INTRALESIONAL TRIAMCINOLONE IN THE TREATMENT OF CYSTIC ACNE

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The treatment of severe forms of cystic acne and certain allied conditions is still far from satisfactory. Even with antibiotics, progress tends to be slow, and unsightly scarring is a common ultimate sequel. This preliminary report is published because of the very promising results in the treatment of such cases, with intralesional corticosteroids administered by the Dermo-jet apparatus,* which permits a small measured quantity of a solution of fine suspension to be driven at high pressure through a small capillary opening, thus enabling the jet of fluid to penetrate the skin.

There is, undoubtedly, a close relationship between cystic acne, keloidal folliculitis of the back of the neck, and the so-called follicular occlusion triad, acne conglobata, hidradenitis suppurativa and dissecting cellulitis of the scalp, alternatively known as perifolliculitis abscedens et suffodiens. The main feature of these diseases is the very marked inflammatory and suppurative reaction in localized areas and their unsatisfactory reaction to treatment.

Treatment

Treatment is usually along the following lines:

1. *Broad-spectrum antibiotics* which have a suppressive effect to a varying degree, but which rarely, if ever, bring about an outright cure of the disease, and which require to be given over a long period.
2. *X-ray therapy*, which may have some effect usually of a temporary nature, but has now fallen out of favour with most dermatologists.
3. *Operation*, which, particularly in the follicular occlusion triad cases, may have to be rather drastic, usually in the form of removal of affected areas of skin, followed by grafting.

None of these methods would appear to be the ideal treatment for this syndrome.

AETIOLOGY

Strauss and Kligman[1] stressed the significance of the well-known hyperkeratotic obstructive tendency round the mouth of the follicle and also stated that bacteria present in the occluded follicle may, in the environment of sebaceous material, produce an acute inflammatory reaction which weakens the follicular lining membrane, leading in some cases to rupture and the liberation of keratin and lipoids into the surrounding dermis. This provokes an acute irritant inflammatory reaction which may cause liquefaction necrosis and the formation of cystic collections of pus; such an event is, obviously, more likely to develop in patients who subject the lesions to trauma in the form of picking at spots or squeezing pimples. The frequency of finding that this pus is sterile on culture, and the indifferent results after local instillation of antibiotics into the lesions, appear to support this.

*The Dermo-jet apparatus was invented by Dr. Krantz of France, and is now manufactured by F. H. Wright Dental Co. (Ltd.), Industrial Estate, Kingsway West, Dundee, Scotland.

Strauss and Kligman further describe the 2 types of comedones as (1) *blackheads*, which are open comedones with a widely dilated mouth, and (2) *whiteheads*, which are closed comedones having only a microscopic opening which tends to lead to the retention of the follicular contents; these latter they describe as the time-bomb which may explode to set off the inflammatory process. Following this explosion, lipoids and keratin are released into the surrounding dermis, producing an acute foreign-body reaction. *Corynebacterium acnes* may be found in these lesions.

Causes of Inflammation

The 3 main aetiological factors in this inflammation are:

1. Sebum which, on intradermal injection as a 1% solution, causes an acute reaction which is diminished when the short-chain fatty acids are excluded;
2. Keratin which, on injection alone, incites a foreign-body type of reaction; and
3. *C. acnes* which, when injected into keratinous cysts results in their rupture with massive inflammatory reaction.

Lever,[2] in discussing a case of acne conglobata and hidradenitis suppurativa at a clinical meeting, stressed that our views on these two diseases need reviewing. He felt that they should no longer be regarded primarily as cases of bacterial infection, but basically as diseases of tissue necrosis in the first instance, which can be controlled or inhibited by corticosteroids and he suggested that some form of local auto-immunological reaction may be taking place. The case under discussion showed very severe hidradenitis associated with acne conglobata. Antibiotics were unable to control the inflammatory reaction sufficiently to enable surgeons to excise and graft the affected areas. X-ray therapy had had no appreciable effect and it was only by administering systemic corticosteroids that surgical treatment could be carried out.

