherent but it adheres to the wound surface as it absorbs exudate and epithelialized surface may slough off, cause local pain and maceration of the wound.[12]Collagen dressing (biological dressing) on the other hand is impermeable to bacteria and create a more physiological interface between the skin and wound surface. It also has the advantage of being natural, easy to use, non-pyrogenic, non-immunogenic and pain free.[13]

The purpose of this study was to compare the efficacy of the different materials i.e. paraffin gauze and collagen sheets as dressing materials in split thickness skin graft donor site healing.

Material and methods

The study "A prospective study of different dressings in split thickness skin graft donor site healing" was carried out in the department of Surgery at Maharishi Markandeshwar University, Mullana, Ambala, from August 2015 for the period of 2 years. 20 patients admitted and treated by split thickness skin grafting in the Department of General Surgery, were included in the study. These patients were divided into 2 groups of 10 cases in each group according to the type of dressing material used.

Group 1 - Collagen sheet- 10 patients

Group 2 - Paraffin gauze- 10 patients

Inclusion criteria

All patients 18 years and above admitted in the surgical wards requiring split thickness skin graft

Patients having raw area secondary to trauma, infection, diabetic, venous ulcer, ischemic raw area and burns.

Patients with raw areas post debridement with healthy granulation with serous discharge.

Exclusion criteria

Immunocompromised patientson chemotherapy, corticosteroids, local irradiation therapy.

Patients with ulcers with slough, with unhealthy granulation & pus discharge.

Patients who are not willing for surgery.

Patients having active skin lesions over the donor site.

Second time grafting of same area.

All skin grafts were taken from the anteromedial or anterolateral aspect of the thigh using Watson's modification of Hamby's knife set at 0.012inches thickness. To achieve the consistency of treatment harvesting was carried out in one-pass technique that was performed by the same surgeon. All the patients were subjected to culture of pus/discharge from raw area to be grafted and grafting was done after the raw area was comparatively sterile.

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Data Evaluated in This Study

Pain Scores

Using a 10-Point Visual Analogue post-operatively where 0 represents no pain and 10 represents unbearable pain. Pain was recorded at 3rd, 5th, 7th post-operative day and at the time of removal of dressings. Same antibiotics were given to all patients.

Time Taken for complete epithelialization

Post Op Soakage of Donor Site Dressing

Cost-effectiveness

Total material costs including per unit cost of the dressing material and cost of additional dressing material required (cotton pads, bandages and adhesive tapes).

The aim of this study is to compare the efficacy of collagen sheet and paraffin gauze as a dressing material.

Statistical Analysis

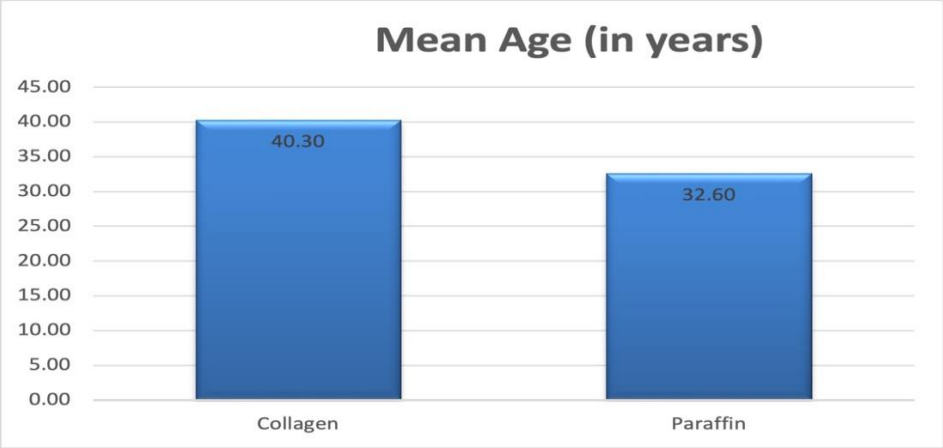
Software used to analyze and compute data was SPSS version 20.

Results

Mean age

In group 1 and group 2, mean age of the patients were 40.30 ± 13.01 years and 32.60 ± 14.09 years respectively.

