The Royal College of Surgeons of England

Ann R Coll Surg Engl 2001; **83**: 431–434

Original article

Adhesive retention dressings are more comfortable than alginate dressings on split skin graft donor sites – a randomised controlled trial

Henk Giele, Amanda Tong, Sophie Huddleston

Department of Plastic Surgery, Radcliffe Infirmary, Oxford, UK

A prospective randomised trial examining the effectiveness, comparative comfort and ease of care of two different split skin graft donor site dressings was performed. One of the dressings was an alginate (Kaltostat®), and the other an adhesive retention tape (Mefix®). Alginates are the standard plastic surgical dressing, whereas the use of adhesive retention tapes as a donor site dressing presents a novel use of a readily available product. A total of 30 consecutive patients requiring split skin grafts were randomised to receive either alginate or retention donor site dressings. Dressings were assessed by interview and questionnaire at 24 h and 48 h and at 2 weeks, and by wound review at 2 weeks. Retention dressings were found to be more comfortable. They also required less nursing care and attention. The retention dressings allowed the patients easier mobility and a greater range of daily activities, especially washing. There was no significant difference in wound healing nor in complications. Adhesive retention tape applied directly to the split skin graft donor site wound is an effective, cheap and comfortable dressing requiring little postoperative care.

Key words: Adhesive retention dressings – alginate dressings – Split skin graft donor sites – Randomised controlled trial

Painful split skin graft donor sites remain a common problem, particularly to patients. Numerous donor site dressings have been promoted to aid healing,[1–3] and some have been suggested to reduce pain.[4] There does not seem to be any clinically significant difference in rate of healing between dressings, as factors such as depth of skin harvested and patient variables are more relevant.[5,6] However, there does seem to be some

Correspondence to: Henk Giele, Department of Plastic Surgery, The Radcliffe Infirmary, Woodstock Road, Oxford OX2 6HE, UK
Tel: +44 1865 224793; Fax: +44 1865 311673; E-mail: henk.giele@surgery.oxford.ac.uk

substantial differences between dressings with respect to pain and comfort.[4,5]

A prospective randomised trial examining the effectiveness, comfort and ease of care of two different donor site dressings was performed. Calcium alginate dressings are the commonest plastic surgical dressing. However, we and other surgeons particularly in Australia, have used retention tape dressings on split skin graft donor sites for many years,[7,8] and our clinical impression is that retention dressings (Mefix®, Hypafix®, Fixomull®) are more comfortable and easier to care for than calcium alginate dressings. We performed this trial primarily to determine which dressing would be the most comfortable for the patients, but also wanted to compare their effectiveness and ease of care.

Patients and Methods

A total of 30 consecutive patients who were scheduled for split skin grafting were prospectively randomised to receive either calcium alginate or adhesive retention dressings for their donor sites. The split skin grafts were harvested from the thigh using an air-powered dermatome (Zimmer) with the depth setting on 10.

In patients so randomised, the sheet of calcium alginate was applied directly to the wound, covered with dressing gauze and then bandaged. In the other patients, the adhesive retention dressing was applied directly to the wound with the adhesive in direct contact with the raw surface adhering for a margin of at least 2 cm around the donor site. This was then covered with gauze and a bandage.[7,8] Apart from the layer in direct contact with the wound, there was no difference in the dressings.

The assessments were performed by an independent person blinded to the dressing applied. Assessment was performed at 24 h and 72 h and on removal of the dressing at 10–14 days. Pain and comfort was assessed by an interview and questionnaire. Pain and comfort were assessed by a number of different modalities and also by negative questioning to reduce bias. Assessment of analgesic requirements, timing of onset of pain, provocative factors, and pain relieving manoeuvres was also performed as further measures of pain and comfort. Where appropriate, a linear pain score was used to obtain objective measurements.

Dressing care was assessed by recording the number of occasions the dressing slipped, required re-padding, oozed or leaked, soiled clothes, and ease of removal. The gauze padding over the adhesive retention dressing was removed after 72 h leaving the adhesive retention dressing exposed. These patients were allowed to wet these dressings and hence wash. The gauze padding over the alginate dressing could not be removed, a factor important in the comfort and ease of care of these dressings.

Interference of mobility and activities of daily living were assessed by questioning the effect of the dressing on hygiene, the ability to wash or shower, mobility and movement.

Healing was assessed at 10–14 days when the dressing was removed. The percentage area that was healed was recorded by planimetry. Ease of removal of the dressing was scored by the nurse whilst the patient scored the comfort of the procedure. These dressing removals and assessments were performed by a variety of different nurses none of whom had an interest in the trial.

