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Whitehead's varnish and Jelonet—a better dressing for skin graft donor sites than Jelonet alone

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Summary

Two methods of skin autograft donor site management were evaluated in 40 patients in a prospective randomised double-blind clinical trial. Donor sites were dressed using either a standard dressing of Jelonet®, gauze, wool and a crêpe bandage or Jelonet, Whitehead's varnish (compound iodoform paint BPC), gauze, wool and a crêpe bandage. Donor site pain was assessed daily using a linear analogue scale, and the healing time of the donor area was recorded. Whitehead's varnish significantly reduced donor site pain compared to the standard dressing (P=0.0006). Although overall healing time was not statistically different in the two groups, larger donor sites treated with Jelonet and Whitehead's varnish healed more quickly than those treated with the standard dressing alone.

Introduction

Patients who have undergone split-thickness skin grafting as treatment for an area of skin loss often have more pain and discomfort at the donor area than at the recipient site *(1)*. In addition, although donor area healing usually occurs without complication, there are occasions when infection slows this process, and can even cause conversion to a full-thickness defect *(2)*. To overcome these problems a number of different skin graft donor site dressings have been advocated yet opinion continues to vary as to which is the best.

This study further investigates the management of the donor site, by comparing the results of treatment using a Jelonet® dressing with the results obtained when Whitehead's varnish (compound iodoform paint BPC) and Jelonet are combined.

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Patients and methods

With the approval of the Ethical Committee this study was undertaken by the Department of Reconstructive Plastic Surgery and the Burns Unit at the Northern General Hospital, Sheffield. Forty patients formed the study group. Patients who were sensitive to iodine were not included, but apart from this the series was consecutive. All patients were undergoing split-thickness skin grafting for a variety of surgical conditions (Table I).

Before each operation the surgeon opened a sealed envelope within which was written the type of donor dressing to be applied. The standard dressing consisted of a layer of Jelonet, gauze, wool and a crêpe bandage. The trial dressing consisted of a single layer of Jelonet on top of which a sufficient quantity of Whitehead's varnish was applied so as to completely cover the donor area. The dressing was completed using gauze, wool and a crêpe bandage. A small amount of Whitehead's varnish

TABLE I *Indications for split-thickness skin grafting*

Indication	*Standard dressing (n=20)*	*Whitehead's varnish dressing (n=20)*
Burn	2	5
Burn contracture	3	1
Basal cell carcinoma	4	2
Squamous cell carcinoma	2	3
Naevi	2	1
Malignant skin lesions	2	1
Benign skin lesions	2	3
Leg ulcers	3	1
Trauma with skin loss	0	3

was also placed on the outer dressings of all patients so that the two groups could not be distinguished by the characteristic smell of the Whitehead's varnish.

Postoperatively an independent observer (DS) assessed the patients for donor site pain by means of a 10 cm linear analogue scale. This assessment was 'double-blind' since neither the examiner nor the patient knew which dressing had been applied. Assessment was performed daily until the donor area was inspected on the tenth postoperative day. When the donor dressing was removed the donor area was photographed. If healing was not complete a further Jelonet dressing was applied. The time taken for the donor area to fully heal was recorded.

The data obtained was analysed statistically using the χ^2 test and the Mann-Whitney U test (with a significance level of $P=0.05$) applied as a two-tailed test.

Results

Fourteen men and 6 women (mean age 45.3 years) had the standard donor site dressing, while in 11 men and 9 women (mean age 51.8 years) the donor site was dressed with Jelonet and Whitehead's varnish. The donor site for all grafts was either the thigh or upper arm. In those patients who had the standard dressing the donor area varied from 32 cm^2 to 875 cm^2 (median 125 cm^2). In the Whitehead's varnish group the median donor area was larger at 225 cm^2 with a range of 24–1500 cm^2. Even when the largest donor area in this group was excluded the median size was still larger than in the standard dressing group, being 200 cm^2.

Pain scores for all patients during the 10-day postoperative period are shown in Fig. 1 and graphically in Fig. 2. None of the patients who received the standard Jelonet dressing were pain free for the whole postoperative period, whereas this did occur in 7 of the 20 patients who had the Jelonet and Whitehead's varnish dressing. This difference was found to be statistically significant ($P=0.005$) when analysed using the χ^2 test. In addition, when the least favourable postoperative day for Whitehead's varnish (day 2—Fig. 1) was compared with the standard dressing using the Mann-Whitney U test applied as a two-tailed test, the difference in pain control was also found to be statistically significant $P=0.0006$. No difference in oral analgesic consumption was found in the two groups.

