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Technique to Improve the Rate of Healing of Incised Abscesses

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Summary

In a comparative investigation incised skin abscesses were treated by either introducing sterile fusidic acid gel into the cavity on one occasion only or applying daily superficial dressings impregnated with sodium fusidate ointment. In comparison with the dressing group, the intracavity use of fusidic acid gel reduced the mean healing time of incised abscesses by approximately one-half. When abscesses were analysed according to site and size, the reduction in mean healing time was equally striking. No hypersensitivity or irritation to fusidic acid or its sodium salt applied by either method was observed.

The procedure of introducing fusidic acid gel into an incised abscess cavity is a promising alternative to superficial antibiotic dressings or wicks in the treatment of incised abscesses.

Introduction

It is customary in the casualty department of the Public Dispensary and Hospital, Leeds, to treat soft-tissue abscesses by incision and drainage under antibiotic cover. Both systemic and topical antibiotics have been given on the assumption that even careful curettage may fail to evacuate isolated pockets of infection, and these must be eradicated before healing can take place.

However, while systemic antibiotics are indicated when there is evidence of lymphangitis, lymphadenitis, and fever, recent investigations cast doubt on their value in localized infections. Rutherford *et al.* (1970) failed to show any significant difference in the mean healing times of localized skin infections treated by surgery with a course of oral cloxacillin compared with a group treated by surgery alone. They therefore concluded that cloxacillin was unable to reduce healing times of septic lesions by an amount likely to be of clinical value in treating groups of localized skin infections. Price *et al.* (1968) showed no difference in efficacy between penicillin V, phenethicillin, and lincomycin, despite the observation that half the staphylococci isolated were resistant to penicillin. They suggested two possible explanations: (1) the organisms concerned were only weak producers of penicillinase and therefore had little inhibitory effect on penicillin, and (2) the reason for the equivocal results may be that

systemic antibiotics do not materially affect the natural course of superficial staphylococcal infections.

Topical antibiotic therapy has not found particular favour as an alternative treatment, partly because of the complication of skin sensitization. Among the most widely used topical antibiotics are neomycin and framycetin, which are particularly prone to this disadvantage. Hjorth and Thomsen (1967) reported that as many as 10% of all patients with dermatitis seen during 1964 at the Finsen Institute had an allergic contact sensitivity to these substances.

Another practical problem is that of ensuring intimate contact between local antibiotic and infecting organisms. If an antibiotic dressing is merely applied superficially over an incised abscess it is difficult for it to reach the crevices of a large abscess cavity. The use of antibiotic-impregnated wicks is a possible solution but these may delay healing and their removal causes great pain.

It was decided to investigate the value of injecting an antibiotic deep into the abscess cavity. Previous experience had shown that topical sodium fusidate was clinically effective and caused extremely few adverse reactions. A suitable gel base was developed which was sufficiently viscous to maintain prolonged contact with the lesion. An investigation was designed to compare the healing times of incised abscesses treated either by injecting the fusidic acid gel into the cavity, or by applying a superficial dressing impregnated with sodium fusidate ointment as control.

Method

All abscesses were incised and carefully curetted. On Mondays, Wednesdays, and Fridays the cavities were injected with fusidic acid gel from a sterile, disposable, single-dose injector. This had an elongated, flexible nozzle allowing application deep into the abscess cavity. A dry dressing was then applied. On Tuesdays, Thursdays, and at weekends the abscesses were incised, curetted, and treated simply with a superficial dressing impregnated with sodium fusidate ointment. All patients were asked to return daily. In those treated with fusidic acid gel the dry dressing was replaced; no further injection of fusidic acid gel was made. In the other cases the sodium fusidate ointment dressing was replaced at each attendance. Healing time was measured from the date of incision to the formation of a dry scab.

Some patients had already received systemic antibiotics from their own doctors (mainly an oral penicillin or tetracycline). Others were given short courses of antibiotics by us when there was evidence of infection spread (mainly injections of procaine penicillin). Systemic antibiotics were given to 54.2% of patients treated with fusidic acid gel and to 46.6% of patients treated with

the sodium fusidate ointment dressing. Details of systemic antibiotic therapy is given in Table I.

TABLE I—Analysis of Systemic Antibiotics Given to Patients in each Group

	Fusidic Acid Gel (54.2*)	Sodium Fusidate Ointment (46.6*)
Receiving penicillin alone	61%	67%
Receiving tetracycline alone	32%	26%
Receiving penicillin + tetracycline ..	7%	7%

*These figures represent percentage of patients in either group given systemic antibiotics. Testing by proportions indicates no significant difference.

