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Research Paper

The Study of Effectiveness of Calcium Alginate Dressing Over the Split Thickness Skin Graft Donor Site Area of Patients

Medical Science

KEYWORDS : Calcium alginate dressings, split thickness skin graft, Donor site area

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ABSTRACT

Aim: Calcuim alginate dressings were used to clinical evaluation and effectiveness on the split thickness skin graft donor site area of patients. Methodology: : History taking, Clinical examination, Investigation, Treatment: pre operative and post operative, Post operative management, Histopathological examination of excised specimens of marjolin's ulcers were performed to the patients. Follow up the patients were a period of 3 months to 6 months. Observation: Observation was done for a period of 10th post operative days. Data was analyzed by MS Office software. Conclusion: calcium alginate dressings over donor site was quite easy, almost painless, removal was easy and minimal pain, minimal trauma to the newly epithelialized surface and rate of epithelialization was very high (72% patients) on 10th post operative days

INTRODUCTION

The persons have more risk for thermal burns due to industrialization and more use of electrical equipments which leads the increase challenge for management of burn.[1] The modern trend of early and complete coverage of the lost skin by split thickens skin homograft has further increased the challenges for management of recipient as well as of the donor site areas of the skin graft. [1]

Our study was primarily be focused on the management of the donor site area dressings which was primarily managed depend upon the personal choices of individual surgeon. Some of them are mesh gauze dressings, poly urethane semi permeable transparent films, hydrocolloid dressings and retention dressing etc.

Post operative patients may complain pain over the donor site area by the use of these conventional dressings, and soakage from the dressings with oozing from the donor bed is another problem. By applying these type of dressings healing of the donor site area takes a long time and sometime it is unpredictable, removal of the dressings are difficult and almost adherent to the bed and removal is uneasy and painful to the patient.[2]

Alginate dressings form a gel like layer when in contact with moist wound providing moist environment for healing. This gel like layer over the donor site protects the epithelializing wound from trauma and from drying.[3]This may be the reason behind early and better epithelialization of the donor site with alginate dressings.

Our study was to evaluated the clinical effectiveness of calcium alginate dressing over the split thickness skin graft donor site area under these stages: 1. Post operative dressing soakage. 2. Post operative pain, 3. Healing time, and 4. Ease of dressing removal.

A moist environment was also used to promote healing by dressing with calcium alginate, which possesses hemostatic property.

MATERIAL & METHODS

A total of 50 patients with varied clinical conditions like post burn contractures, chronic non healing ulcers, Marjolin's ulcer etc on the basis of inclusion criteria were selected. This study was done in department of Surgery, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India between may 2005 to may 2007 . Patients were carried for primary management of acute burn and who required split thickness skin graft over the raw body. The attendant of entire subjects signed an informed consent approved by ethical committee of Darbhanga Medical College, Darbhanga, Bihar, India was sought.

Methodology: History taking, Clinical examination, Investigation, Treatment: pre operative and post operative, Post operative management, Histopathological examination of excised specimens of Marjolin's ulcers, Follow up the patients for a period of 3 months to 6 months.

Treatment:

Preoperative treatment:

Patients with chronic non healing ulcers and ulcers over burn scar were required initial treatment with antibiotics, multivitamins and antiseptic dressings till the lesions became clean and granulating.

Operative treatment:

When the patients were found to be fit for surgery on the basis of clinical examination, investigation and pre anaesthetic checkup then they were allowed for surgical procedure- viz. release of contracture, wide excision of the marjolin's ulcer, excision/scrapping of the chronic non healing ulcer followed by coverage of the raw area with split thickness skin graft.

Preoperative measures:

Light diet was given one day before from the date of surgery. A short acting mild sedative like alprazolam 0.25 mg was given in night before surgery. On the day of surgery in the morning proper shaving of the concerned parts of the body was done. Injection tetanus toxoid 0.5 ml was administered intramuscular over deltoid muscle. Half an hour before the surgery injection atropine or injection glycopyrolate intramuscularly and injection retidine 50 mg intravenously were administered. Patient was shifted to the operation theature. Injection ceftriaxone of proper dose was administered intravenously at the time of induction of anaesthesia.

Operative notes:

Proper painting and draping of the donor as well as the recipient sites were done. The primary pathologies e.g. post burn contracture, marjoline's ulcer, chronic non healing ulcer etc were dealt with first by relevant surgeries viz. release of the contracture, wide excision of ulcer or scraping of the wound etc. complete hemostasis of the recipient sites were achieved and covered with a sterile tetra. Then split thickness skin grafts were raised of a proper sizes from proper donor sites with the help of humbey's knife. Areas were covered with sterile tetras for the time being and the grafts were spread over the recipient sites,

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seroma holes were made and compression dressings applied.

