

DEXTRAN POLYMER PARTICLES (DEBRISAN®) IN THE TREATMENT OF PENILE ULCERS

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Abstract. Dextran polymer particles (dextranomer; Debrisan®) was used in the treatment of 25 patients with non-venereal penile ulcers. In 14 cases the ulcers were caused by herpes infection. 3 patients had dequalinum-induced necrosis and in 8 cases the etiology of the ulceration was unknown. The ulcers healed in most cases during the first week of treatment, and in all cases within 4 weeks. An almost immediate relief of pain was reported by most of the patients.

Key words: Penile ulcers; Treatment; Herpes genitalis; Dequalinum chloride; Dextran polymer particles; Dextranomer

Genital ulcers, especially ulcers of glans penis, pose a frequent problem both for the dermatologist and for the venereologist. The primary task in these cases is to exclude or confirm classical ulcerative venereal diseases like syphilis, chancroid and, more seldom, lymphogranuloma venereum. The incidence of the latter diseases is low in Finland as well as in the other Scandinavian countries. The genital ulcers seen are therefore mostly caused by some other sexually transmitted infection, usually a herpes virus, or are of unknown origin. In a number of cases genital ulcers are caused by local treatment including potent corticosteroids or the use of dequalinum chloride. In a minority of cases the primary cause of the ulcer is probably a trauma.

Whatever the etiology of a non-venereal genital ulcer is, the condition is usually difficult to treat. Systemic antibiotic treatment often has little or no effect and consequently local therapy including antiseptic solutions, powders or creams is mainly preferred, though the results of such treatments are usually poor.

Recently, a very hydrophilic dextran polymer (generic name: dextranomer) has been reported to be highly efficacious in the treatment of burns, in-

fectured wounds and leg ulcers (1, 2, 4). In order to evaluate the effect of dextranomer on non-venereal penile ulcers, a series of patients with ulcers of both known and unknown etiology were studied.

MATERIAL AND METHODS

Twenty-five male patients were studied. They all attended the Out-patient Department for Venereal Diseases, University Central Hospital, Helsinki, during the period of July 1975 to February 1976 for ulcers of the penile mucosa, either on the glans or on the preputium, or both. The mean age of the patients was 26 years, range 18-45 years. The clinical diagnosis before treatment, the duration of the ulceration and the point in time after which healing occurred after starting the treatment are presented in Table I.

Syphilis was excluded in all cases by dark-field examination, repeated testing with the Venereal Diseases Research Laboratory (VDRL) test and, when considered necessary, with the *Treponema pallidum* haemagglutination (TPHA) test.

In cases with even a slight suspicion of chancroid an auto-inoculation test and a microscopical examination for *Haemophilus Ducreyi* of Gram- and Giemsa-stained slides were carried out. No evidence of chancroid was found in any of the cases.

In a few cases a Frei test employing commercial lygranum antigen was performed and the same patients were also tested for an elevated level of serum antibodies against ornithosis antigen. Not one of the patients showed any signs of lymphogranuloma venereum.

In 22 cases herpes simplex virus type 2 (HSV-2) was searched for by direct immunofluorescence (3) and/or culture (3). In all these cases, two serological examinations for the presence of a rising serum titre of antibodies to HSV-2 were performed with a 10-14 day interval. In 14 cases either the HSV-2 was isolated or a rising serological titre indicated an acute HSV-2 infection. Thus, 14 patients were classified as having genital herpes. In all these cases the ulcers were multiple, painful, and in 8 cases there was clearly secondary infection. In 4 cases the ulcerations were larger than 1 cm in diameter; all these patients had used steroid creams.



Fig. 1a. Dequalinum necrosis before treatment.

Three patients had a typical dequalinum chloride-induced toxic necrosis, showing large and deep indolent ulcerations without any signs of granulation (5). The initial condition that had been treated with dequalinum chloride could not be definitely diagnosed in any of the cases, but had probably been either balanitis or genital herpes, according to the patient's history. In all 3 cases the ulcerations had a diameter of at least 1 cm. Earlier local antibiotic treatment had been unsuccessful in all cases.

The etiology of the penile ulcers remained obscure in the third group of 8 patients, in spite of thorough examinations. In all cases the ulcers had a diameter of at least 1 cm. In 3 cases the cause of the ulcers might have been the use of local fluocorticoids for several weeks prior to development of the ulcers. Obviously, the reason for steroid treatment had been balanitis without a specific diagnosis. In no case was there any history of trauma.

