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Study to Evaluate Efficacy of Tie Over Dressing Over Conventional Dressing

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Abstract:
Background and Objectives: *Skin grafting is an important method of resurfacing for raw areas. Tie over dressing with bolster and conventional gauze dressing have been used for the purpose of securing the graft. This study is performed to compare their efficacy and complications.*
Material and Methods: *A longitudinal study of 18 patients requiring skin grafting with tie over dressing and conventional dressing were selected for the study. A follow up was done to study and compare the complications in the subjects.*
Results: *The frequency of complications in tie over dressing was 11.1% in seroma, hematoma, wound infection, miscellaneous and mixed complications which was lower than the conventional dressing which had 22.2% in hematoma and graft loss (more than 5%) and 11.1% in seroma, wound infection, soakage, miscellaneous and mixed complications.*
Conclusion: *It was found that a tie over dressing is an important adjunct in certain specific anatomical locations of recipient graft site.*
Keywords: *Tie over Dressing, Bolster dressing, Conventional dressing, Skin graft*

INTRODUCTION:

There are several methods to achieve wound coverage – secondary healing, primary suturing, skin grafting, and flap surgeries as described in reconstruction ladder (1). Using a skin graft to cover the wound of patients is an integral part of surgery. Soft tissue coverage for wounds remains a difficult management problem for patients sustaining traumatic injury and burns. Placement of the graft dressing in such a manner that it reinforces the graft placed and at the same time is fixed to the recipient site requires different methods of dressing (2). In our study we present the method of tie over bolster dressing with silk threads fastened with staples for the placement of graft over recipient area and compare it to the conventional dressings of placement of gauze pieces and securing them by an external sticking adhesive such as micropore after padding.

AIM AND OBJECTIVES:

- To clinically evaluate the efficacy of tie over dressings and to compare it with the conventional dressings.
- To study the clinical feasibility of tie over dressings according to the anatomical location of the wound.
- To study the complications in tie over versus conventional dressings.

MATERIAL AND METHODS:

A longitudinal study was done at Rajareswari Medical College and Hospital, a multi speciality and super-speciality medical college and hospital at Bangalore, India, over a study period from November 2016 to December 2017.

INCLUSION CRITERIA:

All patients requiring skin grafting for coverage of raw area admitted inward in Department of Plastic Surgery during the study period.

Patients who gave consent for the study were included.

EXCLUSION CRITERIA:

All patients with co-morbidities rendering them unfit for surgery.

Patients with previously infected wounds.

PROCEDURE:

18 patients were included in the study. The patients were admitted in the ward and fitness was obtained for surgery. Basic laboratory investigations were performed including Hemogram, Liver function tests, Renal Function tests, blood sugar levels, serology, Serum electrolyte levels and wound culture. An informed consent was taken. The area to be grafted was debrided and cleaned. For post burn contractures, the contractures were released. Then hemostasis was achieved and the wound bed was prepared for grafting. After placing the graft on the wound bed, paraffin gauze dressing was applied over it. Then a layer of moist gauze was applied to the dressing. A layer of wet cotton was applied to the moist gauze to fill the depth of the grafted area so that no dead spaces were left. Then sterile silk threads were placed on the skin margins near the recipient site. Then skin staples were applied to the free silk thread ties. The threads were tied to secure them to the staple first. The site was fixed with such staples and threads tied to the staples with at least one long end. Now using oppositely placed threads fixed to the staples, such paired threads are tied to the bolster to ensure the dressing was secured. The grafted site was then immobilized with braces, casts or Kirschner's wires as applicable. A check dressing was performed after 5 days. Then regular dressings were performed. Post operatively an antibiotic cover of Cephalosporin was given to all. Cultures were taken in the cases of discharge from the wound. Dressings were changed if there was soakage of the overlying pad. Seroma and hematoma were drained when required. A follow up of 3 months was done and the results noted.

RESULT:

A total of 18 patients were included in the study, 10 males and 8 females.

Table 1: Distribution of male and female patients.

Type of Dressing	Male	Female
Tie over dressing	5	4
Conventional dressing	5	4

Table 2: Age distribution of the patients.

Type of Dressing	Mean Age (y)
Tie over	34.2
Conventional dressing	37.1

Table 3: Regional Anatomical distribution on both types of dressings.

Anatomical Distribution	Tie Over	Conventional
Head and Neck	3	2
Upper Limb	4	2
Thorax & Abdomen	1	1
Pelvis & Perineum	1	1
Lower limb	1	2
Total	10	8

Table 4: Distribution of Complications in both types of dressings.