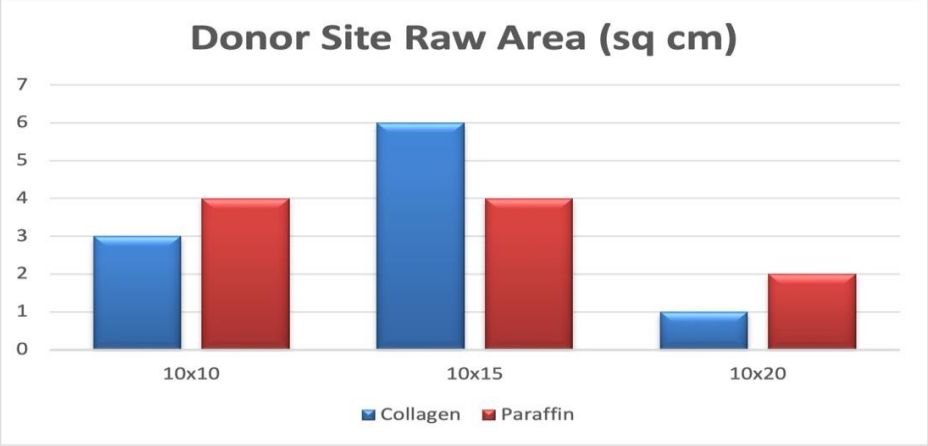
Graph-1: Mean age



Donor site area

The donor site area was comparable between both the groups.

Graph- 2: Donor site area



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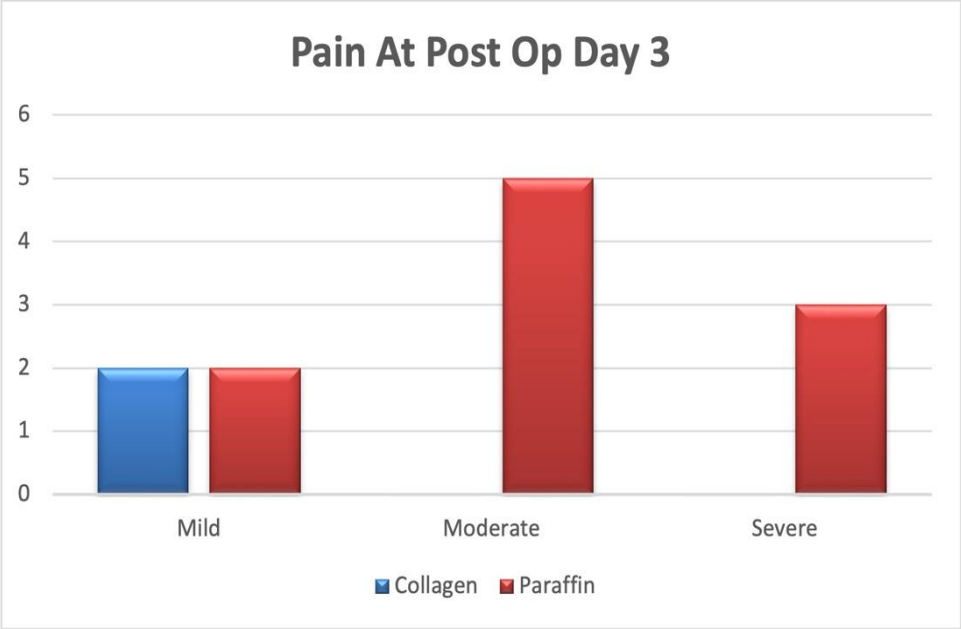
Pain on post op day 3

At post op day 3, only 2 patients in group 1 had mild pain and rest of the patients were pain free while in group 2, 2 patients had mild pain, 5 patients had moderate pain and 3 had severe pain. This pain score was statistically significant.