On the donor sites the tetras were removed. Alginate fiber dressings soaked in normal saline were spread over the donor sites and occlusive dressings were applied. Compression bandages were applied. POP slabs if needed then it were applied.

After the completion of the procedure patients were shifted to the recovery room for 6 hours after which they were transferred to the respective wards. The excised specimens if any were sent for histopathological examination.

Post operative care, complications and their management:
After the completion of surgical procedure antibiotics cephalosporin, an aminoglycosides usually gentamycin and metronidazole were given regularly to the patients. IV fluids were given as per the requirement. Analgesics in the form of injections or oral were given regularly. H2 blockers were given regularly either intravenously or oral. Additional coverings of dressings were applied if more soakage from the donor site. Dressings of donor sites were remained intact until 10th post operative days.

Dressings were removed on 10th post operative day and observed for: ease of dressing removal, pain while dressing removal, donor site healing. Donor areas were reviewed weekly until fully healed.

Observations:
Data was analyzed by MS Office software. Study was done on the total of 50 patients required split thickness skin graft for varied pathologies like as post burn contracture, ulcer over old burn scars, chronic non healing ulcers of other etiology at Surgical ward of Darbhanga Medical College Darbhanga, Bihar, India.

Table: 1. Ease of dressing removal on 10th operative days.

S. No.	Ease of removal	No of patients	Percentage (%)
1.	Very easy (VE)	8	16%
2.	Quite easy (QE)	34	68%
3.	Not very easy (NE)	3	6 %
4.	Difficult (D)	2	4%
5.	Dressing adherent (Adh)	3	6%
total		50	100%

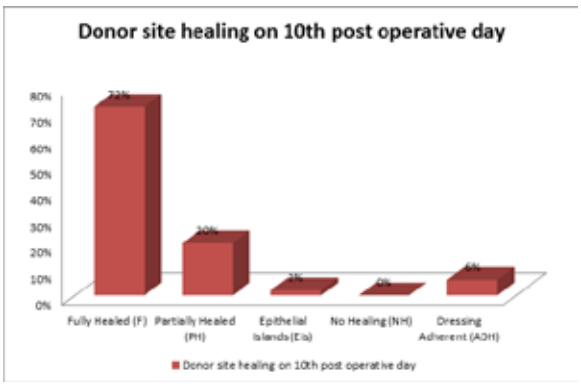
Table 1 showed that 84% dressings removal were easy. Three dressings were not removed as they were completely adherent to the wound bed. They were redressed and removed a week later.

Table: 2. Donor site healing on 10th post operative days

S. No.	Donor site healing area	No of cases	Percentage (%)
1	Fully healed	36	72%
2	Partially healed (PH)	10	20%
3	Epithelial islands (EIS)	1	2%
4	No healing	0	0%
5	Dressing adherent	3	6%
Total		50	100%

Table 2 showed that on 10th post operative day 72 % of cases healing were completed, 20 % cases wound were partially healed, 2 % cases were only epithelial islands present and 6 % cases dressing were completely adherent to the wound bed healing could not be assessed. The adherent dressings were left for another one week and at that wound showed completely epithelialization.

Figure. 1. Donor sites healing on 10th post operative day.



Discussion:
This present study was done in the department of surgery, Darbhanga Medical College and Hospital, Darbhanga, Bihar, India. We studied the effectiveness of alginate dressings over the donor site of total 50 patients requiring split thickness skin graft addressing ease of application, dressing soakage, pain at donor site with the alginate dressing in situ, ease of dressing removal, pain while dressing removal and donor site healing.

Our study was supported the study of Steenfos HH et al[4] (1998). They were studied on 17 patients and compared alginate dressings with conventional treatment on standardrized split thickness skin graft donor sites regarding initial absorption of blood and healing and found that the alginate dressing was increased initial blood absorption resulting in quicker hemostasis. Segal HC et al[5] (1998) were studied on the hemostatic properties of of alginate dressings. Their study also supported the present work.

In 41 patients application of alginate dressing were very easy (82%) and in 07 patients (14%) application were quite easy. That meant in 96% cases application of the dressing were easy in terms of handling and ease of application. In a few cases 02 patients (4%) application were not very easy. This could be because of the donor site e.g. gluteal region and inner aspect of thigh etc.

