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A Comparative Study between Hydrocolloid Dressings and Paraffin Gauze dressing over the Split Thickness Skin Graft Donor Site Area.

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I. INTRODUCTION

A skin graft is sheet of skin harvested from a donor site; it may include the epidermis and part of the dermis (split thickness skin graft) or both the epidermis and dermis (full thickness graft) to cover skin lost due to surgery or trauma. Dressings are used to cover the donor site or the grafted skin; this is done to enhance healing, improve patients' comfort and reduce the pain. Skin dressings can be broadly classified into medicated and non-medicated dressings.Medicated dressings include hydrocolloid dressings, hydrogel dressings. alginate dressings, fibrous absorbent dressings, dressings that contribute to odour management, antimicrobial dressings, and Manuka Honey dressings. The non-medicated dressings include vapour permeable dressings, foam dressings, low adherent dressings, non-adherent wound contact layers, atraumatic absorbent dressings, post-operative dressings, and hydrocapillary dressings. The ideal donor site dressing should be one that promotes rapid re-epithelialization, causes little pain, requires little care, is inexpensive, and has a low rate of infection. The donor sites heal by a process of reepithelialization. Epithelial cells migrate across the wound surface from the rim of the wound and the edges of various structures in the dermal layer such as sebaceous glands and hair follicles. This process results in an epithelial cover of STSG donor site usually within 7-14 days. The aim of the donor site management is to maintain an environment that promotes optimal healing and prevents morbidity that may include pain, infection and ultimately delayed healing.

With all these dressings healing of the donor site area, takes quite a long time and many a times is unpredictable. Removal of the dressing is another area where one faces difficulty as the dressings are almost always adherent to the wound bed and removal is quite uneasy and painful to the patient . This study was undertaken for clinical evaluation of effectiveness of hydrocolloid dressing and traditionally used non medicated (Paraffin gauze) dressing over the split thickness skin graft donor site area.

Material and method

Aim:

Hypotheses:

Two research hypotheses were formulated:

H1.Bates wound assessment scores of hydrocolloid dressing sites were lower than paraffin gauze dressing sites at split thickness skin grafting donor site

H2. Pain scores of hydrocolloid dressing sites was lower than paraffin gauze dressing sites at split thickness skin grafting donor site

Design:

Quasi-experimental design was utilized to accomplish this study.

Sample:

35 eligible patients undergoing split thickness skin grafting were included for the study. All Suitable enrolees were adult male and female, their age ranged between 20 to 40 years, requiring split thickness skin grafting for various etiologies for the first time, the donor area being restricted to anterior thigh measuring between 20 X20 cm to 25 X25 cm, Hb level not less than 10 mg, total body surface area (TBSA)ranged between (40-50%). All participants were taken the same course of antibiotics for five days before operation day and five days after operation, patients who had ability to communicate. The exclusion criteria wereincluding smoker patients, patients who had co- morbidities diseases such as diabetes, renal diseases, cardio-vascular diseases…etc that interfere with wound healing.

Tools for Data Collection:

Background data sheet: include age, gender, and level of education Medical data sheet: diagnosis, day of complete re- epithelialization for hydrocolloid and paraffin gauze dressing.

Pain Scale: Numerical Rating Scale (NRS):

Patients are asked to circle the number between 0 and 10, which fits best to their pain intensity. Zero represents „no pain at all‟ whereas the upper limit represents „the worst pain ever possible‟. Mild pain (1-3), moderate pain (4-6), and severe pain (7-10)(Haefeli and Elfering)[23].

Bates Wound Assessment Tool (BWAT):

This tool used to measure wound and used it at regular intervals to evaluate the effectiveness of therapy. The BWAT consists of 15 items. Each item scored from 1 to 5 to provide an assessment. A score of 1 indicates the healthiest and 5 indicates the unhealthiest attribute for each characteristic The total BWAT scores are categorized into four severity categories ;13–20 = minimal severity; 21–30 = mild severity;31–40 = moderate severity;41–65 = extreme severity.. The internal consistency for the overall BWAT score was 0.815. Cronbach's alpha ranges from 0 to 1 and a score of ≥ 0.7 is accepted value (Jensen, 2001)[24]

Procedure for data collection:

•Interview the patient to explain the purpose, nature, of the study and to obtain an informed consent. Also, interview the surgeons, nurses, and all healthcare providers to explain the purpose and nature of this study, and to obtain their acceptance and cooperation.