REPORTS ON STEROID THERAPY

Mitchell-Heggs,[3] in discussing the treatment of acne, dismissed corticosteroids in a few lines, saying that since these hormones frequently provoke hirsutism and acne, they could have no place in the treatment of the condition. Baer and Witten[4] mention briefly that they have used intralesional steroids in cystic acne, but make no further comment.

Andrews[5] stated that, in addition to the mechanical obstruction in the follicle, there is a marked non-specific inflammatory reaction in these cases. He also stated that cystic acne lesions are often found to be sterile on culture and histologically show a foreign-body granulomatous-type reaction. He suggested the use of systemic steroids in selected cases but stressed, naturally, the difficulty of withdrawing the steroids without provoking a relapse. In spite of the spate of literature on intralesional steroid therapy, there are very few direct references to intralesional treatment of acne with corticosteroids. Rebello[6] reported 9 cases of nodular and cystic acne which showed a very marked improvement after intralesional steroids.

METHODS AND MATERIALS

It was decided, for these clinical trials, to use the Dermo-jet apparatus for administering the intralesional corticosteroids, since it appeared to have certain definite advantages, viz.:

1. The injection is virtually painless and there is no needle which would require to be changed for each injection.
2. A small quantity of the steroid suspension is blown through the skin to a depth of 1 - 2 mm. This was sufficiently deep in every case except one, a very chronic case, to penetrate the sac of the cystic lesion.

Technique

The preparation selected for use was 10 mg./ml. of triamcinolone acetonide, which was found to be a sufficiently fine suspension to pass through the fine jet of the apparatus. The dosage delivered per injection was found to be approximately 0·03 ml., which meant that a patient receiving 34 injections—the highest number given on any one occasion—received at the most just over 10 mg. of triamcinolone. The technique used was to apply the Dermo-jet directly in contact with the skin overlying a lesion so as to secure maximum penetration. A small cyst or nodule up to 2 - 3 mm. in diameter received 1 injection, one of 7 - 10 mm. in diameter 2 - 3 injections, and correspondingly larger lesions received a larger number of injections. The cystic lesion present in the patient with hidradenitis suppurativa, which had a diameter of 2 cm., received 5 iniections. Tunnels of acne conglobata or dissecting cellulitis of the scalp were given 1 injection about every 5 mm. along the tunnel.

Some anxiety was felt with regard to the possibility of systemic absorption of steroids in cases with multiple lesions requiring treatment, but reports suggested these fears could be discounted and in fact no evidence of systemic action of steroids was observed in this series. Handel[7] reported in 1962 that he had given 380 mg. of triamcinolone intralesionally over a period of 8 weeks, without being able to find any detectable evidence of systemic effect, and Schiller[8] reported giving a total dosage of 350 mg. intralesionally, and up to 150 mg. at one single treatment. He stated that he only noticed 'slight transient moon-face in some of his patients'.

Cases were photographed in colour before treatment, 48 hours later, and 7 days after treatment. Some lesions were also cultured—most of these resulted in the growth of *Staph. pyogenes* but a few were sterile. The sterility or otherwise of these lesions did not in any way affect the therapeutic results and lesions are not cultured as a routine procedure. Initially, as a precaution, patients were given systemic antibiotics during the intralesional steroid therapy, but after the first few cases this was stopped without in any way affecting the results. One patient in this present series was a diabetic, stabilized on 90 units of insulin daily. At his second treatment 25 injections did not in any way affect the control of his diabetes.

Previous Treatment

All the patients selected for this trial had had extensive treatment previously which included long courses of systemic antibiotics or long-acting sulphonamides, X-ray therapy and, in one case, dermabrasion on 2 separate occasions. A curious observation, which is difficult to explain, was that while in some of the earliest cases a conventional syringe and needle had been used, results in these cases compared unfavourably with those in which the Dermo-jet was later used. This might possibly be due to the fact that it is difficult, with a normal syringe, to give a dose such as 0·03 ml., which was what the small lesions received. This observation was confirmed in one patient with multiple lesions who returned to her home in a remote country area and later developed some fresh lesions: further intralesional injections by syringe, given by her own doctor, did not have the same effect as her previous treatment with the Dermo-jet.

