Acta Derm Venereol (Stockh) 1997; 77: 144–145

Efficacy of Pinch Grafting in Leg Ulcers of Different Aetiologies

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The prevalence of leg ulcer disease is high and the health care costs are extensive. Effective therapy is essential to minimise the health care costs and suffering on the part of the patient. If possible, first and foremost, therapy should be aimed at correcting the underlying aetiological defect causing the ulcer. After this has been considered, one of the local therapeutic options is skin grafting using small full thickness skin grafts, i.e. pinch grafting. During the period 1991–1993 altogether 145 therapy-resistant leg ulcers were treated with the pinch graft method at the Department of Dermatology, Malmö University Hospital. The healing rate after 3 months was studied in retrospect. An overall healing rate of 36% was found. The healing rate was dependent on aetiological diagnosis, with a healing rate of 22% in venous and 50% in arterial ulcers. The pinch graft method, which may be used on an out-patient basis offers a simple and relatively effective option in the treatment of leg ulcers. It is recommended as first line skin grafting method. As second line skin grafting method split thickness skin graft, with or without ulcer excision, is recommended. ***Key words: skin grafting; venous ulcer; arterial ulcer; hydrostatic ulcer.***

(Accepted August 16, 1996.)

Acta Derm Venereol (Stockh) 1997; 77: 144–145.

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The prevalence of leg ulcers is high. In two Swedish surveys the point prevalence of leg ulcer varied between 0.13 and 0.3% among patients known to the health care system (1, 2). Later studies have shown that the true prevalence may be twice as high because of a high rate of self-treatment (3). Effective therapy is essential to minimise the health care costs and suffering on the part of the patient.

In 1872 Reverdin described a method for obtaining ulcer healing by transplanting small pieces of epidermis, harvested by shaving off the top of a skin fold pinched between the thumb and forefinger (4). The method has become known as the pinch graft technique. A modified version was described by Davis (5). Small full thickness grafts, obtained by lifting skin folds by means of a needle, were used.

The pinch graft method has been practised at the Department of Dermatology in Malmö since 1990. The results of the 145 pinch graft transplantations made during the years 1991–1993 are here analysed in retrospect.

MATERIALS AND METHODS

The present investigation was based on patients treated with the pinch graft method at the Department of Dermatology, Malmö University Hospital, within the period 1991–1993. The indications for pinch graft transplantation during this period have been ulcers resistant to adequate conservative therapy, large ulcers where long time to healing through second intention could be expected and painful ulcers. The patients were identified from the in-patient database.

In all patients a hand-held ultrasound Doppler had been used to examine the arterial circulation by measuring the ankle pressure and the venous circulation by investigating the presence of reflux in v poplitea, v saphena magna and v saphena parva. A probable aetiological diagnosis was then established taking all clinical and Doppler findings into account. From the medical records of the patients' sex, age, ulcer aetiology, duration of a present ulcer, ulcer size (measured with rulers as the two longest diameters at right angles to each other), ankle-brachial index and time to complete healing were obtained. Patients who were treated bilaterally were registered as two cases. Some ulcers were grafted more than once and each time registered as a separate case. The frequency of completely healed ulcers within 3 months after grafting was assessed. In all, 145 leg ulcers were treated with the pinch graft method during this period. Seventy-five per cent of the ulcers were on female patients. The mean age of the patients was 79 years, with a range of 50–95 years and median 81 years.

Transplantation was performed by 4–5 different physicians on hospitalized patients. The ulcer bed was pretreated for a few days to produce fresh granulation tissue, optimal for transplantation. In most cases this was obtained by using wet dressings, soaked with tap-water and changed every 6th hour. The anterior aspect of the thigh was used as donor site. An area approximately the size of the ulcer was anaesthetised with lidocaine 10 mg/ml plus epinephrine. A skin fold was raised by means of a needle and the top was cut off with a scalpel, thus obtaining full thickness grafts 3–5 mm in diameter. The grafts were placed on the ulcer surface 1–2 mm apart, to allow drainage of exudate. The grafted ulcer was covered with vaseline gauze or a silicone dressing (Mepitel®, Mölnlycke Clinical Products, Sweden), covered by saline-impregnated gauze and dry gauze. Finally an elastic bandage was applied to the lower leg. No routine bacterial cultures were taken and systemic antibiotics were not given routinely. The saline-impregnated and dry gauze was changed every 2nd day, while the dressing immediately overlying the grafts was left intact. After 1 week all dressings were changed. During the first week after grafting the patient was restricted to bed rest with the leg elevated. Bathroom visits were permitted. In all patients, compression was applied also after hospitalization. The type of compression and dressing was individualised and always applied by a nurse or nurse's assistant.