Results were analysed statistically by chi squared testing on advice from the university statistical consulting service.

Results

Pain

Donor site pain was assessed by several different indices. An overall pain score was derived by combining the results of each of these indices, allowing comparison overall as well by each index.

In the overall pain score, there is no statistically significant difference between dressings at 24 h, although a slight trend for the retention dressing to be less painful is seen. However at 72 h, there are only 16% of retention dressing patients reporting considerable pain as compared to 49% of alginate dressing patients. This is

Table 1 Components of pain indices measured at 24 h and 72 h

Components	24 h		72 h	
	Retention	Alginate	Retention	Alginate
Percent with pain level > 1	33	42	13	80
Percent needing analgesia	17	47	29	55
Percent with night pain	25	29	0	50
Percent with pain at rest	25	29	7	30
Percent with pain on movement	25	36	33	30
Overall pain scores	25	37	17	49

statistically significant ($P < 0.05$). Table 1 shows the components of the overall pain score for the 24 h and 72 h assessments.

Linear pain scale results show no significant difference in the first 24 h; however, at 72 h there is significantly less pain in the retention dressing group ($P < 0.05$).

Similarly, there is no statistically significant difference between the dressings on the other pain indices, except for pain on movement at 24 h, but these are significant at 72 h.

Pain on removal was moderate in 20% of those patients with retention dressings compared with 50% of calcium alginate dressings ($P < 0.05$).

Ease of care

Nursing care was compared by scoring the number of nurse events per patient. At 24 h, the retention dressing patients recorded 14 nurse events for 12 patients, an average of 1.1 per patient. The alginate dressing patients required 30 nurse events for 14 patients, an average of 2.1 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 events in those with calcium alginate dressings.

This increase of nurse involvement in the care of the alginate dressings occurred across all categories studied.

Hygiene and mobility

On assessment of the influence of the donor site dressing on the patients' hygiene and mobility, the retention dressing patients recorded minimal or no interference in 9 patients and moderate-to-high interference in only 3 cases. By comparison, the alginate patients reported only 4 cases of low-to-minimal interference and had 4 in the moderate-to-high category.

Healing

Donor site healing was complete in 91% of retention dressing patients but in only 62.5% of patients with calcium alginate dressings.

Discussion

The ideal donor site dressing is one that optimises wound healing, is cheap and easy to use from both the surgical and nursing perspective, is pain-free and causes minimal interference with the patient's hygiene and mobility.

Most donor site trials concentrate on two outcomes – either wound healing or pain and comfort. The trials looking at wound healing show little significance, particularly clinically, between donor site dressings. The greatest difference between dressings are in pain and comfort, quantity of nursing care and influence on patient activity. Dressings that require minimal nursing involvement and allow maximal patient independence are required.

Experience using adhesive retention tape as a SSG donor site dressing suggested that this dressing most closely approached the ideal. This prospective randomised trial was performed to evaluate our clinical impressions. The adhesive retention tape is applied directly to the donor site wound. The adhesive adheres to the normal skin at the margins of the wound, but not to the moist wound itself. This is the reason for ensuring that there is an overlap of tape of at least 2 cm around the wound. The blood and exudate from the wound escape through the pores of the tape and are absorbed into the overlying gauze. When this ooze ceases, generally after 24–48 h, the gauze can easily be removed leaving the tape adherent to the skin and donor site. The tape is then left for 14 days or until it drops off by itself. This occurs when the wound has epithelialised. As the tape is thin and easily dried, it may be washed and even bathed.

At 24 h, no statistically significant difference in pain scores can be seen, though a trend is visible that suggests that the retention dressing is less painful. The linear pain scale trend is paralleled by the results in the other pain indices. At 72 h, the difference is startling and significant. In all indices except pain on movement, there is a dramatically less pain experienced by those patients randomised to retention tape dressings.

Previous studies on donor site dressings that have looked at pain as an end point have limited their pain assessment to 24–48 h.[4] These studies showed that the topical administration of local anaesthesia reduced the pain during this period. Although pain relief in the first 24 h is obviously important, patients are generally receiving pain relief for their primary operative procedure at that stage. Complaints about donor site pain become more prevalent as operative site pain diminishes. It seems logical that initial donor site pain is due to the harvesting of the graft itself and the dressing has relatively little influence, whereas subsequent pain due to the raw wound surface can be subject to greater influence by external forces such as dressings.