Dextranomer (Debrisan®; Pharmacia, Uppsala, Sweden) consists of spherical porous beads with a diameter of 0.1–0.3 mm, in dry form. The beads consist of a three-dimensional net-work of dextran polymers which are highly hydrophilic because of a high content of hydroxyl groups. When the beads come into contact with fluid, they absorb water and swell until saturated. One gram of dry beads holds about 4 ml of water, when saturated. The dextranomer beads affect the ulceration by sucking the secretion into the small interspaces between the beads by capillary action (2). Low molecular substances and fluid are absorbed by the beads, whereas high molecular weight substances (mol. wt >5000) remain in the interspaces. As long as the beads remain unsaturated a continuing removal of secretion from the wound occurs. There is little or no change in pH or ionic strength. Thus, a chromatographic separation of the molecules and substances occurs. Under these conditions no crust is formed on the wound, since fibrinogen is continuously carried away from its surface. In the layer of dextranomer beads a high content of fibrinogen–fibrin split products can be found, but no coagulable fibrinogen, thus indicating a high fibrinolytic activity in the wound secretion (2).

All 25 patients were treated in the same way. Dry dextranomer beads were applied to the ulcers so that the cavity was filled twice daily. Before every new applica-



Fig. 1b. Complete epithelialization after 3 weeks of treatment. Note reappearance of condylomata acuminata which, according to the case history, had been present at the same site 5–6 months before the appearance of the necrosis.

tion the previous dextranomer was removed by rinsing water. No other treatment was allowed. All patients were re-examined weekly until the ulcers showed complete epithelialization.

RESULTS

In the group of 14 patients with proven genital herpes the lesions healed more rapidly than in the other two groups (Table I). The 6 patients without signs of secondary infection were all completely cured 3–4 days after the treatment had started. In the 8 remaining cases all ulcers were clean and granulating after one week, 6 patients were cured 2 weeks and the 2 remaining patients 3 weeks after the treatment had started.

The 3 patients with dequalinum chloride ulcerations had had their lesions for 8–16 weeks, when first seen. After one week of treatment a clean sore with granulation was observed in all 3 cases, and

Table I. Clinical data of the 25 patients treated

	Diagnosis		
	Herpes genitalis	Dequalinum necrosis	Non-specific ulcers
Total	14	3	8
Duration of lesions before treatment (weeks)	2–6	8–16	2–7
Time of healing (weeks)	1–3	3–4	2–4

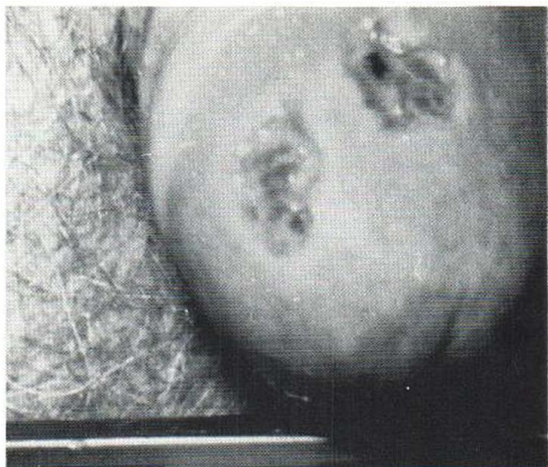


Fig. 2a. Non-specific ulcers before treatment.



Fig. 2b. Completely cured after 2 weeks of treatment.

2 patients showed complete healing after 3 weeks (Fig. 1a, b). In the third case the ulceration was healed after 4 weeks. In all 3 cases a defect of the ulcerated area remained.

In the 8 cases without a specific diagnosis the ulceration had lasted for 2–7 weeks. After one week of treatment the ulcers were clean and granulating in all cases. Two patients were cured with complete epithelialization after 2 weeks (Fig. 2a, b) and the 6 remaining patients after 3–4 weeks of treatment.

No side effects were observed in any of the 25 patients treated. According to the patients the most striking change after the start of treatment was an almost immediate relief of pain.

DISCUSSION

The use of dextranomer beads in the treatment of penile ulcers proved to be very convenient and efficient even in very therapy-resistant cases. No irritation of the mucosa was observed and the strikingly rapid relief of pain was encouraging. When skin ulcers are treated with dextranomer, occlusion has been suggested (2) which makes the treatment somewhat more complicated. Occlusion is unnecessary, however, when treating penile ulcers, since a natural occlusion is formed by the preputium. The cleaning of the ulcers was very rapid, which was obviously due to the continuous removal of fibrinogen. The subsequent granular tissue formation was also very rapid.

The weakness of the present study is that it is an open trial without controls. However, strictly comparable cases are difficult to find and the conventional methods for treatment are unsatisfactory. It may therefore be concluded that the overall good results of the treatment in the present series show that dextranomer is highly effective in the treatment of penile ulcers.

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