In cystic acneiform lesions it must be remembered that there is a tendency, as Strauss and Kligman pointed out, for encapsulation of inflammatory masses followed by fibrous proliferation which is often intense and which can lead to the formation of hypertrophic or keloidal scars on which the intralesional steroids cannot be expected to have much effect. It is important, therefore, that these patients be treated as early as possible in the acute active suppurative stage.

OBSERVATIONS

A total number of 27 patients have been treated and observed; these included 1 patient with hidradenitis suppurativa, 2 with large suppurative cysts over the back of the neck, 10 localized cystic lesions, 7 cases of nodular acne with some degree of pustulation, 6 generalized pustular and cystic cases and 1 mild case of perifolliculitis abscedens et suffodiens, present for over 20 years. The results of treatment in these cases are shown in Table I and Figs. 1 - 6 illustrate the results of treatment in some of the cases.

Results in every case were assessed personally by the author and the patient's impressions were also recorded. In many cases it was found that the patient's assessment was the higher, and the unanimous view expressed by the patients was that this method of treatment was by far the most effective they had received, particularly with regard to the rapidity of healing and good cosmetic result. The

TABLE I. SUMMARY OF CASES TREATED WITH TRIAMCINOLONE

Condition	*No. of cases*	*Average no. of visits for treatments*	*Average no. of injections per case*	*Results of treatment*			*Remarks*
				Excellent	*Good*	*Satisfactory*	
Generalized pustular and cystic acne	6	1·8	30	3	2	1	
Nodular acneiform lesions (with pustular element)	7	1·5	9	5	2	—	2 cases reported possible relapse in treated (large) lesions. Possibly due to inadequate dosage in early cases
Localized cystic lesions on face	10	1·7	14	7	3	—	
Large suppurative cystic lesions of back of neck	2	2	10	2	—	—	1 patient relapsed after 4 months. These may have been fresh lesions
Hidradenitis suppurativa	1	1	5	1	—	—	Cleared within 24 hours. No suppurative discharge. Infinitely quicker and better result than with antibiotics
Perifolliculitis abscedens et suffodiens	1	1	10	1	—	—	
Total	27			19	7	1	

Excellent: Treated lesions cleared within 48 hours.
Good: Lesions showed marked improvement within 1 week.
Satisfactory: Treated lesions showed some improvement, better than any previous treatment.