Immediately after incision a swab was taken and sent for bacteriological examination. Other details recorded were the approximate diameter of the abscess before incision, the history and site of the abscess, the duration of symptoms, any adverse reaction observed, and the comments of the patients. Swabs were also taken from patients not included in the trial but who were attending the septic clinic during the course of the trial. Altogether, 1,330 swabs were analysed.

Results

This investigation took place between October 1969 and December 1970. Of 97 patients treated by introducing fusidic acid gel into the abscess cavity 10 failed to return for follow-up, and of the 84 patients treated with the dressing 13 failed to return. All defaulted during the final stages of treatment, and although their lesions had almost healed when last seen their results have been excluded.

The mean healing times of the 87 patients treated with fusidic acid gel and the 71 treated with the dressing are listed in Table II. Also shown are the mean healing times of abscesses according to their site and size. There was a striking equality in the number of patients in corresponding subgroups. Even more striking was the reduction in healing time brought about by using fusidic acid gel in the abscess cavity, whether the abscesses were analysed as a whole or according to the subgroups. Healing times were reduced by about one-half.

TABLE II—Healing Rate of Incised Abscesses

	No. of Patients		Mean Healing Times (Days)	
	Fusidic Acid Gel	Sodium Fusidate Ointment Dressing	Fusidic Acid Gel	Sodium Fusidate Ointment Dressing
All cases	87	71	4.8	9.9†
Axillary abscess 1-2 in (2.5-5 cm) diameter	14	10	3.6	5.8*
Infected sebaceous cysts 1.5 in (4 cm) diameter	8	8	3.6	9.0†
Abscess 2 in (5 cm) diameter and over	15	16	5.7	11.2†
Other abscesses	50	37	5.0	10.4

Significance of the decreased healing times with fusidate gel ranged from $P = 0.01^*$ to $P = 0.001†$.

TABLE III—Analysis of 1,330 Swabs Taken from Septic Cases seen between October 1969 and December 1970. Including 208 with No Growth

Total No. of organisms	1,153*
<i>Staph. aureus</i> isolated	942 (82%)
Coliforms isolated	92 (8%)
Other organisms, including mainly streptococci and <i>Staph. albus</i> ..	119 (10%)

*Organisms were occasionally found in mixed infection.

Staphylococci resistant† to:	
Penicillin/Ampicillin	462 (49%)
Tetracycline	25 (2.6%)
Novobiocin	2 (0.21%)
Fusidic acid	4 (0.42%)
Cephaloridine	6 (0.63%)
Lincomycin	5 (0.53%)
Cloxacillin	3 (0.32%)

†Many isolates were resistant to more than one antibiotic.

All abscesses in both groups healed without the need to change treatment. No evidence of local or generalized reaction to sodium fusidate applied by either method was observed.

Analysis of swabs taken from patients in the trial showed that *Staphylococcus aureus* accounted for 81% of all the organisms isolated. When these data were included in the larger survey (details given in Table III) the percentage of staphylococcal isolates remained approximately the same (82%). The data also showed that 49% of staphylococci were resistant to benzylpenicillin and ampicillin (see Table III).

Discussion

The use of the days of the week as a method of allocating patients to the two treatment groups is not ideal, since it could be argued that patients attending on Saturday might have delayed seeking medical attention. However, considering the large number of patients involved (181), allocation by using random numbers would have imposed an intolerable work burden on the department. The method of allocation was considered sufficiently random to allow for variation of lesions. Study of the two groups showed no significant difference in age or sex of patients; the site, size, or type of abscess; or the number of patients defaulting. Testing by proportions indicated no significant difference in the numbers of patients receiving systemic antibiotics in the two groups. A comparison of the mean healing times for each treatment group is therefore valid.

There was a striking reduction in the mean healing time of the group treated by introducing fusidic acid gel into the abscess cavity. Comparison of the two groups as a whole showed that this procedure reduced the healing time by about one-half; much the same reduction was seen when abscesses were analysed according to site and size.

The pronounced influence of sodium fusidate on wound healing has already been recorded. Taylor and Bloor (1962) treated eight staphylococcal wound infections with systemic sodium fusidate and emphasized that healing was very rapid. Because of this, they suggested that sodium fusidate might have some healing properties in addition to its antibacterial effect. The influence of sodium fusidate on the healing of sterile wounds was investigated by Cowan (1965) and by Calnan and Fry (1962), but the results were inconclusive. However, Meyer Rohn (1964) reported that in the treatment of staphylococcal infected leg ulcers topical sodium fusidate showed an enhanced effect on the formation of granulation tissue.

