The British Association of Plastic Surgeons (2003) **56**, 498–503

BJPS
An International Journal of Surgical Reconstruction
www.bjps.com

Adhesive retention dressings are more comfortable than alginate dressings on split-skin-graft donor sites

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Received 14 July 2000; accepted 10 December 2002

KEYWORDS
Adhesive retention dressing; Mefix; Kaltostat; Donor; Skin graft; Pain

Summary Painful split-skin-graft donor sites remain a common problem for patients. We undertook a prospective randomised trial to examine the comparative comfort and ease of care of two different donor-site dressings. One dressing is the alginate Kaltostat, the standard plastic-surgical dressing in the UK and abroad, and the other is the adhesive retention tape Mefix, a novel use of a readily available dressing. We randomised 50 patients requiring split-skin grafts to receive either alginate (Kaltostat) or retention (Mefix) donor-site dressings. Dressings were assessed by interview and questionnaire at 24, 72 h and 2 weeks, and by wound review at 2 weeks. Retention dressings were found to be more comfortable, required less nursing intervention and allowed patients easier mobility with a greater range of daily activities, especially washing, without compromising wound healing. We recommend adhesive retention dressings as cost-effective comfortable dressings, which readily conform to any donor site.

Numerous 'dressings' have been promoted to aid healing,[1–31] and some have been suggested to reduce pain.[1–6,8,11–16,19,26,27,29–45] However, many of these studies are not prospective randomised controlled trials,[2,3,12,19,33,35,37,41,43,45] and some may be hampered by low numbers ($n < 20$ donor sites in each study group).[1,4,5,10,11,14,15,22,27,32,33,46] Statistically significant differences in healing time of a few days[1,11,13,21,28,30] do not necessarily translate into significant clinical gain for patients when reharvesting of donor sites is not the major consideration. Often the thickness of skin harvested and patient factors (age, steroids, etc.) are more relevant than the specific dressing in everyday practice. More important from a patient's point of view are differences between dressings with respect to pain, comfort and interference with daily activities.

We performed a prospective randomised trial to examine the comparative comfort and ease of care of two different donor-site dressings. Calcium-alginate dressings are the preferred plastic-surgical dressing in the UK and Australia.[47]

We and other surgeons, particularly in Australia,[43–45] have used retention dressings for many years, and our clinical impression that retention dressings (Mefix, Hypafix, Fixomull) are more comfortable and easier to care for than calcium-alginate dressings on split-skin-graft donor sites was

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S0007-1226/03/$ - see front matter
doi:10.1016/S0007-1226(03)00195-4

confirmed in an initial study.[48] This study was extended to increase the subject numbers and, thus, the power of the study.

Methods

We randomised 50 patients requiring split-skin grafts to receive either alginate (Kaltostat) or retention (Mefix) donor-site dressings. Surgeons harvested the grafts from the lateral thigh using a Zimmer dermatome set at 8–10. In the Kaltostat group, the alginate dressing was applied directly to the wound, covered with dressing gauze and bandaged. In the Mefix group, the adhesive retention dressing was applied directly to the wound. Care was taken to ensure that the adhesive was in direct contact with the raw surface and adherent for a margin of at least 2 cm around the donor site. This was then covered with gauze and a bandage. Externally, there was no difference in the dressings.

Patients were assessed by an independent person who was blinded to the dressing applied. Assessment was performed at 24, 72 h and on removal of the dressing at 2 weeks.

Pain and comfort were assessed by interview and questionnaire. These parameters were measured in several ways: a linear pain visual-analogue score was used to obtain objective pain measurements, analgesic requirements were assessed, and the timing of onset of pain, provocative factors and pain-relieving manoeuvres were determined.

Nursing intervention was assessed by recording the number of occasions on which the dressing slipped, required repadding, oozed or leaked, or soiled clothes, and the ease of removal. The gauze padding over the adhesive retention dressing was removed after assessment at 72 h, leaving the adhesive retention dressing exposed. These patients were allowed to wet the dressings and, hence, wash. Thereafter, the dressing was dried by either patting dry or using a hairdryer.