•The patients were met over four to five consecutive times to accomplish the following: First time during admission days to fill out the demographic and medical data sheet. Then the researcher met the study participants about three to four times to evaluate the wound healing process utilizing WABT and NRS tools to assess pain intensity. Second time in (4th) postoperative day, third time in (7th)postoperative day, fourth time in(10th)day postoperative day, the fifth time in (14th) postoperative day.

•Observational check list to examine wound healing and the effectiveness of dressing material

Intervention:

In the operative day the researcher preparing the patient‟s sterile field and needed equipment for dressing the donor sites .It was saline, duoderm patch 10cm x10cm and paraffin gauze dressing 10cm x10cm ,bandage ,adhesive tape , identification card included date of operation, and digital camera. After that, the researcher performed complete surgical scrubbing .The surgeon harvesting the skin and taking the partial thickness skin graft from patient‟s thigh.while the surgeon applied the graft over the receipt site .The researcher apply a slight pressure over the donor site with large pieces of gauze soaked with saline for hemostasis for 15 to 20 min.

The donor area was then divided into two equal halves, the proximal half being marked “A” and the distal being “B”. On space “A”, ten x ten cm duoderm dressing was placed on space “B”, a ten x ten cm paraffin gauze was placed. A dry dressing pad and bandage were applied over the first dressing (Shaileshkumar et al., 2012)(22)

On the fourth post operative day the outer dressing was inspected and removed over both the paraffin gauze and duoderm patch. Then Duoderm patch was replaced by new patch. But, leaving the paraffin gauze primary dressing in its place. If any signs and symptoms of infection occur, those patients were excluded from the study and were treated according to hospital routine wound care.

On the 7th ,10th ,14th post operative days both areas (A&B) were assessed for of complete epithelialization and healing process. Only outer dressing was removed for both areas(A&B). But the inner dressing was remained in it‟s place if complete wound epithelialization did not occur.

Also photographs of donor site was done five times in the operating room, 4th day 7th day and 10th day and 14th day for recoding the wound healing progress at two areas (A&B)of donor site.

Pilot study:

A pilot study was conducted on five patients, who were then excluded from the main study sample. The pilot study aimed to: (i) estimate the required sample size (ii) calculate the time necessary to interview the patients, (iii) test the clarity and understandability of the questionnaires and (iv) examine the feasibility of the dressing technique. All questionnaires items were clear, understandable and some modification was required. The results of the pilot study confirmed that the study was feasible.

Ethical considerations:

An official permission to conduct the study was obtained from the head of the hospital directors. Informed consent for patient‟s agreement was obtained after explanation of the nature and purpose of the study. Each patient was free to either participate or not in the study and had the right to withdraw from the study at any time without any rationale and it don‟thave an effect on upon care provided. Also, patients were informed that obtained information does not be included in any further researches. Confidentiality and anonymity of each subject were assured through coding of all information.

Statistical data analysis:

Statistical analysis was performed using SPSS for Windows, version 19. Descriptive statistics and frequencies were computed to explain sample characteristics, pain intensity for the dressing materials. Two ways ANOVA was used to compare mean differences in continuous variables

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of BWAT total score for hydrocolloid and paraffin gauze dressing

II. RESULT

Table(1) Sample characteristics

Items	**Frequency**	**%**
Age		
18-30	28	80
31-40	7	20
Mean±SD	26.42±6.255	
Gender		
Male	29	82.9
Female	6	17.1
Level of education		
Canread and write	9	25.7
Technical education	14	40.0
Secondary education	12	34.3

Table (1) show that, the majority (82, 9%) of the studied group were male.Their age ranged between (18-30) years old, andwere educated(74.3%).But only (25.7%) can read and write .