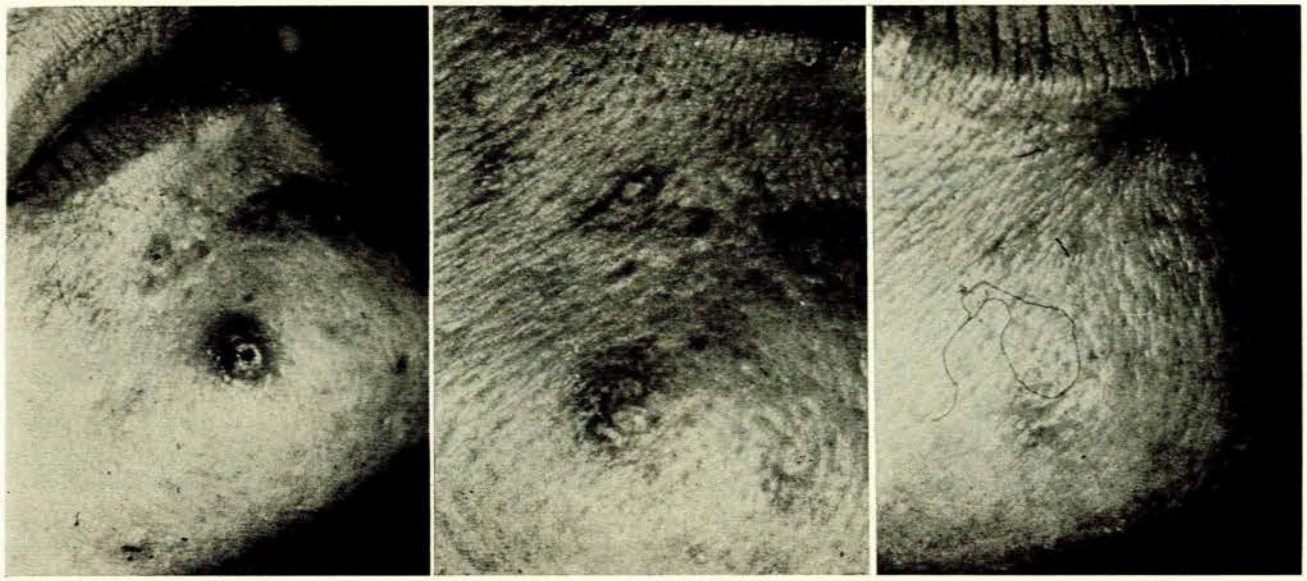

Fig. 1. Pustular acne. *Left.* Before treatment. *Centre.* 2 days after treatment. *Right.* 7 days after treatment.

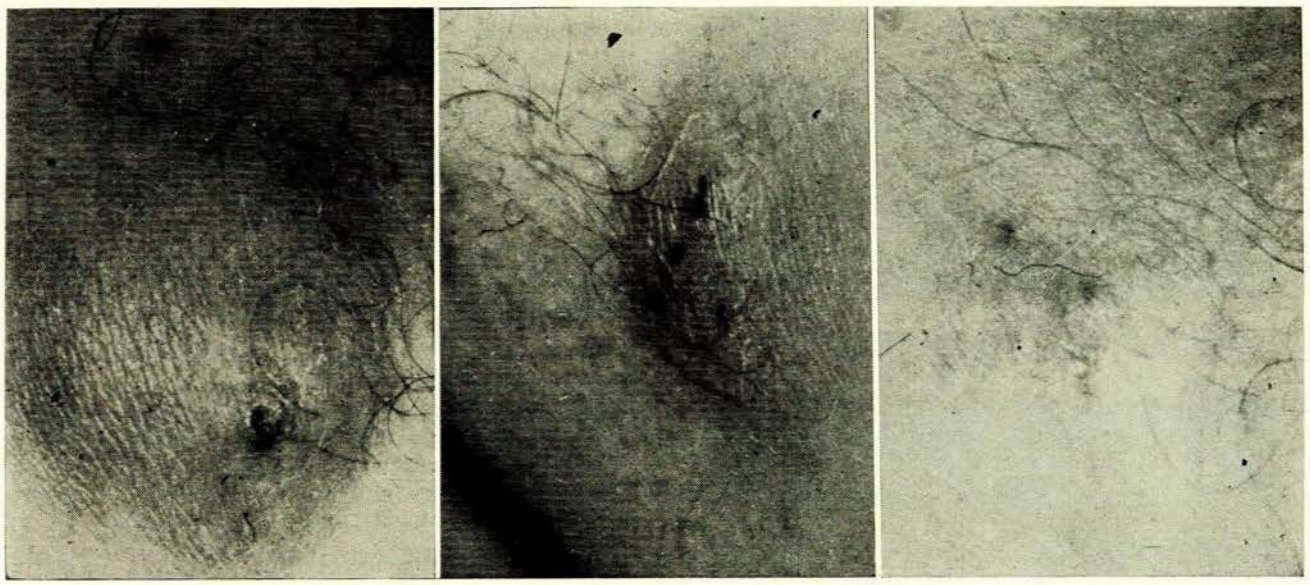

Fig. 2. Hidradenitis suppurativa. *Left.* Before treatment. *Centre.* 2 days after treatment. *Right.* 7 days after treatment.

most striking effect was on the morale of the patients, many of whom had been very defeatist in their outlook at the start of this treatment.