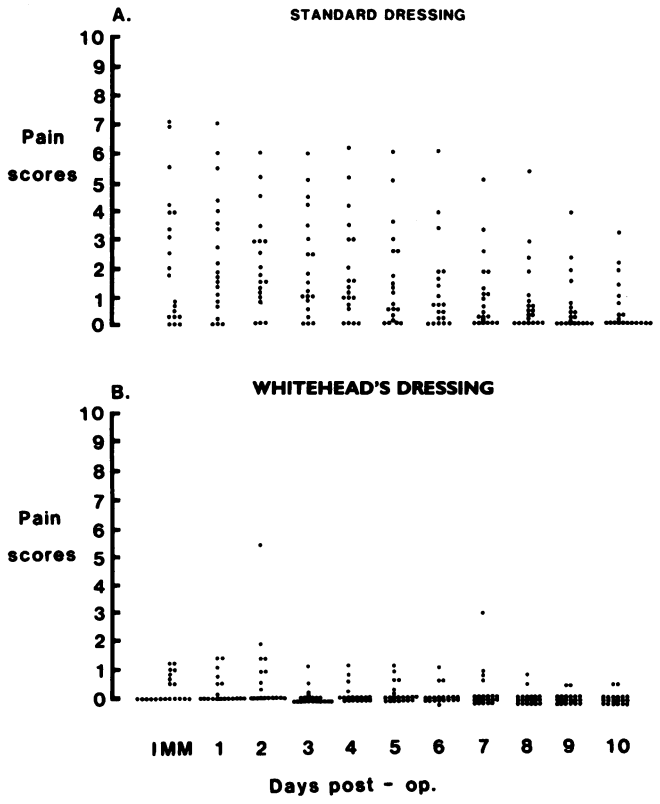

FIG. 1 Pain scores in the postoperative period for patients treated with the standard Jelonet dressing and those treated with Jelonet and Whitehead's varnish.

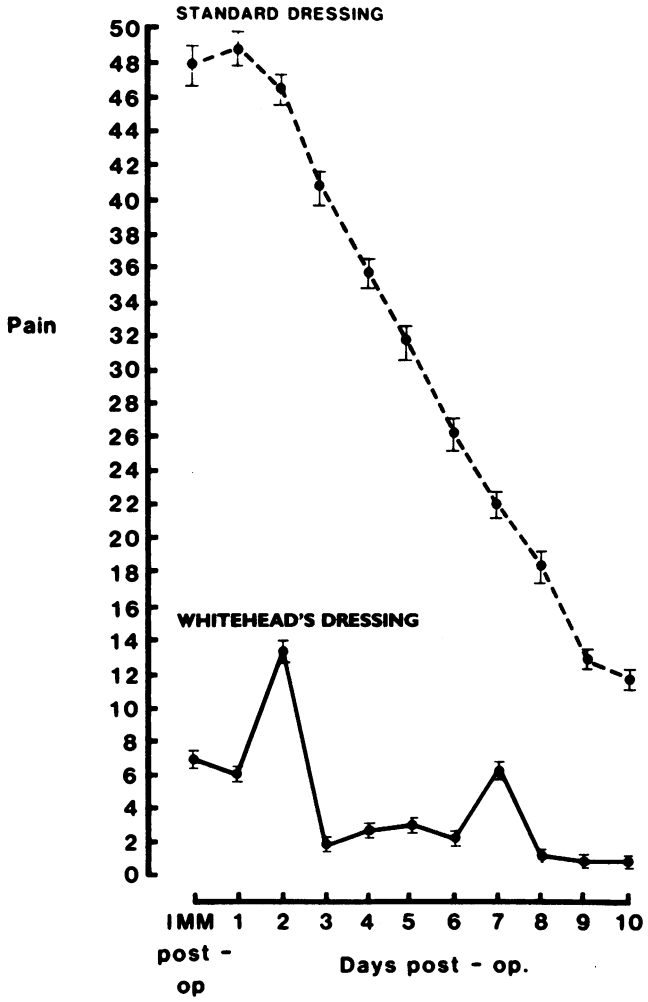

FIG. 2 Total daily accumulated pain scores for patients treated with the standard Jelonet dressing and those treated with Jelonet and Whitehead's varnish. Standard deviations are marked.

Of particular interest was one patient who required skin grafting on two separate occasions. Adjacent areas of the thigh were used as the donor site. At the first operation the donor dressing was Jelonet and Whitehead's varnish, while at the second operation only Jelonet was used. The differences in pain scores are shown in Fig. 3. It is clearly seen that despite the donor area being larger at the first operation the pain scores were lower.