Table(2)Medical Data:

Items	**Frequency**		**%**	
Diagnosis				
Burn	20		57.1	
External fixation	15		42.9	
	Minimum	Maximum	Mean	Std. Deviation
Day of complete epithelialization for duoderm dressing	7.00	10.00	8.6286	1.08697
Day of complete epithelialization For Paraffin gauze dressing	13.00	21.00	15.2286	3.02038

Table(2) indicated that, 57.1% of the studied sample admitted with burn ,while 42,9% had external fixation transferred from orthopedic sections .All subjects were admitted for the purpose of skin auto-grafts. Subjects" utilized duoderm dressing reported rapid skin epithelialization and faster wound healing than Paraffin gauze dressing with mean and standard deviation equal to (8.6286±1.08697, 15.2286± 3.02038)respectively.

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Table(3) (BWAT) Repeated measure ANOVA for hydrocolloid and paraffin gauze dressing during the 4^{th},7^{th},and14^{th} day

Items	Hydrocolloid			paraffin gauze		
	4^{th}day	7^{th}day	10^{th}day	4^{th}day	7^{th}day	10^{th}day
	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD
Size	2.9±.24	2.09±.28	1.00±.00	2.48±.56	2.08±.37	2.02±.16
Depth	2.0±.00	1.20±.41	1.00±.00	1.91±28	1.94±.23	1.62±.49
Edges	1.8±.41	1.28±.45	1.00±.00	1.91±.28	2.00±00	1.91±.28
Undermining	1.0±.00	1.0±.00	1.00±.00	1.00±.00	1.02±.16	1.00±.00
Necrotict issue type	1.0±.0	1.0±.00	1.00±.00	1.00±.00	1.05±.23	1.00±.00
Necrotict issue Amount	1.0±.00	1.00±.00	1.08±.28	1.00±.00	1.00±.00	1.00±.00
Exudates type	2.4±.51	1.31±.63	1.28±.45	3.42±.69	2.94±.76	1.85±.73
Exudates amount	2.2±.43	1.31±.63	1.17±.38	4.05±.87	3.71±.95	2.28±.51
Skin color	1.0±.17	1.08±.28	1.03±.16	1.00±.00	1.00±.00	1.00±00
Peripheral tissue edema	1.0±.00	1.00±.00	1.00±.00	1.00±.00	1.00±.00	1.00±.00
Peripheral tissue indurations	1.0±.00	1.08±.28	1.00±.00	1.11±.32	1.00±.00	1.00±.00
Granulation tissue	1.0±.00	1.00±.00	1.00±.00	1.00±.00	1.00±.00	1.00±.00
Epithelialization	4.86±.35	1.82±.56	1.20±.40	4.88±.32	3.37±.80	2.14±.73
Total score	23.34±.998	16.20±2.03	13.77±1.13	25.80±1.53	23.14±2.15	18.85±1.61
F ratio/ P value	17783.959/.000***					

It is observed that there was a gradual decrement in the Bates Wound Assessment Tool (BWAT) total mean score changing the dressing at duoderm and paraffin sites on the 4^{th} ,7^{th} ,and 10^{th} day, But, decrement at the duoderm sites was greater and faster than paraffin dressing sites with a mean and standard deviation equal to(23.34±.998, 16.20±2.03,13.77±1.13versus25.80±1.53,23.14±2.15,and18.85±1.61)respectively.Accordingto Bates wound assessment tool (BWAT) the lesser wound assessment score the heather skin tissues and better wound healing at the duoderm sites. Also, there were a statistical significance difference between the three durations of changing the dressing at the paraffin and duoderm sites for the same subjects with F/P value equal to(17783.959/.000*).See figure(2).below