COMMENT

The outstanding feature in all these cases has been the almost dramatic resolution of lesions within 24 - 48 hours, without leaving any scar in the more acute lesions where there had not been time for much fibrous tissue formation.

The patient with hidradenitis suppurativa had previously had about 8 lesions which had developed over a period of 18 months. Administration of suitable antibiotics after culture and sensitivity tests appeared, in the past, to have little effect on the lesions which took about 4 weeks to clear with a period of continuous suppurative discharge; within 24 hours of the intralesional steroid injections, the cystic lesion was no longer fluctuant and there was no discharge, and within 7 days it was difficult to see or feel where the lesion had been.

The patient with perifolliculitis abscedens et suffodiens was a Naval Warrant Officer who gave a 20-year history of recurrent cystic and tunnelling lesions of the scalp with almost continuous suppurative and malodorous discharge. Extensive surgery and repeated courses of antibiotics had had little effect on his condition, but within 2 days of 10 intralesional injections all treated lesions were dry and only the fibrous and nodular scarring of old lesions was visible.

Force of the Jet

In injecting cystic lesions, the force of the jet had an incisive effect and the contents of the lesions tended to drain out. Undoubtedly some of the steroid would be lost in this way, indicating the very small quantity of steroid required to cause resolution of the inflammation. At first it was considered that this drainage of the lesion might possibly be responsible for the rapid resolution, but treatment of cystic lesions with sterile saline in the Dermo-jet, or by scalpel incision, was not followed by the same rapid healing or such good cosmetic results. No blind controls have as yet been carried out but most of the patients treated were depressed, disillusioned and defeatist and it would appear to be unlikely that any psychosomatic factors could have influenced the results.

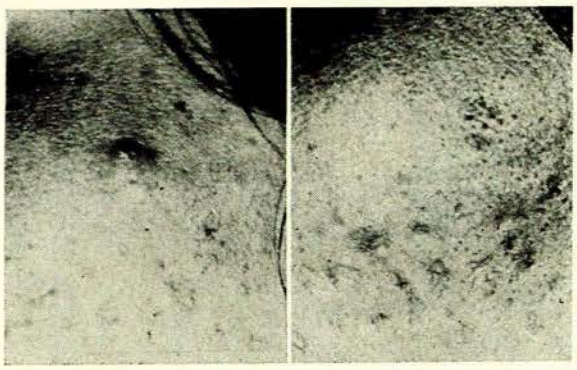

Fig. 3. Pustular acne. *Left.* Before treatment. *Right.* 2 days after treatment.

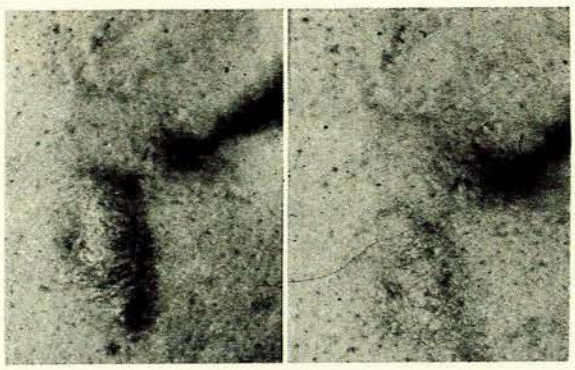

Fig. 4. Cystic acne. *Left.* Before treatment. *Right.* 2 days after treatment.

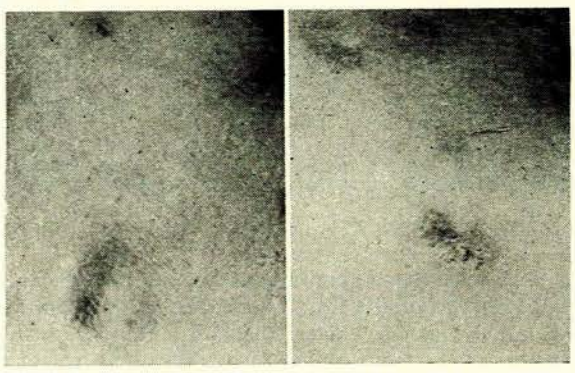

Fig. 5. Cystic acne. *Left.* Before treatment. *Right.* 2 days after treatment.

