

Pinch Grafting of Leg Ulcers

A Retrospective Study of 412 Treated Ulcers in 146 Patients

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In a retrospective study of 412 leg ulcers in 146 patients treated with pinch grafting, with a mean duration of follow-up of 32 months (range 2–84), the overall healing rate was 38%. The healing rate was best in the vasculitic ulcers (56%), followed by venous ulcers (38%), arteriosclerotic ulcers (33%), mixed ulcers (33%) and "other ulcers" (20%). In the series as a whole, the mean duration of ulcer problems was 8 years, and that of the 412 ulcers treated 2.5 years; the mean recurrence rate was 28%, and the mean remission time 12.5 months. In the ulcers that were still healed at close of the study (comprising 27% (112/412) of the series), the remission time was ≥ 26.6 months. Thus we consider pinch grafting to be a successful complement to conservative therapy in most types of ulcers.

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The technique of using small skin grafts in order to heal an ulcer was introduced by Reverdin in 1872 (1) and later modified by Davis (2). Since 1989, we have treated leg ulcer patients with a modified version of the pinch graft method, using small pieces of full-thickness skin. This retrospective study was performed to determine the healing rates and remission times in leg ulcers of different aetiology in a larger series. During the period of 1990–1996, we pinch-grafted 415 ulcers in 149 patients, and we were able to follow the outcome of 412 ulcers in 146 of these patients.

MATERIAL AND METHODS

The leg ulcers of 149 patients were treated with the pinch graft method. A total of 415 ulcers were treated on 252 occasions, 62 patients being grafted more than once, at most six times. The ulcers were divided mostly on clinical grounds into five subgroups: venous, arteriosclerotic, vasculitic, mixed and others. Ulcers were defined as arteriosclerotic when the ankle index < 0.7 and no other pathological findings could explain the ulcer. The mixed ulcers could be combined, venous and arteriosclerotic, or such ulcers together with vasculitic elements. The venous ulcer subgroup ($n=207$) comprised 20 men (mean age 71, range 46–86 years) and 45 women (mean age 76.5, range 36–87 years), the arteriosclerotic ulcer subgroup ($n=39$) 4 men (mean age 82, range 72–88 years) and 10 women (mean age 77, range 54–92 years), and the vasculitic ulcer subgroup ($n=43$) 2 men (mean age 69.5, 67 and 72 years) and 17 women (mean age 71, range 41–89 years). The mixed ulcer subgroup ($n=108$) comprised 7 men (mean age 83, range 67–88 years) and 29 women (mean age 80, range 69–92 years). The "other ulcer" subgroup comprised 4 men (mean age 62, range 52–71 years) and 8 women (mean age 58, range 33–88 years), mainly with traumatic ulcers and no other pathological findings to explain their ulcer, but also some with hypertensive ulcers and one patient with Werner's syndrome. In the series as a whole (149 patients), the mean duration of ulcer problems was 8 years and that of the ulcer

treated 2.5 years. Of the 415 ulcers treated, 198 (i.e. almost half) were of more than 12 months' duration.

Pinch grafting was postponed until any ulcer infection or any general disease of significance was adequately under control, and a clean, granulating surface had been obtained. The anterolateral aspect of one thigh was used as the donor site and was locally anaesthetized with lignocaine 1%. Pinch grafts, with a diameter of 3 to 5 mm, were obtained by using a cannula or pincette to raise the skin, avoiding subcutaneous fat when harvesting the graft. The grafts were temporarily stored in a sterile solution of physiological saline and then placed over the ulcer 2–5 mm apart, to avoid epithelial overlap and to allow discharge of wound secretion. The newly pinched ulcer was dressed with vaseline gauze, covered with an occlusive dressing consisting of moist physiological saline compresses, and finally a pressure bandage. The donor site was dressed with vaseline gauze and a dry bandage and left untouched for a week. The patients were confined to bed for 1 week (but allowed toilet privileges). The vaseline gauze directly overlying the newly pinched ulcer was not touched during this time. If secretion was profuse, the saline compresses overlying the vaseline gauze were changed every day. After a week the vaseline gauze was carefully removed and replaced by a double dressing consisting of ointment-impregnated stockinette, held in place by a roll-on elastic bandage (3). However, the compression was individualized according to the type of ulcer.