RESULTS

The aetiological ulcer diagnoses are shown in Table I. The dominating diagnoses were combined arterial and venous ulcer (33%) and venous ulcer (32%). The present ulcer appeared at a mean time of 20.5 months (range 1–120, median 10 months) before transplantation. Duration of the present ulcer split by aetiological diagnosis is shown in Table I. Venous ulcers with secondary atrophie blanche had a mean duration of 31 months and venous ulcers without atrophie blanche 27 months.

Thirty-six per cent of the ulcers healed within 3 months after pinch grafting (Table I). Twenty-two per cent of the venous ulcers, 50% of the arteriosclerotic and 42% of the combined venous and arteriosclerotic ulcers healed within this period. The highest healing rate was seen in hydrostatic ulcers (83%), i.e. ulcers located between knee and ankle without evidence of arterial or venous insufficiency or small vessel disease background (6).

Since ulcers in some patients were treated more than once without healing, a second analysis was performed including

 ISSN 0001-5555

Table I. *Aetiological classification (139/145), duration in months of present ulcer (141/145) and per cent healing rate at 3 months follow-up (141/145) in 145 leg and foot ulcers treated by pinch grafting*

Diagnosis	N	Duration median (months)	Healed (%)
Total	139	10	36
Ulcus venosum et arteriosclerotic um	44	11	42
Ulcus venosum	44	17	22
Ulcus arteriosclerotic um	3	7	50
Ulcus venosum cum atrophie blanche	11	11	45
Ulcus rheumaticum	7	5	57
Atrophie blanche primaria	4	36.5	0
Ulcus hydrostaticum	6	4.5	83
Other	3	7	67
Angiodermitis necroticans	4	6.5	25
Ulcus diabeticorum arteriosclerotic um	3	4	67
Vasculitis allergica	2	6	0
Pyoderma gangraenosum	1	6	0
Ulcus decubitale	3	24	33

only the first transplantation. The overall healing rate was then 41%. The healing rate for the combined ulcers was 49% and for the venous ulcers 26%.

DISCUSSION

Compared to other studies on pinch grafting this study shows comparably low healing rates. Thus, Reiter in 1954 reported a 56% healing rate in 57 patients with extensive leg ulcers resistant to conservative treatment (7). The low healing rate in the present study compared to Reiter could possibly be explained by the higher age of our patients. Millard et al. reported that patients with partial take or failure of the graft tended to be older than those who had successful grafts (8).

The success rate was also dependent on the aetiology. In our study, venous ulcers had the poorest prognosis, presumably due to long-standing venous insufficiency with subsequent development of lipodermatosclerosis. Franzek et al. showed that severe chronic venous insufficiency may lead to marked local hypoxia, as measured by transcutaneous oxygen tension in the medial ankle region (9), probably giving rise to impaired healing.

Three months was chosen as a suitably distant end point for evaluation of healing for two reasons: firstly the ulcer is incompletely covered with this method and has to be given time for complete healing, secondly it corresponded well to our routines for follow-up.

We have chosen not to report on healing after a longer period, since we consider this to be totally dependent on factors other than the pinch grafting, such as adequate compression treatment, proper venous surgery, arterial surgery and other treatment modalities.

Pinch graft transplantation should never be used as a separate method of treatment. Åkesson & Bjellerup (10) have pointed out the importance of a multitherapeutical approach in the treatment of leg ulcers, including vascular surgery, local treatment and skin grafting.

Bearing in mind the simplicity of the method and the fact that it requires no special equipment, we find it important to include the pinch graft method in the therapeutic armament. After all it achieves a 40% healing rate in therapy resistant ulcers. We recommend pinch grafting as first line method concerning skin transplantation of leg ulcers. As second line method we recommend ulcer excision, including surrounding lipodermatosclerosis if present, and split thickness skin grafting, this method requiring more surgical knowledge and full operating facilities.

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