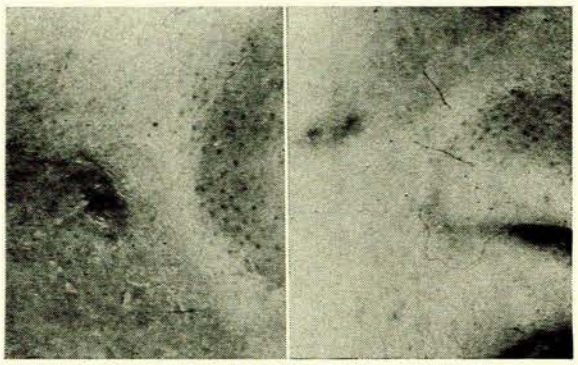

Fig. 6. Cystic acne. *Left.* Before treatment. *Right.* 2 days after treatment.

Two patients developed a definite recurrence in a previously treated lesion, possibly due to under-dosage of large lesions in the early stages of the investigation. Further treatment led to complete resolution, and no relapse has been observed in these 2 patients over a 5-month period. All cases have been observed over a minimum period of 6 months, and in no other cases have treated lesions recurred. One patient with large cystic lesions on the back of the neck reported a recurrence after 4 months but these appeared to be fresh lesions in different sites.

The most marked effect, apart from the disappearance of the individual treated lesions, was on the general morale of the patients, as a result of the rapid disappearance of unsightly and painful lesions.

It should be stressed that this method of treatment should be used in combination with the usual methods of controlling acne such as long-term tetracycline or long-action sulphonamide therapy. Essentially local treatment as described in this paper has obvious limitations, but it is a great help in suppressing the more unsightly manifestations of severe acne and would appear to have a very definite place in the handling of selected cases.

Advantages of Treatment

The main advantages of the method outlined above are:

1. The rapid disappearance of treated lesions.
2. The great economy to the patient as compared with other methods of treatment.
3. The apparent absence of any side-effects or possible complications of treatment, as compared with systemic corticosteroid therapy.
4. The simplicity of the technique and the quickness with which multiple lesions can be treated.
5. The knowledge to the patient that any new cystic lesions that may develop can be treated with the prospect of rapid resolution of the lesion and a good cosmetic end result.

SUMMARY

The aetiology of cystic acne and the follicular occlusion triad is discussed and the relatively minor part that infection plays is stressed.

The results of treating 27 selected cases with intralesional triamcinolone acetonide suspension, using the Dermo-jet apparatus, are reported. These were found to be more satisfactory than any other previous treatment and in many cases the results were dramatic. This is the first record in the literature of corticosteroids being administered by this method, which appears to have many advantages over conventional injection by syringe and needle.

ADDENDUM

Since the paper on which this article is based was read at the 44th Medical Congress (M.A.S.A.) in July 1963, more than 100 further cases have been treated along these lines. These have been mostly cystic acneiform lesions but some relatively solid nodular lesions have also been included. The results have been very similar to those described in the first series. The best results are found in patients with acute cystic and inflammatory lesions in the early stages; in the rather firmer nodular lesions where there has been time for marked fibrous proliferation to develop, results are not so spectacular but have still been very satisfactory.

Preliminary reports from dermatologists elsewhere who, since this paper was read, have adopted this method are equally encouraging and Pillsbury,[9] who is carrying out a full-scale clinical controlled trial in his department at Philadelphia, reports that results so far are very satisfactory and he has not yet seen a complete failure. He adds that results in 3 or 4 days in many instances have been quite spectacular.

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