In a previous investigation (Ritchie, 1966) the mean healing times were compared in two groups of patients with localized skin sepsis. A mean healing time of 7.9 days was recorded in the group of 1,010 patients treated with sodium fusidate ointment. In contrast, a mean healing time of 10.5 days was recorded in the 836 patients treated with simple dressings or topical antibiotics such as neomycin and framycetin. This 25% reduction in mean healing time with sodium fusidate ointment was statistically significant.

Knight *et al.* (1969) showed experimentally that both fusidic acid and sodium fusidate are absorbed through intact skin. They also observed that sodium fusidate ointment applied to boils and superficial folliculitis led to the resolution of the lesions without the administration of systemic antibiotics. More recently, Sneddon (1970) reported that using sodium fusidate ointment on large boils and carbuncles resulted in a marked reduction in inflammation and pain. She emphasized that there seemed to be much less slough formation and subsequently quicker healing. Furthermore, she suggested that when lesions are already discharging the use of sodium fusidate ointment can also lead to more rapid healing.

It is possible that another antibiotic prepared in a base suitable for cavity injection would have also produced results similar to those of fusidic acid gel. It was our original intention to compare fusidic acid gel with another antibiotic on a double-blind basis, but the choice of this second antibiotic was limited. Most topical

antibiotics carry a high risk of causing allergic reactions, and this is particularly true of penicillin and the aminoglycoside antibiotics, neomycin and framycetin. Moreover, the incidence of staphylococcal resistance to penicillin and neomycin seems to be increasing. We eventually decided to use tetracycline, but for pharmaceutical reasons a suitable formulation was difficult to prepare.

Topical sodium fusidate does not seem to have these disadvantages. In the present trial sodium fusidate applied by either method was free of adverse reactions. This is also in accord with previous reports which recorded the use of sodium fusidate ointment and impregnated paraffin gauze sodium fusidate in 1,010 and 250 patients respectively (Ritchie, 1966, 1968). Topical sodium fusidate has been used in this department during the past seven years in over 10,000 cases without adverse effect. Sjøbye (1966) treated 427 dermatological infections with sodium fusidate ointment but encountered no instances of hypersensitivity.

Of the total of 1,330 swabs examined, only on four occasions were staphylococci shown to be resistant to sodium fusidate. This incidence of resistance is similar to that recorded for cephaloridine, cloxacillin, lincomycin, and novobiocin. None of these patients was included in the present trial.

Further analysis of the 1,330 swabs showed that *Staph. aureus* accounted for 82% of all organisms isolated. This is similar to the 80% incidence mentioned by Sneddon (1970). However, almost 50% of our staphylococci were resistant to penicillin and ampicillin, which is almost the same as the incidence of penicillin resistances found at St. Bartholomew's Hospital by Price *et al.* (1968).

This relatively high incidence of resistance to penicillin makes

the routine use of systemic antibiotics such as Triplopen and procaine penicillin of doubtful value. Cloxacillin is a more logical choice but should probably be used only when there is evidence of infection spread. According to Rutherford *et al.* (1970), cloxacillin is of doubtful value in the treatment of localized, superficial lesions.

The procedure of introducing fusidic acid gel into an incised abscess cavity is clearly a promising alternative to superficial antibiotic dressings or wicks in the treatment of incised abscesses.

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Survey of School Meals

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Summary

A Survey of 48 schools in South-east England showed that the protein and energy contents of the school meals were well below the standards set by the Department of Health. It was found that 7.4% of the children did not have breakfast. One school provided meals twice the average size, and the food was eaten. About 10% of the food offered was wasted.

Introduction

A survey of school meals was undertaken between November 1970 and May 1971 in South-east England in order to measure the amount of food consumed and to determine the nutrient intake by calculation from food-composition tables.

Methods

SELECTION

The amount of food consumed depends to a great extent on the menu and method of preparation, age and weight of the individual, and day-to-day variation in appetite. It was hoped to include all these variables by visiting several schools for children of each age group on a single occasion and selecting 20 meals at random in each, irrespective of the number of meals served and the ages of the children. In all, 48 schools were visited—8 infant, 18 infant-and-junior, 12 junior, and 10 senior. Schools were selected for geographical convenience and representative types, and visits were made on all days of the week.

Because of practical difficulties the number of meals weighed reached 20 in only half the schools, in the others the number varied between 9 and 19. Altogether 772 meals were examined. Most schools served between 200 and 300 meals each day.

Children were selected at random, roughly spaced throughout the serving period. Where there was more than one lunch period the sample of 20 was made up with some meals from each period. When there was a choice of dishes a number of each type was included. In each instance there was a main dish and a dessert.

PROCEDURE

A team of four investigators visited each school. One selected the child whose food was to be examined and brought him and

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