The average number of pinch grafts per operation was 46, ranging from 1 to 260 according to the size of the ulcer. The ulcers were defined as small (< 4 cm²), medium (4–25 cm²) or large (> 25 cm²). The healing rate was recorded in weeks, as well as "healed within 2 months" and "healed between 2 and 6 months". As we have seen that the healing time differs from patient to patient and even continues after some months, we have chosen up to 6 months as the ultimate healing time for healing by pinch graft, aware that after such a long time even other factors might be responsible for the healing as well. Healing was defined as complete reepithelialisation. Thus, those ulcers which healed after more than 6 months were defined as not healed by the pinch grafting. However, we also noted whether such ulcers were improved, improvement being defined as a smaller or a more superficial ulcer than before the pinch grafting. The mean duration of follow-up was 32 months (range 2–84), and the remission time for the various leg ulcer subgroups was recorded.

RESULTS

In the series as a whole, the mean healing time was 9.4 weeks. The healing rate was 22% (91/412) at a 2-month follow-up, and 38% (155/412) at a 6-month follow-up – i.e. the healing rates for the diagnostic subgroups were as follows: venous ulcers, 38%; arteriosclerotic ulcers, 33%; vasculitic ulcers, 56%; mixed ulcers, 33%; and "other ulcers" 20%. In addition, 133 ulcers were deemed to be improved at the 6-month follow-up, which – together with the 155 that were already healed – brings the proportion of healed or improved ulcers up to 70% (288/412). The shorter the duration of the ulcers before the pinch graft treatment, the better the healing rate (Fig. 1).

Comparison of healing rates with ulcer size showed results to be best in the small and medium-sized ulcer subgroups,

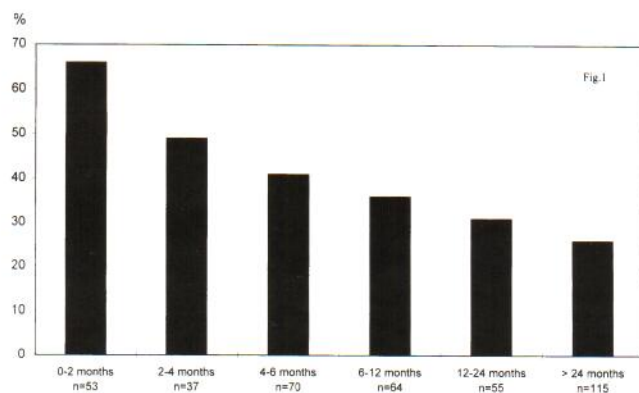


Fig. 1. Healing rate, compared to ulcer duration, in 394 ulcers (n = number of ulcers).

Table I. Healing in relation to ulcer size in 394 ulcers (n = number of ulcers)

Ulcer size, cm ²	n	% healed
< 4	136	46
4-25	160	41
> 25	98	20

with a healing rate of 43%. However, pinch grafting was successful in 20% of the large ulcers (Table I).

The mean hospital stay was 30 days (range 8-90). Patients were often discharged from hospital with their ulcers healing, but not completely healed.

Of the 149 patients treated with the pinch graft method, 146 were available for follow-up, the mean duration of which was 32 months (range 2-84). During the follow-up period, 18.5% (27/146) of the patients died, which may have affected the figures obtained for remission times and for recurrence rates.

Among the 155 healed ulcers, the recurrence rate was 28% ($n=43$). Twenty-seven per cent of the venous ulcers recurred at a mean of 13.8 months after healing; 38% of the arteriosclerotic ulcers recurred after a mean of 5 months; 25% of the vasculitic ulcers after a mean of 15 months; 28% of the mixed ulcers after a mean of 15 months; and 1 of the 3 healed ulcers in the small group of "other ulcers" recurred after 3.5 months. Thus the mean remission time for the ulcers which recurred was 12.5 months. However, for the 112 ulcers that were still healed at close of the study, the remission time was 26.6 months or more.

There were no cases of deep vein thrombosis, erysipelas or other serious complications in connection with the grafting. Heparin was given prophylactically to all patients pinch-grafted during the 2 last years of the study. Sometimes there were clinical signs of slight ulcer infection in the pinch graft area or in the donor site. These patients were given local or systemic antibiotics (20%).

DISCUSSION

In our study the overall healing rate of venous ulcers treated with the pinch graft method was 38%. Although some earlier studies have yielded better success rates with this method (4, 5), the patients in our study were old, they had had their ulcer

problems for a long time and earlier treatment modalities had failed, which may to some extent account for our lower success rate. The healing rate in the arteriosclerotic subgroup was 33%, only 5% less than that for the venous ulcer subgroup, a finding in agreement with those of another study showing that arteriosclerotic ulcers can be pinch-grafted with good results (4). In the present study, 5 patients in the arteriosclerotic ulcer subgroup had undergone percutaneous transluminal angioplasty or distal bypass not long before the pinch grafting. With regard to the high healing rate of 56% in the vasculitic ulcer subgroup, it should be borne in mind that most of these patients had also received immunosuppressive therapy, the pinch grafting having been performed after the vasculitic activity had decreased. The occurrence of comparable healing rates (of 33%) in the mixed ulcer and arteriosclerotic ulcer subgroups is not surprising, in view of their having some aetiological features in common. Unlike other investigators (6), we found the healing rate to be lowest in the "other ulcer" subgroup. However, this subgroup contained only 12 patients, and the lesions did not solely consist of traumatic ulcers but also included hypertensive ulcers, and one of the patients had Werner's syndrome as well.

