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Original Research Paper

General Surgery

CONVENTIONAL SCOOPING VS SERIAL TANGENTIAL EXCISION OF ULCER AND SPLIT SKIN GRAFTING

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ABSTRACT Chronic wounds are a result of traumatic injuries like burns or even constitute poor wound healing due to underlying conditions like diabetes, venous insufficiency, poor nutritional status, etc. Medical conditions like Diabetes Mellitus, arterial insufficiency, venous disease, lymph oedema, steroid use, connective tissue disease and radiation injury those inhibit wound healing. In general, they have a fibrotic margin and a bed of granulation tissue which may include areas of slough.2 In most of the patients with chronic granulating wounds split skin grafting is the preferred option for coverage of the wounds.3 Some surgeons favoured application of skin graft on the granulation tissue after scraping with scoop.3,4 This is a prospective comparative study was conducted at General Surgery department of SMIMER hospital, Surat. The study was conducted for a period of 18 months. The study population included, the patients with chronic wound attending the out-patient department at SMIMER hospital, Surat. A total of 52 patients were included as inclusion and exclusion criteria. They were divided into two groups. In the first group the procedure of skin grafting is done on the healthy chronic wound after scraping with scoop. In second group method recipient raw area were prepared using Humby's knife. Granulation tissue of recipient raw area excised by serial tangential excision method. After that split-thickness graft placed over recipient raw area. Two groups are compared in terms of outcome, graft uptake, hospital stay, infection, numbers of dressing required in post-op period and graft rejection.

KEYWORDS : scooping, tangential excision, ulcer, granulation tissue, split-thickness skin grafting, raw area

INTRODUCTION

Chronic wounds are moreover painful, debilitating and majorly impairing the quality of life of the affected individuals. Chronic wounds are a result of traumatic injuries like burns or even constitute poor wound healing due to underlying conditions like diabetes, venous insufficiency, poor nutritional status, etc.

There are numbers of patients with chronic wound coming to our hospitals, most of them belongs to lower socioeconomic class. Often, they present late with grossly infected wound and a considerable amount of time has to be spent in preparing these patients in respect of improving the general health and wound management. Medical conditions like Diabetes Mellitus, arterial insufficiency, venous disease, lymph oedema, steroid use, connective tissue disease and radiation injury those inhibit wound healing. In general, they have a fibrotic margin and a bed of granulation tissue which may include areas of slough.[2] Patients with chronic wounds suffer from significant amount of pain with multiple tedious procedures and hospital stays. The main aim of managing the chronic wounds by split-thickness skin grafting is to find the best possible way to reduce post-op care and morbidity, which grossly include the hospital stay with improved percentage of graft uptake and decreased number of post-op dressings required. In most of the patients with chronic granulating wounds split skin grafting is the preferred option for coverage of the wounds.[3] Some surgeons favoured application of skin graft on the granulation tissue after scraping with scoop.[3,4] This technique is conventionally used by them. We use a newer technique that is usually used in burn-patients. In this technique first necrotic and Escher of burnt skin is tangentially excised using a knife until fresh punctuate bleeding. Then the area is a covered with split thickness graft. The granulation tissue is excised in layers by serial tangential excision using a knife. The superficial layer is believed to contain the superficial colonizing bacteria. Deep layer is believed almost identical with bed area from where the skin graft has been taken (donor site). And today, the better take up survival and wide spread use with positive amount of success makes split thickness skin graft boon towards management of chronic wounds especially in a country like India where it allows patient from all social background to gain its accessibility. The split thickness skin grafting is most commonly performed for chronic non healing wound to close the wound defect. And with this, the purpose of skin grafting has changed from improving rate of survival to improving the quality of life. So, it is important to make skin grafting technique better. In our study, we are going to compare the conventional scooping and scraping of the granulation tissue before skin grafting vs tangential serial excision of granulation tissue using a humby's knife.

Methodology

This is a prospective comparative study was conducted at General Surgery department of Tertiary SMIMER hospital, Surat. The study was conducted for a period of 18 months. The study population included, the patients with chronic wound attending the out-patient department at SMIMER hospital, Surat. A total of 52 patients were included in our study. Patient with aged between 6 to 80 years with chronic wound at any site following trauma, infection and burns were included in this study. Patients with chronic wound due peripheral vascular disease, coagulation disorders, ulcer due filariasis and radiation were excluded. The patient that fulfilled the inclusion and exclusion criteria are selected allocated into groups. In the first group the procedure of skin grafting is done on the healthy chronic wound after scraping with scoop. Co morbid condition like Necrotizing fasciitis, DM, Hypertension were noted in both groups. In second group method recipient raw area were prepared using Humby's knife. Granulation tissue of recipient raw area excised by serial tangential excision method in which thickness of the tangential excision was arbitrary (it is done until the whitish base appeared at recipient raw area). It was measured by graph paper method by subtracting the area of graft loss from estimated pre-operative area wound area on both groups. Further dressing was done if needed.

After preparation of wound bed and applying liquid paraffin to donor area, using humby's knife or dermatome and ensuring the thickness for graft and appropriate size blade,

skin graft harvesting done. After that harvested skin graft expansion done using Mesher. After that harvested skin graft placed at recipient site and fixed with skin staplers. Povidone-iodine ointment and liquid paraffin gauze dressing kept at both recipient site and donor site.

Group A (26 Patients): In this group of patient preparation of wound bed for STSG was done with conventional scooping method.

RESULTS

Total 52 patients were included in our study based on inclusion and exclusion criteria. They were divided equally into two groups; group A and group B. Majority patients were between 20-40 years of age.