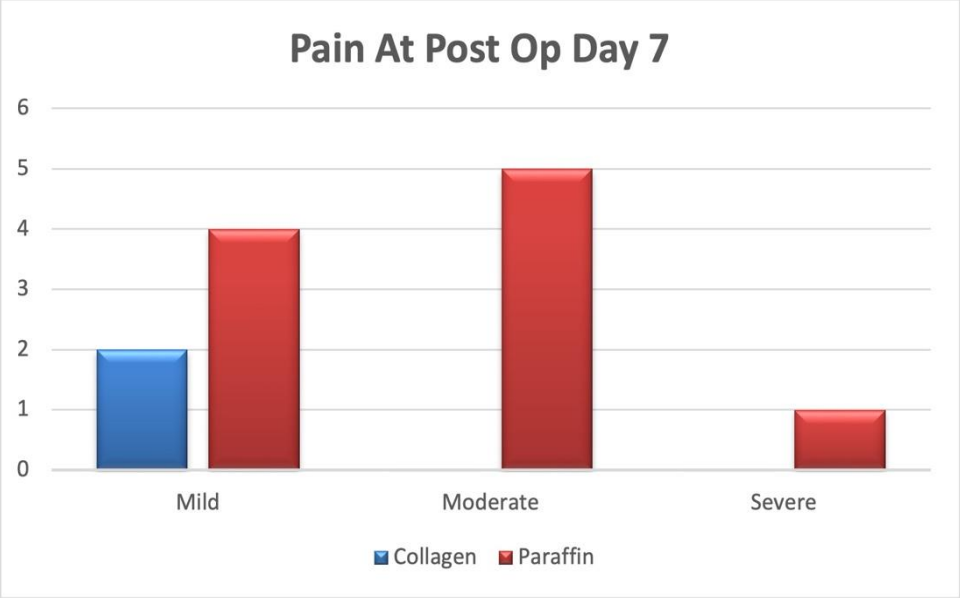
Graph- 3: Pain at post op day 3



Pain on post op day 7

At post op day 7, only 2 patients in group 1 had mild pain and rest of the patients were pain free while in group 2, 4 patients had mild pain, 5 patients had moderate pain and 1 had severe pain. This pain score was statistically significant.

Graph- 4: Pain at post op day 7



Pain at the time of dressing removal