The mean age of the patients was 74.1 years, and the mean duration of their ulcer problems 8 years, 115 ulcers being more than 24 months old. The advanced age of the patients and the long duration of their ulcer problems are reflected in the complexity of the cases.

The mean healing time was 9.4 weeks. Although shorter healing times have been reported from other studies (4, 5), those patients remained in hospital until completely healed and could be examined every day. Our patients were often discharged from hospital with their ulcers healing, though not completely healed, and healing was first recorded when the patients came for a check-up 1 or 2 months later. Accordingly, the true healing time in our series may well have been somewhat shorter.

We found the recurrence rate to be 28% in all healed ulcers ($n=155$), 27% in the venous ulcer subgroup, 38% in the arteriosclerotic ulcer subgroup, 25% in the vasculitic ulcer subgroup, 28% in the mixed ulcer subgroup, and 33% in the "other ulcer" subgroup. The low recurrence rates may reflect good postoperative care after discharge from hospital, with more correct use of pressure bandages etc. In all subgroups, except for the arteriosclerotic and the small "other ulcer" subgroups, the relapses occurred late, after 13.8 months in the venous ulcer subgroup, and after 15 months in the vasculitic and mixed ulcer subgroups. In the arteriosclerotic ulcer subgroup, the relapses occurred after a mean of only 5 months. Early relapses in this subgroup have also been reported by other authors (5, 6). In the ulcers that were still healed at the close of the study (comprising 27% (112/412) of the series), the remission time was ≥ 26.6 months.

A noteworthy finding in our series, and one in contrast to those of others (5), was that ulcers which healed after a 2-month follow-up were less prone to relapse than ulcers that healed within 2 months.

This study of a large series of treated ulcers showed pinch grafting to be a very good complement, or even a viable alternative to conservative therapy in most types of leg ulcers, and the recurrence rate to be lower than those reported by others (7, 8). Other investigators have also found ulcers healed by pinch graft treatment to be less prone to recurrence than

those cured by more conventional treatment (9, 10). Moreover, pain relief is very rapidly obtained once an ulcer is covered with skin (9). Even in a longer perspective the quality of life is increased, as every day free from ulceration represents medical and social benefit to the patients (11, 12).

REFERENCES

1. Reverdin JL. Sur la greffe epidermique. Arch Gen Med (Paris) 1872; 19: 276-303.
2. Davis JS. The use of small skin grafts. JAMA 1914; 63: 985-989.
3. Månsson T, Nordin H. Pinch grafting and punch grafting. Workshop; treatment of venous leg ulcers. Läkemedelsverket 1995.
4. Millard LG, Roberts MM, Gatecliffe M. Chronic leg ulcers treated by the pinch graft method. Br J Dermatol 1977; 97: 289-295.
5. Reiter HFH. Ulcus cruris. Cure rate and stability after treatment by skin grafting according to Reverdin. Acta Derm Venereol (Stockh) 1954; 34: 439-445.
6. Ceilley RI, Rinek MA, Zuehlke RL. Pinch grafting for chronic leg ulcers on lower extremities. J Dermatol Surg Oncol 1977; 3: 303-309.
7. Monk BE, Sarkany. Outcome of treatment of venous stasis ulcers. Clin Exp Dermatol 1982; 7: 397-400.
8. Hansson C, Andersson E, Swanbeck G. A follow-up study of leg and foot ulcer patients. Acta Derm Venereol (Stockh) 1987; 67: 496-500.
9. Smith JD, Holder WR, Smith EB. Pinch grafts for cutaneous ulcers. South Med J 1971; 64: 1166-1171.
10. Converse JM. Reconstructive and plastic surgery. Vol. 4. Philadelphia, London: W. B. Saunders Co.; 1964.
11. Kirsner RS, Falanga V. Techniques of split-thickness grafts for lower extremity ulcerations. J Dermatol Surg Oncol 1993; 19: 779-783.
12. Lindholm C, Bjellerup M, Christensen OB, Zederfeldt B. Quality of life in chronic leg ulcer patients. Acta Derm Venereol (Stockh) 1993; 73: 440-443.