Interference with mobility and activities of daily living was assessed by asking the patient about the effect of the dressing on hygiene, the ability to wash or shower, mobility and movement. This was expressed as an incapacity score for ease of comparison.

Healing was assessed at 2 weeks, when the dressing was removed. The percentage area healed was recorded.

The plastic-surgery nurse scored the ease of removing the dressing, whilst the patient scored the comfort of the procedure. The dressing removals and assessments were performed by a variety of different nurses, none of whom had an interest in the trial. All other assessments were performed by a single researcher blinded to the type of dressing applied.

Results were analysed statistically by χ^2 testing on advice from the Oxford University Statistical Consulting Service.

Results

Donor-site pain was assessed by several different indices. An overall pain score was derived from the patient's pain scores at 24, 72 h and at the time of removal on a linear scoring system of 0–5 (0: no pain; 5: severe pain). Fig. 1 shows the pain scores for the 24 and 72 h assessments. At all times Mefix retention dressings were less painful than Kaltostat dressings ($P < 0.05$).

Patients were asked to evaluate pain at rest and on movement (Fig. 2, Table 1), and other discomfort, such as pain at night; pain requiring analgesia to control was also documented. Mefix was less painful in all parameters measured, statistically significantly so in relation to overall pain scores and those at rest and on movement, especially in the first 24 h.

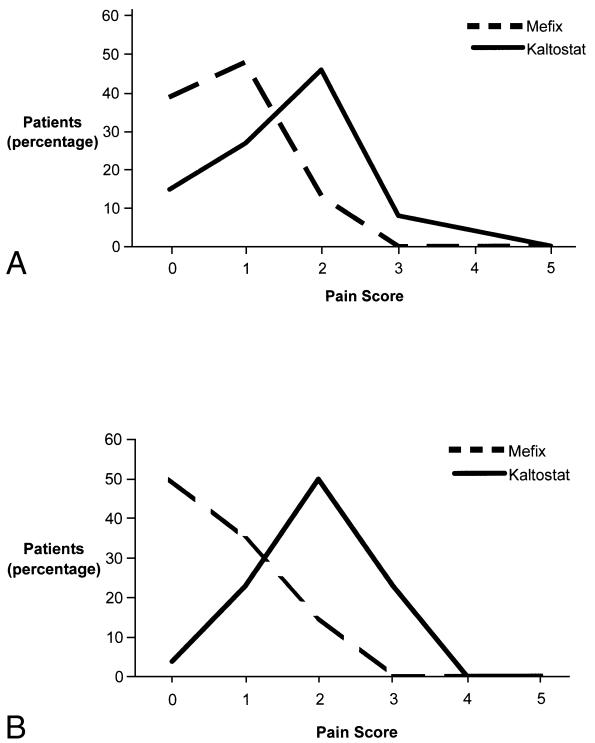

Fig. 1 Pain scores at (A) 24 h and (B) 72 h. Dashed line indicates Mefix and solid line indicates Kaltostat. Mefix is significantly less painful than Kaltostat ($P = 0.003$ at 24 h and $P = 0.0001$ at 72 h).

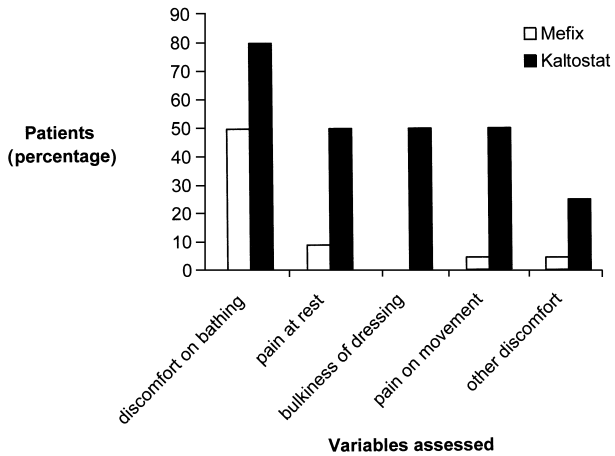

Fig. 2 Disability during treatment. Open bars indicate Mefix and solid bars indicate Kaltostat.