Complications	Tie Over	Conventional
Seroma	1	1
Hematoma	1	2
Graft loss (>5%)	0	2
Soakage	0	1
Infection	1	1
Miscellaneous	1 (pain and discomfort)	1
Mixed Complications	1	1
Total	5	9

Table 5: Distribution of complications with the different regional anatomical location of the recipient graft site in Tie over dressing

Anatomical Distribution	Seroma	Hematoma	Graft loss	Soakage	Infection	Miscellaneous	Mixed Complications	Total
Head and Neck	0	1	0	0	0	1(pain and discomfort)	0	2
Upper Limb	0	0	0	0	1	0	0	1
Thorax & Abdomen	0	0	0	0	0	0	0	0
Pelvis & Perineum	1	0	0	0	0	0	0	1
Lower limb	0	0	0	0	0	0	1(pain and soakage)	1
Total	1	1	0	0	1	1	1	5

Table 6: Distribution of complications with the different regional anatomical location of the recipient graft site in Conventional Dressing

Anatomical Distribution	Seroma	Hematoma	Graft loss	Soakage	Infection	Miscellaneous	Mixed Complications	Total
Head and Neck	1	1	0	0	0	0	0	2
Upper Limb	0	1	0	0	0	1	0	2
Thorax & Abdomen	0	0	0	1	0	0	0	1
Pelvis & Perineum	0	0	1	0	1	0	1	3
Lower limb	0	0	1	0	0	0	0	1
Total	1	2	2	1	1	1	1	9

The frequency of complications in tie over dressing was 11.1% in seroma, hematoma, wound infection, miscellaneous and mixed complications. (i.e. seen in 1 out of 9 patients). There was no graft loss of more than 5% surface area of the graft and no pad soakage that required the change of the dressing.

The frequency of complications in conventional gauze dressings with an external adhesive was 22.2% in hematoma and graft loss of more than 5% surface area of the graft. 11.1% in seroma, wound infection, soakage, miscellaneous (pain and discomfort) and mixed complications (infection and graft loss).

DISCUSSION:

Skin graft once applied to the wound must be covered with paraffin gauze to avoid separation from the wound bed at time of change of dressing. For graft fixation the ideal dressing method should be rapid, simple, repeatable, able to be done in OPD setting, prevent hematoma or seroma formation, soak the exudates well and allow the graft bed to be inspected (1).

Multiple methods have been described for securing graft on the wound with the dressings search as hydrocellular dressing, foam dressing, NPWT dressing, simple tie over with bandages and application of external sticking such as micropore (3-5). In some cases, the dressing has to be opened early to be inspected and redressed (6).

In the present study tie over bolster secured with threads and staples, the dressing can be easily applied and the threads can be tied over. During the changing of the dressing the threads can be cut and another set tied or retied, as it suits the surgeon. The dressing can be changed in the OPD setting with minimal efforts. Since a firm compression is maintained over the dressing, absorption of exudates adequately achieved. There was minimal seroma or hematoma formation. The grafted site is securely fastened. Similar studies have been performed by Hardeep Singh et all using the strain sample container for tie over and fixing with stapler (7).

A running tie over dressing with barbed wires is reported by Pelissier P, Martin D and Baudet J. (8). They reported that the running tie over has been reported to be faster than a traditional tie over.

Other study using skin staplers and round rubber bands has been described by Kim Y.O., Lee S.J., Park B.Y. and Lee W.J. (9).

Kaplan had reported a quick stapler tie over fixation for skin grafting in his study (10). Similar studies were performed by Koldas (11); A. Amir, A. Sagi, D.M. Fliss, L. Rosenberg(12); L. Eroglu, M. Keskin, E. Guneren, O.A. Uysal (13); L. Valdatta, A. Thione, M. Buoro, S. Tuinder, C. Mortarino, C. Fidanza, *et al* (14) and D.A. Burd (15).

In our study the mean age group of tie over dressing was 34.2 yrs and conventional dressing was 37.1 yrs. Age of study subjects ranged from 18 years to 67 years.

As per the anatomical distribution comparable number of cases was used in the tie over and conventional dressing.

The complications were noted for each type and frequencies compared. Most common complication in tie over dressing was pain and discomfort compared to conventional dressing which had seroma as the most common complication followed by hematoma and graft loss.

On comparing the complications to the different anatomical locations it was seen that the frequency of complications such as seroma, hematoma, graft loss was reduced in tie over dressings in certain specific anatomical distributions such as Head and neck, Upper limb (Axilla) and pelvic and/or perineal cases.

CONCLUSION:

Tie over bolster dressing with staples is an effective adjunct in certain specific anatomical distribution with undulating surfaces and helps in the placement of the graft securely. The complications are much lesser in such dressings making it a viable option for such instances.

Fig 1. Placement of skin staples with silk threads tied over.

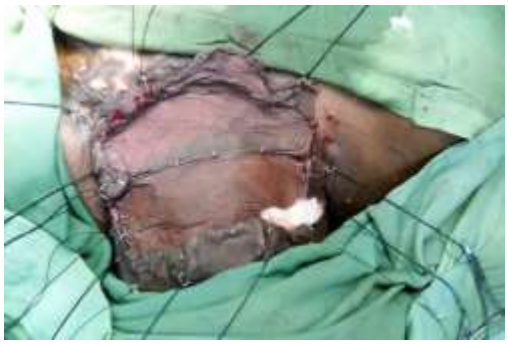

Fig 2. Close up view of threads placed with tie over silk threads with fluffs of cotton to obliterate dead space.

Fig 3. Stapled threads tied over the padded dressing securing it.

Fig 4. Post-operative view showing the graft take.

Fig 5. Post-operative view same patient as Fig 4 from lateral end.

Figure 6. Pre-operative post Burns Neck Contracture.

Fig 7. Postoperative view after tie over dressing with graft take same patient as in fig 6.

Fig 8. A case of necrotizing fasciitis, grafted after wound was prepared showing graft loss in the thigh and adjoining groin dressed with conventional dressing.

Fig 9. Post-operative view of graft take with tie over dressing in the scalp.

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