At the time of dressing removal none of the patients experienced pain in group 1 while in group 2, 2 patients experienced mild pain, 5 had moderate pain and 3 had severe pain. This was highly statistically significant between the 2 groups.

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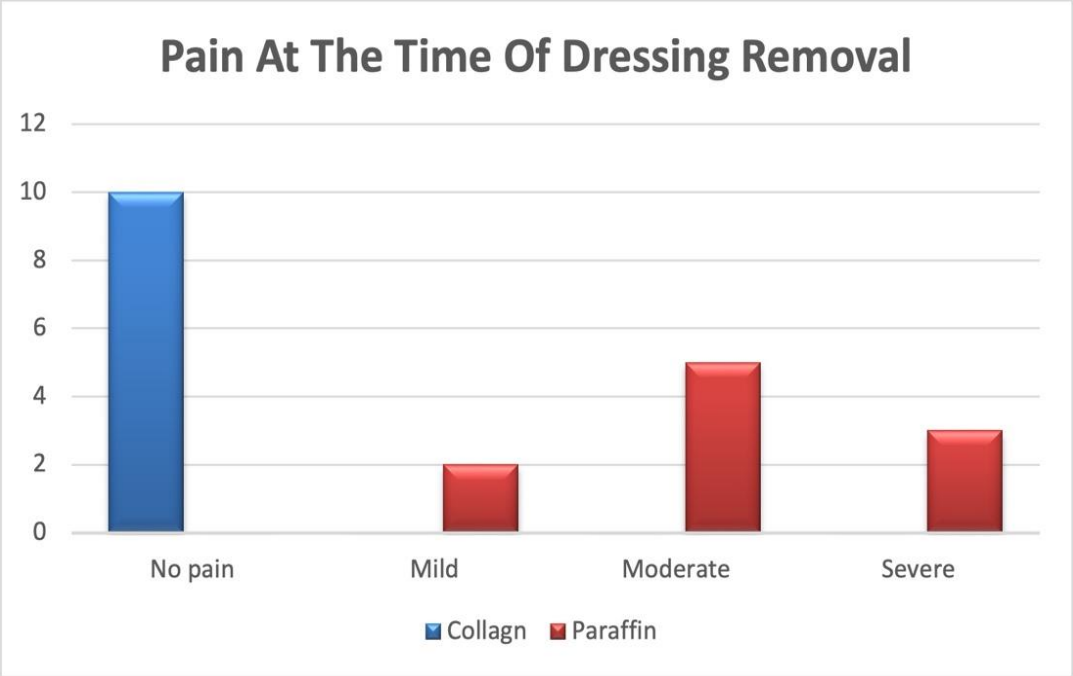
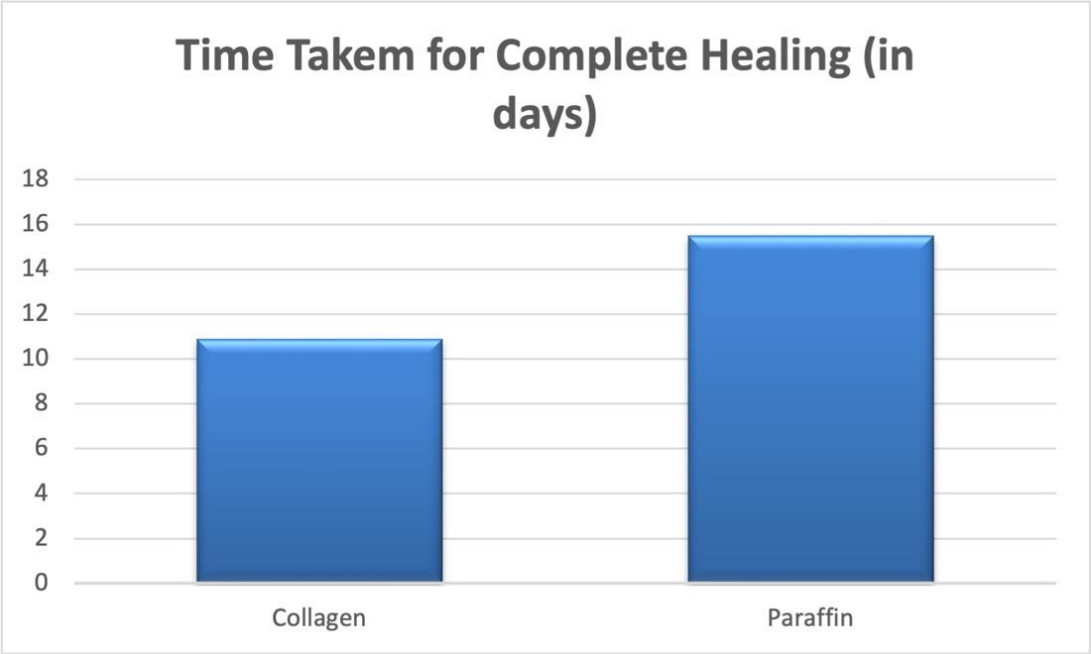
Graph- 5: Pain on removal of dressing