Age Distribution		
Age (years)	Group A	Group B
06-20	09 (34.61%)	10 (38.46%)
20-40	11 (42.30%)	11 (42.30%)
40-60	05 (19.23%)	05 (19.23%)
60-80	01 (03.84%)	00
Total	26	26

In our study majority patients were male. Total 15 out of 26 patients were male in group A and 18 out of 26 were male in group B. Whereas total 11 out 26 patients were female in group A and 08 out of 26 patients were female.

Sex Distribution		
Gender	Group A	Group B
Male	15	18
Female	11	08
Total	26	26

Associated conditions		
Conditions	Group A	Group B
Hypertension	02 (07.69%)	03 (11.53%)
Necrotizing Fasciitis	18 (69.23%)	15 (57.69%)
Diabetes mellitus	06 (23.07%)	08 (30.76%)

In our study, majority of patients having necrotizing fasciitis as associated condition. In group A, 02 patients were having hypertension, 18 were having necrotizing fasciitis and 06 patients were having diabetes mellitus.

Hospital Stay (Days)		
Hospital Stay	Group A	Group B
08-10	01	18
11-13	05	07
14-17	11	01
18-20	06	00
>20	03	00
Total	26	26

In our study, we observed that there was significant difference in hospital stay between group A and group B patients. In group B, majority of patients had to stay in hospital for 8-10 days. Whereas in group A, it was between 14-17 days.

Post op dressing		
Post op dressing (numbers)	Group A	Group B
0-1	00	18
2-3	19	07
4-5	06	01
>6	01	00
Total	26	26

There were less numbers of dressing required in group B patients in comparison to group A patients. Group A patients required more numbers of dressing due to frequent soakage. Thus, required longer hospital stay for group A patients compared to group B patients.

Percentage of graft uptake		
Skin graft uptake %	Group A	Group B
95-100%	10	22
90-95%	09	02
80-90%	07	02
<80%	00	00
Total	26	26

In our study, we observed that among total 26 patients in group B, 95-100% graft uptake in 18 patients, 90-95% graft uptake in 06 patients, 80-90% graft uptake in 02 patients.

In group A patients, 10 patients had graft uptake of 95-100%, 09 patients had graft uptake of 90-95%, 04 patients had graft uptake of 80-90% and 03 patients had graft uptake less than 80%.

DISCUSSION

This prospective, comparative study was aimed at assessing the surgical outcomes following serial tangential excision and conventional scooping in split thickness skin grafting. The patients admitted with chronic wound following burn, infection or trauma etc., were randomized for conventional technique (GROUP A) or serial tangential excision (GROUP B) on the odd-even basis. In the conventional scooping method (GROUP A) recipient raw area was scrapped using surgical scoop to remove excessive granulation tissue for graft placement. In the serial tangential excision method (GROUP B) granulation tissue at graft recipient area is excised using Humby's knife before graft placement. With regards to Post op hospital stay, around 76% patients operated with conventional scooping (GROUP A) required >13 days of hospital stay as compared to the serial tangential excision method (GROUP B) whereas 96% patients required ≤13-day of hospital stay.

In Kanpur study, around 85% patients operated with conventional scooping required >13 days of hospital stay as compared to the tangential excision method where most of the patients (98%) required ≤13-day of hospital stay. The mean duration of post-op hospital stays reported in Kanpur study were 18.43 ± 4.21 days and 9.22 ± 1.33 days for conventional scooping and tangential excision method, respectively. While the mean duration of hospital stay was nearly similar for tangential excision in both the studies, the mean duration for conventional scooping group was lesser in our study. With regards to the primary outcome measure of graft uptake on 5th POD, around 85% patients with serial tangential excision method (GROUP B) showed 96% to 100% skin graft uptake as compared to only 38% patients with conventional scooping (GROUP A). Percentage of graft uptake by skin grafting techniques also found statistically significant difference between the two techniques ($p<0.001$). No patient showed <80% of take-rate. The results for serial tangential excision in our study are comparable to those with a Kanpur study where about 87% patients had skin graft uptake-rate of 96% to 100%. However, for conventional scooping group, Kanpur study had lower skin graft take-rate as compared to our study, as only 18% patients had a take-rate of 96% to 100%. In addition, few studies have also reported that serial tangential excision and grafting fairs better compared to even delayed excision and grafting. An army hospital from North India reported that skin graft take-rate and duration of hospital stay (lower) were much superior in the early excision group compared to delayed excision group. The study further reported that functional outcomes were better achieved with less need of secondary surgical procedures.

A study from Indonesia primarily studied the effect of early tangential excision v/s delayed excision on length of hospital stay for 42 patients with varied burn degrees. The study found that the duration of hospital stay was much shorter in early excision group (9.81±6.41 days), as compared to the delayed excision group (15.80±5.67 days). The findings for early excision hospital stay duration are also comparable with mean duration in our study reported for the tangential excision group.

Overall, our study found that the tangential excision method fairs better compared to the conventional scooping method on a number of outcome indicators, including skin graft take rate, number of post- operative dressing required and mean duration of hospital stay.

CONCLUSION

We all know that granulation tissue of wound is colonized with micro-organism, so when we try to remove that excessive granulation tissue using Humby's knife in serial tangential excision manner it actually converts chronic wound to acute secondary wound and it creates an identical smooth surface bed for graft harvesting. Thus, chances of graft uptake in split-thickness skin grafting increases and thus the patient require less no of post operative dressing and less no of hospital stay.

So, we can conclude after doing this study is that Serial tangential excision of raw area before Split- thickness skin grafting is better method than routinely done Conventional scooping before split- thickness skin grafting.

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