

## "TENT IN" TECHNIQUE OF TIE-OVER DRESSING

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### ABSTRACT

#### BACKGROUND

Skin grafting is the most common method used for wound coverage in Plastic Surgery. Firm contact of the skin graft with the graft bed is essential for good take. Tie-over dressing is essential for this. Numerous methods have been described for this purpose.

#### AIM

To introduce a new method of tie-over dressing - "Tent in" technique.

#### MATERIALS AND METHODS

In this method, sterile synthetic hand towel is used for graft fixation along with sponge and staples. The sterile synthetic hand towel is available along with the disposable theatre gown. It is a type of synthetic nonwoven cloth, which is stretchable only in one direction. This method was tried in 30 patients with various indications and over different sites.

#### RESULTS

The patient group consisted of 18 males and 12 females. The age ranged from 16 yrs. to 71 yrs. (mean 51.2 yrs.). Among 30 cases included in this study, the graft take was excellent in all except two. In all cases in which this procedure was used, there were no seroma or haematoma under the skin grafts.

#### CONCLUSIONS

'Tent in' technique is a novel method for placing tie-over dressing. This method is simple, fast and easy to practice. Excellent graft take is obtained by this technique.

#### KEYWORDS

'Tent in' Technique, Tie-Over Dressing, Sterile Hand Towel, Split Skin Graft.

#### MeSH TERMS

Skin transplantation, Dressing.

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**INTRODUCTION:** Skin grafting is the most common method used for wound coverage in plastic surgery. Even with newer advances in plastic surgery, the relevance of skin grafting has not decreased. Good graft take is the aim in skin grafting. The most common cause of skin graft failure is haematoma formation under the graft. Firm contact of skin graft with the graft bed is essential for good graft take.<sup>1</sup> Tie-over dressing is essential for good graft take so that graft is not elevated off the bed by the formation of haematoma or seroma. It also prevent shear forces so that fibrin cross linkage is not disrupted. Numerous methods have been described for tie-over dressings. An ideal tie-over dressing should firmly attach graft with bed, uniformly distribute the

pressure all over the bed, easy to apply, easy to learn and absorb any secretion from the graft bed. A novel method of tie-over dressing 'Tent in' technique is described.

**MATERIALS AND METHODS:** In 'Tent in' technique of tie-over dressing, sterile synthetic hand towel is used for graft fixation along with sterile sponge and staples [Figure 1]. The sterile synthetic hand towel is available along with the disposable theatre gown. It is a type of synthetic nonwoven cloth, which is stretchable only in one direction. It is freely available inside the operation theatre. Medium thickness split skin graft is harvested from thigh, meshed and applied to the prepared raw area. Graft is fixed with staples and paraffin gauze is placed over it. Sterilised sponge of four centimetre thickness is shaped according to the defect such that the edges are bevelled outwards. Downs blade taken for harvesting skin graft is used for this purpose. Multiple sponges can be used if the area is large or surface is concave. Sponge is then soaked in saline, squeezed and kept over the defect. Sterile synthetic hand towel is then placed over the sponge, pressed with the left hand and under pressure stapler is used for its fixation to the skin margins. The excess towel is trimmed [Figure 2].

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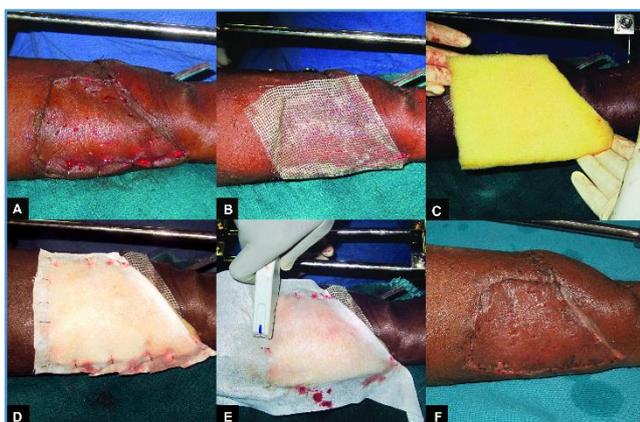
This tie-over dressing can be applied over male external genitalia also. For this purpose, an 'H' shaped slit is made in the sponge. Skin graft is applied over the testis and paraffin gauze is placed over it. The sponge is soaked in saline, squeezed and kept over the testes such that it will fit into the 'H' shaped slit. Sterile synthetic hand towel is then placed over the sponge, pressed and stapled [Figure 3]. This tie-over dressing can be removed just by taking off the staples.

This method was tried in 30 patients between May 2015 and May 2016 at Department of Plastic Surgery, Govt. Medical College, Kozhikode. The indications for skin grafting included posttraumatic raw area, excision of cutaneous lesions, venous ulcer, lymphoedema with ulcer, post burn contracture release and post infection raw areas. The different sites over which it was applied include axilla, neck, leg, external genitalia, sacral area, shoulder, ankle and wrist. Outcome was measured as percentage of graft success at day 5 and was measured in the range of 10%.

**RESULTS:** The patient group consisted of 18 males and 12 females. The age ranged from 16 yrs. to 71 yrs. (mean 51.2 yrs.). Defect size ranged from 2.5 x 3 cm<sup>2</sup> to 18 x 27 cm<sup>2</sup> (mean 6.7 x 11.4 cm<sup>2</sup>). Among 30 cases included in this study, the graft take was excellent (90-100%) in all except two. With this procedure, there was no seroma or haematoma formation under the graft. The mean graft successful rate was 93% (28/30). In two cases, there was infection and partial graft loss of 10% and 20%. They were managed by antibiotics and regular dressings.