Time Taken For Complete Epithelialization

In group 1, the mean time for complete epithelialization was 10.9 days while in group 2, the mean time for complete epithelialization was 15.5 days which was statistically significant.

Graph- 6: Time taken (in days)for complete healing.



Post Op Soakage of donor site dressing

None of the patients in collagen showed any signs of soakage while in group 2, 2 (20%) patients had soakage within 48 hours post-operatively and the result was statistically **significant** (**p<0.05**).

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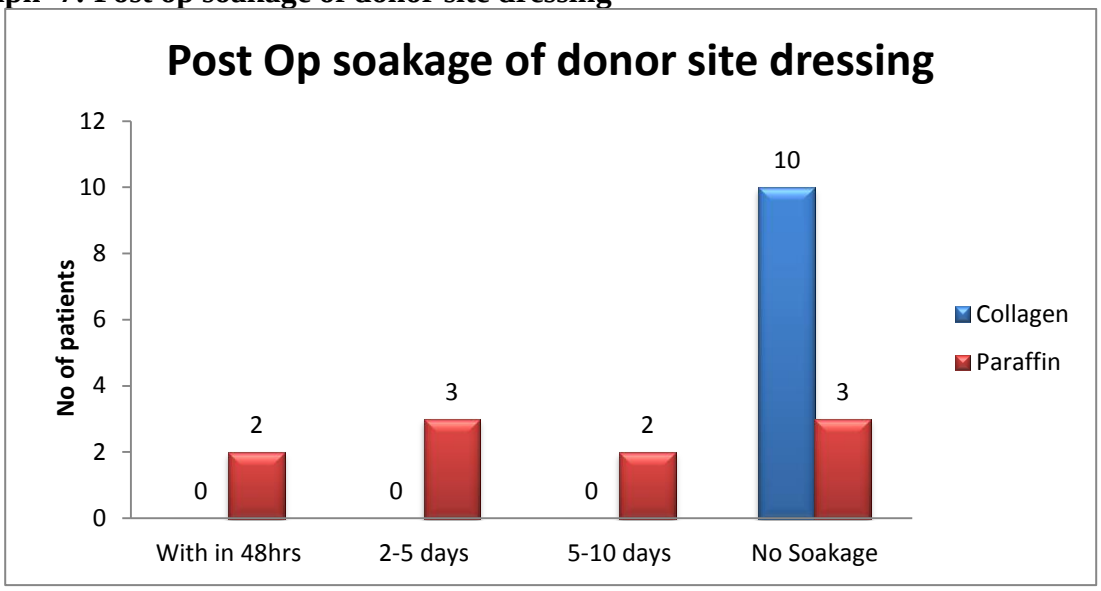
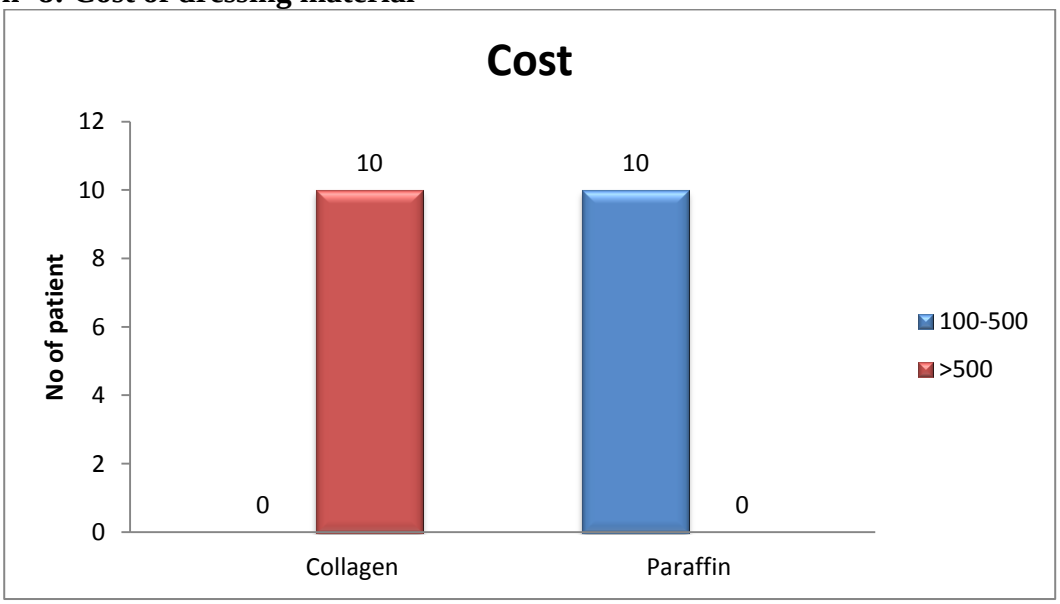
Graph- 7: Post op soakage of donor site dressing



Cost Of Dressing material

In group 1, the average cost of the dressing material was more than 500 rupees and group 2, between 100 to 500 rupees.There was statistical **significance** in cost of dressing material, collagen was the most expensive.

Graph- 8: Cost of dressing material



Discussion

Pain at the donor site is the most common complaint of the patient after split thickness skin graft and an ideal dressing material should provide pain relief post- operatively. Through-out our study there was significant difference in pain experienced by patients treated with collagen and paraffin gauze ($p<0.05$). In present study the mean healing time for patients treated with collagen was 10.9 days as compared to 15.50 days in paraffin gauze. This was highly significant.**Ponten B at el[9](1976)** studied the use of collagen as dressing material and reported mean day of healing of 12.8 days. This was in accordance to our study. **Horch RE et al[10](1998)** compared collagen with polyurethane film and observed mean day of healing in

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collagen group was 7.9 days. It was significant than the rate of healing in our group. In our study we observed that there was no soakage in the collagen group and soakage was present in 60% of the cases in paraffin group leading to increased number of dressings change in this group. We also observed that dressing was mildly adherent and easy to remove in collagen group as compared to adherent paraffin gauze dressing leading to more time taken to remove the dressing. **Sreekumar NC et al[7](2015)** in their study reported similar findings of reduced soakage in collagen group leading to less number of dressings change as compared to other group. They suggested that collagen performs following functions throughout the four phases of wound healing.

In our study we observed collagen to be expensive as compared to paraffin gauze dressing.

Conclusion

Collagen as dressing material significantly reduces pain at DSW and promotes early healing. Therefore, despite the high cost of collagen, it isstill preferred over paraffin gauze.

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