In 18 cases (36%) there were no dressing soakage and in 26 cases (52%) there were very minimal dressing soakage which was not require any further dressing reinforcement where as in 5 cases (10%) there were moderate dressing soakage which was required additional reinforcement dressings. In one case (2%) there was heavy soakage which was required replacement of the dressing.

Our study showed that the alginate dressings soakage were minimal in 88% of cases. It shown hemostatic property of the alginate dressing.

In five cases (10%) patients were not complain of any pain and visual analogue scale (VAS) for pain was zero while 36 cases (72%) were complained minimal pain (VAS = 01), 4 Cases (8%) were complained annoying pain (VAS=02), 2 patients (04%) were VAS= 03 and another 2 cases (4%) patients were VAS=04. No cases were any severe degree of pain.

While removing the dressings 03 patients (06 %) were no pain (VAS=0). 10 patients (20%) were minimal pain (VAS = 01), 18 patients (36 %) were annoying pain (VAS = 02) while 15 patients (30 %) were uncomfortable (VAS = 3 to 5). In three patients (6%) dressing were completely adhered to the wound bed and attempted removal produced agonizing pain (VAS = 10). So the dressings were not removed at that time. They were removed

subsequently after one week. In our study 72% of cases were minimal to mild pain during dressing removal.

Alginate dressings form a gel like layer when in contact with moist wounds e.g. a donor site area. This gel like layer prevents irritation of the raw nerve endings that are present at the post harvest donor site area[6] This may explain the pain reducing effect of alginate dressings.

Disa JJ et al[7] (2001) conducted a study and concluded that donor site discomfort was minimal with alginate dressings at the time of dressing change. They also reported that bio-occulusive dressing eliminated the pain typically associated with fine mesh gauze dressings.

Butler PE et al[8] (1993) reported the pain reducing effects of alginate dressing. According to them alone alginate dressings reduce pain, the best effects were obtained by alginate dressing moistened with bupivacaine hydrochloride (0.5%). Same effects was also found by Bettinger D et al[9] (1995) on the pain reducing effects of alginate dressings.

In our present study on 10th post operative day 08 patients (16%) removal of the dressing were very easy, 34 patients (68%) were quite easy, 3 cases (6%) removal were not very easy and 2 cases (4%) were difficult and in another three cases the dressing were completely adherent to the wound bed and attempted removal incited agonizing pain, therefore redressed and removed of dressings were done at after one week. Hence our study showed that in 84 % cases removal of the dressing were easy. In a few of cases 6% the dressing were completely adherents.

Bettinger D et al[9] (1995) was conducted a study on alginate dressings on burn patients with split thickness skin graft and concluded that alginate dressing was more beneficial over mesh gauze dressings in respect of case for care and removal and it was favored by the nursing personal. Our findings also supported the findings of Butler PE et al[8] (1993) for ease of removal of alginate dressings.

Regarding the donor site healing when the dressings were removed on 10th post operative day 36 cases (72%) were completed healing, one case (2%) was epithelial islands only whereas in three cases (6%) the dressing were completely adherent to the wound bed and healing could not be assessed. This adherent dressing was left for another one week for complete epithelialization. Thus we were found that complete epithelialization was occurred in 72% of cases on 10th post operative day.

With respect to calcium alginate dressing, conventional dressings takes more than fourteen days for epithelialization, and in most cases it was incomplete. Thatswhy alginate dressing was more beneficial than conventional dressings.

O' Donoghe JM (2000)[10] reported that 91 % cases were achieved complete reepithelialization by 7th post operative day.

Hence our study was shown that calcium alginate dressings were better for ease of application, dressing soakage, pain at donor site, ease of dressing removal in split thickness skin graft than conventional dressings.

Future Research:

Science is dynamic and there is always a scope of improvement and change in time to come ahead. With the progressive aim to move ahead we aspire to achieve highly accurate and reliable results. Thus, every study leaves back scopes for other researcher to do something more advanced and varied in order to touch the height of perfection.

This study examined only 50 subjects in total and data collection was confined to calcium alginate dressings on split thickness skin graft. Thus future researchers can expand the study by including more number of subjects and use of other dressing materials so as to make generalization of results and practice such experiments in variable Hospital setups . Thus it could be applied to real life situation.

Relevance to clinical practice:

The results obtained in this study suggest that calcium alginate dressing is more beneficial than other conventional dressing. So, these results have shown that calcium alginate dressing should be used for dressings over split thickness skin graft on donor sites of patients.

Conclusion:

Findings of present study concluded that calcium alginate dressings over donor sites were quite easy, almost painless, removal was easy and minimal pain, minimal trauma to the newly epithelialized surface and rate of epithelialization was very high on 10th post operative days.

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