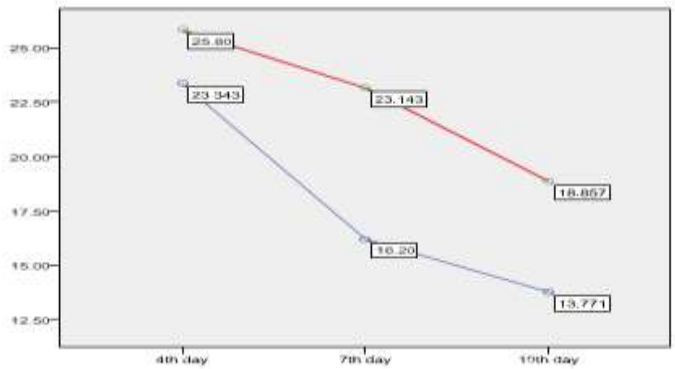

Figure.(2)Comparison of Bates Wound Assessment Score for Duoderm Dressing versus Paraffin Gauze Dressing

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Table(4) frequency and percentage distribution for pain intensity among the studied subjects N=35

items	Hydrocolloid dressing		Paraffin gauze		Chi Square\	P Value
	Frequency	%	Frequency	%		
Pain in the4th day					1.248	.536
None	16	45.7	---	---		
Mild	19	54.3	---	----		
Moderate	---	---	3	8.57		
Severe	---	----	32	91.42		
Pain in the7th day					22.63	.000*
None	30	85.7	---	---		
Mild	5	14.3	---	----		
Moderate	----	----	19	54.29		
Severe	----	----	16	45.71		
Pain in the10th day					21.32	.013*
None	32	91.4	----	----		
Mild	3	8.6	----	----		
Moderate	----	----	20	57.14		
Severe	----	----	15	42.86		
Pain in the14th day					5.651	.059*
None	35	100	----	----		
Mild	----	----	10	28.58		
Moderate	----	----	20	57.14		
Severe	----	----	5	14.28		

In table (4) it was interesting that subject reported that54.3%hadmildpain, and 45.7% had no pain at the duoderm sites, while the majority (91.42%) reported severe pain at the paraffin gauze dressing sites during the fourth day changing the dressing for the same subjects. During the seven thandtenth and fourteenth day of changing the. dressing subjects exhibited lesser pain intensity at douderm sites in comparison with paraffin gauze sites in percentages of(85.7%,no,14.3%mild-91.4%,no,8.6%mild,100%noversus54.29% moderate, 45.71% severe--57.14%, moderate ,42.86% severe -57.14% moderate, 14.28% severe, 28.58,mild) respectively.

III. DISCUSSION

In the past surgeons has been used theparaffin gauze dressingas the primary choice for bandaging of split skin donor site due to its simple application patient comfort and low risk of infection with incurring minimum cost. with time several materials came in to force like silver coated dressing(11)collagen film dressing(12)hydrofiber dressing(13)alginate dressing(14)polyurethane foam dressing(15)one of these materials hydrocolloid dressing has be taken in our study. The hydrocolloid dressings are a new variety which claim to be superior to the older dressings in various parameters. The hydrocolloid material has following benefits

Hydrocolloid was found to form a fibrin layer between the dressing and the wound, creating a physical barrier that retains cytokines, particularly intrinsic growth factors(16,17,18)

It gives moist envoirment which is favorable for epithelial cell proliferation (21)

The Hydrocolloid dressing forms a highly absorbent gel that facilitates its removal, thereby reducing trauma during dressing changes

Hydrocolloid causes less discomfort and pain and less scarring donor site dressing (20)

it is noticed in our study that suitability of either material for a particular sex has no significant difference with regard to wound healing time, however both dressings show a slight trend in favour of male healing pattern. in this study hydrocolloid shows better wound healing when compairedto paraffin gauze in central india, this study conducted in central india at madhyapradesh. it is a cost sensitive area it was noticed that despite the advantage of hydrocolloid dressing the use of paraffin gauze was more practiced.a review carried out with surgeons shows 75%-78% showing preference to paraffin gauze for it overall economy.the cost assessment hydrocolloid dressing is 4.5% costlier than paraffin gauze dressing.

IV. CONCLUSION

Women had significantly larger wounds (i.e. slower healing) than men in the younger group(8)The study conclude that Hydrocolloid dressing is superior to paraffin gauze dressing. Because of its shorter healing time,faster re – epithelialization, fewer dressing changes and reduced pain when compared with paraffin gauze dressing.

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