Significantly fewer patients with retention dressings reported moderate pain on removal (pain score of 2 or 3) than did those patients with calcium-alginate dressings ($P < 0.05$; Fig. 3).

Nursing care was compared by scoring the number of nurse events per patient. At 24 h the retention-dressing patients required an average of 1.1 nurse events per patient; the alginate-dressing patients required an average of 2.1 nurse events per patient. A similar difference was seen at 72 h, with an average of 1.4 nurse events for those with retention dressings and an average of 2.4 nurse events for those with calcium-alginate dressings (Fig. 4).

When asked about the influence of the donor-site dressing on their hygiene and mobility, 19 retention-dressing patients reported minimal or no interference, and only three reported moderate to high interference. By comparison, only eight alginate patients reported no or minimal interference and 12 reported moderate to high interference (Table 2).

Donor-site healing was complete in 91% of retention-dressing patients compared with 62.5% of patients with calcium-alginate dressings. The maximum area unhealed was 5% in the Mefix group and 10% in the Kaltostat group; these are small areas and not clinically significant.

Table 1 Incapacity during treatment

Variable	Mefix (%)	Kaltostat (%)	χ^2 test
Discomfort in bathing	11/22 (50)	16/20 (80)	$P = 0.08$
Pain at rest	2/22 (9)	10/20 (50)	$P = 0.009$
Bulkiness of dressing	0/22 (0)	10/20 (50)	$P = 0.0005$
Pain on movement	1/22 (4.5)	10/20 (50)	$P = 0.002$
Other discomfort	1/22 (4.5)	5/20 (25)	$P = 0.14$

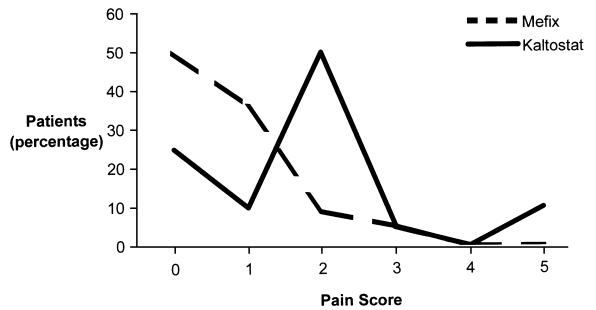

Fig. 3 Pain on removal. Dashed line indicates Mefix and solid line indicates Kaltostat.

Discussion

Most donor-site trials concentrate on one of two outcomes: wound healing and pain/comfort. Trials looking at wound healing show either no[21,39] or a few days[1,13,15,17,28,29] difference in wound-healing times and do not necessarily compare the trial dressing to the most frequently used dressing in the UK (Kaltostat) but may use simple paraffin or meshed-gauze control dressings.[6,8,13,14,25,26,29,39,41,49,50] The accuracy of wound-healing assessment is questionable as it requires removal of the dressing, thereby disturbing the healing process, and subjective assessment of the point of complete healing. The relatively small differences in healing times are arguably insignificant except where regrafting is vital, as in major burns. As the majority of skin-graft donor sites do not need reharvesting, the greatest potential for a dressing to make a clinical impact lies in addressing issues such as patient pain and comfort, quantity of nursing care, influence on patient independence and cost. Hence, this study concentrated on these parameters. We also examined healing times to assess whether the dressing had a detrimental effect. This showed that donor-site healing was complete in virtually all those dressed with adhesive retention dressings compared with only two-thirds of those dressed with calcium-alginate dressings. This result

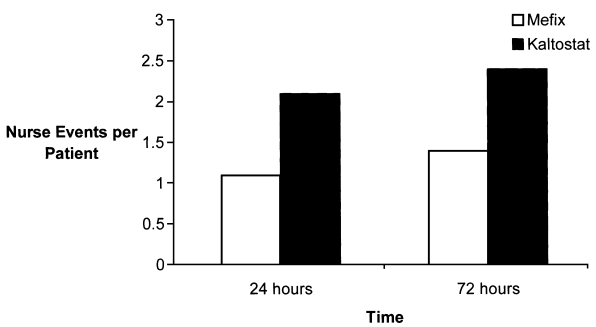

Fig. 4 Nursing care required in each group. Open bars indicate Mefix and solid bars indicate Kaltostat.