The healing time in the two groups was not significantly different—standard dressing 9 to 29 days (mean 13 days), Whitehead's varnish group 9 to 20 days (mean 12 days). However, when the number of donor areas

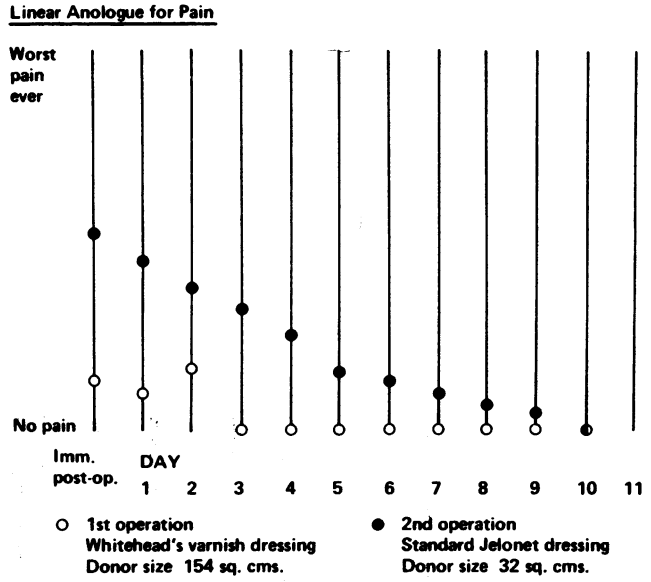

FIG. 3 Pain scores for the patient who underwent skin grafting twice during the study period. At the first operation the dressing was Jelonet and Whitehead's varnish and at the second operation Jelonet only was used.

TABLE II *Donor site healing in relation to donor site size*

Size of donor area cm²	*Donor sites fully healed by 10 days*			
	Standard dressing		*Whitehead's varnish*	
	n	%	*n*	%
Less than 100 cm²	8	75	6	83
100–250 cm²	8	50	6	83
Greater than 250 cm²	4	50	8	62

that were fully healed at 10 days are related to the size of the donor area in cm^2 (Table II), it is seen that a greater percentage of larger donor areas treated using Whitehead's varnish were healed at this time than when the standard Jelonet dressing was used.

Discussion

The optimal treatment for split-thickness skin graft donor areas is a dressing which reduces donor site pain, promotes healing, reduces the risk of donor site infection, and is inexpensive. In an effort to find a dressing that fulfils these criteria many different substances have been applied to donor sites and many trials performed comparing different treatments.

Johansen and Sorensen *(3)* compared six types of mesh gauze dressing and the exposure technique and concluded that Jelonet and coarse mesh gauze with 2% Fucidin® were the best both as regards healing time and quality. Brady *et al. (2)* in their comparison of five different dressings also found Jelonet had the shortest healing time. OpSite® which was also used in this study was shown to be the most effective at reducing donor site pain—a finding which confirmed the earlier experience of James and Watson *(4)*. The major disadvantage with OpSite, however, is that it is expensive and can cost up to four times that of Jelonet, depending on the size of the donor area *(2)*. In addition, adequately securing OpSite to the donor area can be difficult *(2)*.

In this study a standard Jelonet dressing was compared with a Jelonet dressing incorporating Whitehead's varnish (compound iodoform paint BPC). The improvement in pain control that has been achieved by the addition of Whitehead's varnish is clear, and has been shown to be statistically significant. This improvement occurred despite the fact that the median size of the donor areas in the Whitehead's varnish group was larger than in the standard dressing group. In addition, although the overall healing time of the donor areas in the two groups is not statistically different, there is evidence that larger donor areas heal more quickly when Whitehead's varnish is incorporated into the dressing (Table II). Healing using a standard Jelonet dressing has already been shown to be acceptable *(2,3)*.

The mechanism of action of Whitehead's varnish is most clearly understood when its constituents are known. These are: iodoform 10 g, benzoin 10 g, starch 7.5 g, natural balsams 5 g and solvent ether to 100 ml. The iodoform *(5)* has a marked anaesthetic action when applied to mucous membranes and it is proposed that it has a similar action on split-thickness skin graft donor sites. This would account for the improvement in pain relief seen in this study. In addition, when applied to the tissues, elemental iodine is slowly released which has a mild disinfectant action. This may have the advantage of reducing the incidence of donor site infections. The natural balsams give the solution properties of adherence and thus reduce the risk of the dressings moving on the donor surface. If movement occurs epithelialisation of the donor area is disturbed delaying healing and possibly also causing further donor site pain.

A further advantage of Whitehead's varnish is its low cost, 155p for 100 ml, and thus there is only a minimal increase in the total cost of the donor site dressing.

The major disadvantage of the solution resides in the fact that it should not be used in anyone with an iodine sensitivity. With this exception we feel that when combined with Jelonet it provides an improved dressing for split-thickness skin graft donor sites compared with Jelonet alone.

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