We believe the reduction in pain with retention dressings is due to the lack of bulk and stiffness of dressing seen commonly with calcium alginate dressings. With the latter 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. As this block of dressing is relatively immobile, it irritates the underlying donor site particularly with movement. By comparison, the retention dressing allows the blood to seep out onto the gauze, but this is not adherent and hence the dressing is mobile and the attached dressing very thin.

The lack of bulk and increased pliability of the retention dressing as well as the reduced pain contribute to the increased mobility of the patients and the greater ease of independent living. This is seen in the reduced scores given by those patients with retention dressings when asked questions concerning 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 or left to air-dry. Due to the gauze padding adhering to the alginate dressing, it can not get wet without risk of macerating the underlying skin.

Retention dressings required half as much nursing care as the alginate dressings. In all nursing care categories, alginate dressings required more attention. Generally, this was due to the bulk of the dressing, the persistence of the gauze pad, and the difficulty maintaining dressings that are non-adherent on the tapering thigh. Naturally, these interventions such as re-padding, re-bandaging, and slipped dressings also contribute to increased symptoms and interference with activity.

Removal of the dressing was more comfortable with the adhesive retention dressing. The adhesive is oil-soluble. Oil is applied to the external surface of the dressings and allowed to soak in. The dressing then generally lifts easily off. When patients are not being assessed for purposes of the trial, we tend to leave the dressing until it self-separates. The alginate dressing is also soaked off by using saline or oil. The difference in comfort on dressing removal maybe due to a higher incidence of incomplete healing in the alginate dressed wounds. It may also be due to the thickness and stiffness of the alginate dressing.

Donor site healing was complete in virtually all of those dressed with adhesive retention dressings compared to only two-thirds of those dressed with calcium alginates. This result was somewhat surprising, as we expected the healing times to be equal. Previous studies comparing donor site dressing healing times have only found very small, clinically insignificant, differences – at most in the order of a day. Frequently, studies finding one dressing superior in healing to another[1–3] are contradicted by other studies finding the opposite[9,10] or no difference.[4–6]. Our rather large difference may be due to the small sample number, but warrants further investigation.

Though a comprehensive cost analysis was not performed, it seems that retention dressings are a much cheaper option than alginate dressings. Not only is the initial dressing cost lower, but retention dressings required less nursing input and less re-dressing material.

Conclusions

This prospective randomised trial demonstrates that adhesive retention split skin graft donor site dressings are more comfortable, less painful, easier to care for, and allow greater mobility and activity than the current standard calcium alginate dressing, whilst not compromising on wound healing effectiveness.

References

1. Basse P, Siim E, Lohmann M. Treatment of donor sites – calcium alginate versus paraffin gauze. *Acta Chir Plast* 1992; **34**: 92–6.
2. O'Donoghue JM, O'Sullivan ST, Beausang ES, Panchal JI, O'Shaughnessy M, O'Connor TPF. Calcium alginate dressings promote healing of split skin graft donor sites. *Acta Chir Plast* 1997; **39**: 53–5.
3. Vanstralen P. Comparison of calcium sodium alginate (KALTOSTAT®) and porcine xenograft (E-Z DERM) in the healing of split-thickness skin graft donor sites. *Burns* 1992; **18**: 145-8.
4. Butler PEM, Eadie PA, Lawlor D, Edwards G, McHugh M. Bupivicaine and Kaltostat® reduce postoperative pain. *Br J Plast Surg* 1993; **46**: 523–4.
5. Bettinger D, Gore D, Humphries Y. Evaluation of calcium alginate for skin graft donor sites. *J Burn Care Rehabil* 1995; **16**: 59–61.
6. Steenfos HH, Agren MS. A fibre free alginate dressing in the treatment of split thickness skin graft donor sites. *J Eur Acad Dermatol Venereol* 1998; **11**: 252–6.
7. Sperring B, Crocker A. Management of donor site wounds. *Primary Intention* 1996; **3**: 25–8.
8. Giele H. Retention dressings: a new option for donor site dressings. *Aust J Dermatol* 1997; **38**: 166.
9. Porter JM. A comparative investigation of re-epithelialisation of split skin graft donor areas after application of hydrocolloid and alginate dressings. *Br J Plast Surg* 1991; **44**: 333–5.
10. Lawrence JE, Blake GB. A comparison of calcium alginate and scarlet red dressings in the healing of split skin graft donor sites. *Br J Plast Surg* 1991; **44**: 247–9.