Table 2 Overall incapacity score (0: no incapacity during treatment; 10: maximum incapacity during treatment). Mefix results in significantly less incapacity than Kaltostat ($P = 0.009$)

Incapacity score	Mefix (%)	Kaltostat (%)
0	11/22 (50)	2/20 (10)
2	8/22 (36.5)	6/20 (30)
4	2/22 (9)	2/20 (10)
6	1/22 (4.5)	2/20 (10)
8	0 (0)	5/20 (25)
10	0 (0)	3/20 (15)

was not statistically significant because of the small range of area unhealed in each group. However, we can state that the use of an adhesive dressing was not detrimental to healing.

Previous studies of donor-site dressings that have looked at pain as an end point have limited their pain assessment to the first 24 h.[34] These studies showed that the topical administration of local anaesthesia reduced the pain. Although pain relief in the first 24 h is important, patients are generally receiving pain relief for their primary operative indication or procedure at that stage. Complaints about donor-site pain become more prevalent as operative-site pain diminishes. Hence, we studied pain over a longer period.

At 24 h overall pain scores were significantly lower in the Mefix group. The linear-pain-scale trend is paralleled by the results in the other pain indices. Similarly, at 72 h there is a large and significant difference in pain scores. In all indices except 'pain on movement' there is a dramatic difference, with the adhesive retention dressing being much less painful. This statistically confirms the trends seen in an earlier study.[48]

We believe the difference in pain scores relates to the thickness, bulk and mobility of the dressings. In the alginate dressings, the blood seeps through the alginate and clots in the layers of supporting gauze. This forms a very thick adherent stiff immobile block of tissue attached to the donor site. This block of dressing may irritate the underlying donor site. By comparison, the retention dressing allows blood to seep out onto the gauze, but this is not adherent and can be easily removed after 24–72 h, leaving the attached dressing as a mobile and very thin layer.

The lack of bulk, increased pliability and reduced pain of the retention dressing contribute to the increased mobility of patients and their greater ease of independent living. This is seen in the reduced scores given by those patients with retention dressings when asked about activities of daily living and hygiene. One enormous benefit of retention dressings is that they can get wet and, hence, patients with these dressings are able to shower and bathe. The dressings are patted dry or left to air dry. Owing to the gauze padding on the alginate dressing, it cannot get wet without risk of macerating the underlying skin.

Alginate dressings required twice as much nursing intervention as retention dressings. Generally this was due to the bulk of the dressing, the persistence of the gauze pad and the difficulty in maintaining nonadherent dressings on the tapering thigh. Interventions, such as repadding and rebandaging, and slipped dressings contribute to symptomatolgy and interference with activity.

Removal of the adhesive retention dressing was more comfortable as the adhesive is oil-soluble. Oil (e.g. olive oil or peanut oil) is applied to the external surface of the dressing at home, the leg is wrapped in cling film to protect clothing and the oil is allowed to soak in; the dressing then lifts off easily in clinic. (However, in routine practice we leave the retention dressing tape on until it self-separates.) The alginate dressing is also soaked off using saline or oil. The difference in comfort on dressing removal may be due to a number of factors, such as the higher incidence of incomplete healing in the alginate-dressed wounds (although only small areas are involved) and the thickness and stiffness of the alginate dressing or its adherence.

Conformability makes adhesive retention dressings ideal for donor sites that are difficult to dress, such as the tapering upper thigh and the arm, and the ability to wash makes them especially useful in children when the buttocks are used.

In conclusion, this prospective randomised trial demonstrates that adhesive retention dressings are more comfortable, less painful, easier to care for, require less nursing intervention and allow a greater range of mobility and activities than the current standard calcium-alginate dressing for split-skin-graft donor sites, without compromising wound healing.

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