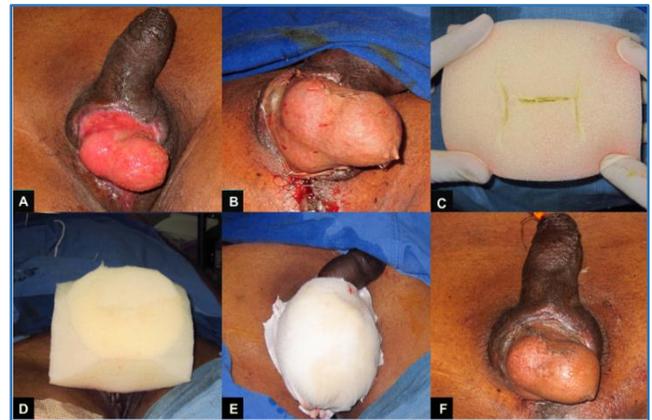


**Fig. 1: Sterile Synthetic Hand Towel**



**Fig. 2: Various Stages in the Application of Tie-Over Dressing by 'Tent In' Technique.**

- A. Fixation of Graft.**
- B. Application of Paraffin Gauze.**
- C. Application of Sponge.**
- D. Application of Sterile Hand Towel.**
- E. After the Application of Tie-Over Dressing by 'Tent In' Technique.**
- F. Graft Take After the Removal of Dressings.**



**Fig. 3: Various Stages in the Application of Tie-Over Dressing by 'Tent In' Technique Over Male External Genitalia.**

- A. Raw Area.**
- B. Fixation of Graft.**
- C. H Shaped Slit on the Sponge.**
- D. Application of Sponge over the Graft.**
- E. After the Application of Tie-Over Dressing by 'Tent In' Technique.**
- F. Graft Take After the Removal of Dressings.**

**DISCUSSION:** Most of the complex reconstructive procedures may require skin grafting as a part of it. This is usually done as the last step and placing tie-over dressing by the conventional means often consume valuable time. Thus, an easy and fast method, which exerts adequate pressure all over the graft is required for tie-over dressing. Blair and Brown in 1929 documented that even pressure must be applied over the graft for successful graft take.<sup>1</sup> A minimum pressure of 25 mmHg should be exerted by a tie-over dressing to prevent formation of seroma or haematoma.<sup>2</sup> Lesser pressure can result in inadequate contact and may cause the formation of liquid collections. Too much pressure can compress the capillaries and lead to necrosis of the graft.<sup>3</sup> Thus, tie-over dressing with adequate pressure is essential for preventing graft failure.

In 'Tent in' technique of tie-over dressing, the sterile synthetic hand towel act as a tent over the sponge placed over the graft so that uniform and adequate pressure is exerted over the graft. If the area to be grafted is a concave surface, sponge of adequate thickness or multiple sponges should be used so that it fills in the cavity and project over the surface. The sponge will also absorb any secretions from the graft bed. The manoeuvre of soaking sponge in saline make the sponge soft, compressible, more pliable and it will expand and apply more pressure when dried. Also, it will provide moisture essential for graft take.

The synthetic towel is stretchable in one direction only. If the raw area is large and rectangular in shape, the synthetic towel should be placed over the sponge in such a way that the nonstretchable axis should be along the breadth of the rectangle so that adequate pressure is exerted. If the raw area is large, two layers of synthetic hand towel provide better fixation. Pressure can be increased by increasing the height of sponge or stretch of the synthetic towel.

The conventional silk bolster technique is a time tested method of tie-over dressing. But, it requires an assistant to tie the knots with adequate tension and a considerable amount of time is required for this procedure. It has been shown that the pressure exerted on the wound bed by this method is neither adequate nor uniform.<sup>4</sup> Negative pressure dressing decreases bacterial load, allows moist wound healing, creates a uniform pressure and applies the skin graft firmly to the wound bed. Negative pressure dressing is associated with improved graft survival when compared with the bolster dressings.<sup>5</sup> But, it is expensive, require special equipment, more time and expertise to apply effectively and difficult to maintain the air seal. Several modifications of these techniques and different types of materials have been utilised for tie-over dressings including barbed sutures,<sup>6</sup> nylon tie-strips,<sup>7</sup> staples and foam,<sup>8</sup> aluminium collars,<sup>9</sup> silicone gel<sup>10</sup> and plastic discs.<sup>11</sup> All these techniques have their own advantages and disadvantages.

There are many advantages for 'Tent in' technique of tie-over dressing when compared to the conventional bolster technique. It is fast and easy when compared to the bolster technique as the fixation is done by using staples and no suturing and knot tying is required. At the end of the long procedures like free flaps, the time consumed for applying skin graft should be decreased and this technique is very useful in such cases. It can be applied to both small and large areas. It applies uniform pressure all over the graft bed as the whole area is covered by the synthetic towel. We can increase the pressure exerted by this tie-over dressing in an area by increasing the height of the sponge or stretch of the synthetic hand towel in that area. This method can be easily used in difficult areas like under the external fixator and male external genitalia. Sterile synthetic hand towel is freely available in the operation theatre. This method of dressing is aesthetically pleasing compared to other standard techniques. Patients did not complain of any issues

regarding this tie-over dressing. This tie over can be easily removed just by taking off the staples. Whenever, it is necessary to examine the graft, both the removal and replacement of the tie-over dressing by this method is easier than with other techniques.

**CONCLUSION:** 'Tent in' technique is a novel method for placing tie-over dressing. This method is simple, fast and easy to practice. Excellent graft take is obtained by this technique. Further studies are required to establish its advantages against other popular methods.

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