- Furstenberg, A. C., Lashmet, F. H., and Lathrop, F. (1934). *Ann. Otol., etc., St. Louis*, **43**, 1035.
 Haggie, M. H. K. (1949). M.D. Thesis, University of Cambridge.
 Hallpike, C. S., and Cairns, H. (1938). *Proc. roy. Soc. Med.*, **31**, 1317.
 Kodicek, J., Taylor, L. R. S., and Bateman, G. H. (1950). *Ibid.*, **43**, 283.
 Ménière, P. (1861a). *Gaz. méd. Paris*, **16**, 597.
 — (1861b). *Bull. Acad. Méd. Paris*, **26**, 241.
 Mygind, S. H. (1924). Quoted by Dederding (1929).
 Rainey, J. J. (1943). *J. Amer. med. Ass.*, **122**, 850.
 — (1945). *N.Y. St. J. Med.*, **45**, 1753.
 Shelden, C. H., and Horton, B. T. (1940). *Proc. Mayo Clin.*, **15**, 17.
 Williams, H. L. (1944). *Ann. Otol., etc., St. Louis*, **53**, 397.
 — (1947). *Ibid.*, **56**, 614.
 Wright, A. J. (1937). *Proc. roy. Soc. Med.*, **31**, 87.
 — (1946). *Ibid.*, **39**, 809.

THE ERYSIPELOID OF ROSENBAACH

BY

J. E. L. PRICE, M.B., F.R.C.S.

Late Surgical Registrar, King's College Hospital

AND

W. E. J. BENNETT, M.B., F.R.C.S.

Surgical Registrar, King's College Hospital

Erysipeloid infections of the hand are generally considered to be uncommon. This impression is supported by the scant references to the condition in many of the popular textbooks and by many of the recent papers dealing with the clinical aspects of the infection. However, it has also been suggested that this apparent rarity is due to frequent misdiagnosis (McNeill Love, 1949). Casualty officers working near meat and fish markets, slaughterhouses, and hotel districts are quite familiar with the disease and regard it as being by no means uncommon. In most of the reported cases the diagnosis has depended solely on clinical grounds, and it has been argued that, as the clinical picture is so typical, biopsy with subsequent isolation of the causative organism is neither necessary nor justifiable (Goodwin, 1950).

Biopsies were performed in a number of the cases reported in this communication, and the results of this bacteriological investigation will be detailed later.

Clinical Features

The clinical picture is a very typical one and was uniform in all our cases. The original description was published by Marrant Baker (1873), who named the condition "erythema serpens." We agree with the observations of Rosenbach (1887), who stated: "The symptomatology is characteristic, and anyone having once seen the condition can readily make the diagnosis."

The patient complains of pain and swelling of a finger or part of a hand. The pain is often severe, is made worse by the application of heat, and is described as throbbing or burning. A history may be elicited of a scratch or puncture of the affected part by a meat bone, fish bone, fish skin, or butcher's knife, perhaps as long as two weeks before the onset of symptoms, but often no definite history of trauma is obtainable. Symptoms may have been present for several days or even weeks before the patient attends for treatment. It has been noticed that patients in the present series attended earlier if one of their workmates had previously been infected and had received treatment. The employees of a firm of Continental butchers were prominent for their early attendance.

Examination reveals a moderately inflamed swollen finger or part of the hand. Some evidence of the original injury is often visible as a stretched greyish scar. The swelling involves both the skin and the subcutaneous tissue, the margin of the skin-swelling is well defined, and the area of affected skin is dusky in colour. Although the patient complains of severe pain, tenderness is nothing like so apparent as in pyogenic infections of a similar area. Quite firm palpation of the infected part is tolerated. Associated lymphangitis and lymphadenitis are uncommon, and it is probable that their presence is indicative of secondary infection. Systemic effects have been described, but are uncommon.

Erysipeloid is a self-limiting condition. It is subject to spontaneous remission and ultimate resolution without suppuration, physical signs being present usually for a period of three to four weeks. Incision of the infected area benefits neither symptoms nor progress, and may result in secondary infection.

Clinical Cases

Two series of cases collected at King's College Hospital during 1948 and 1949 are reported. All presented the clinical features already described. The patients in the 1949 series were subjected to biopsy, and attempts were made to recover the causative organism. In three instances (Cases 2, 6, and 11) penicillin had unfortunately been administered before the biopsy was performed.

It will be noticed (Fig. 2) that no case was recorded during the first five months of 1949. This may have been due to failure to recognize the condition during this period. A search through the records, however, failed to reveal any hand infections with suggestive physical signs presenting at this time.

1948 Series

Thirty-one cases were seen which conformed to the clinical picture described. The seasonal incidence is shown in Fig. 1. The occupations of the patients were: housewives, 8; fishmongers, 8; butchers and poulterers, 6; bacon cutter, 1; unrecorded, 8. A

FIG. 1.—Monthly incidence of cases, 1948 series.

definite history of trauma from a possible source of infection was obtained in 12 instances. Eleven other patients admitted to the frequent occurrence of such trauma but were unable to implicate a specific instance. The possible sources included beef, mutton, and pork bones, poultry and rabbit bones, fish bones, and meat knives. Skate was the fish most often blamed. The duration of symptoms before attending hospital varied from one day to six weeks.

All the patients were treated with systemic penicillin. All but three received penicillin in aqueous solution, 250,000 units twice a day. The other three received penicillin in oil, 300,000 units daily.

Owing to misdiagnosis two patients initially received sulphadiazine, but penicillin was administered after the diagnosis had been made. Two patients who relapsed received sulphadiazine as well as penicillin after the relapse.

In most cases treatment lasted from one to four days. After this time the patients usually defaulted, presumably because their symptoms had subsided.

Only three patients other than the six who relapsed required treatment for more than four days. One patient persisted in attending for five days because of slight aching of the finger, the erythema having subsided after two days' treatment. A second case was undiagnosed for six days, and resolved spontaneously after a further two days. The third patient had noticed symptoms for six weeks and, for no good reason, received sulphadimidine for six days, after which resolution occurred.

Six relapses are known to have taken place. As in the rest of the series, initial treatment had lasted from one to four days. Relapses occurred three to eight days after penicillin administration had ceased. Further penicillin was given for two or three days, when, except in one instance, the patients ceased to attend. The exception received treatment for 13 days after relapse, and penicillin therapy, continued for seven days, failed to effect resolution. Oral sulphadiazine was administered, with doubtful effect, for a further six days, by which time symptoms had subsided.

1949 Series

Twenty cases were seen, in all of which a biopsy was taken immediately the clinical diagnosis was made (Table I). Unfortunately, in three cases penicillin had been started before the correct diagnosis was made, and this may have vitiated the results in these instances.

TABLE I.—1949 Series

No.	Date	Sex	Occupation	Probable Infecting Agent	Result of Culture	Progress
1	26/6/49	F	Housewife	Meat knife	+	Relapsing
2	30/6/49	M	Continental butcher	" "	—	"
3	3/8/49	F	Housewife	Fish bone	+	Uneventful
4	23/8/49	M	Fruiterer	"	—	"
5	5/9/49	M	Continental butcher	Meat knife	—	"
6	10/9/49	M	"	"	—	"
7	16/9/49	M	Cook	Chicken bone	+	"
8	22/9/49	F	Housewife	Cat scratch	+	"
9	26/9/49	F	Dressmaker	? Human placenta	+	"
10	26/9/49	F	Housewife	"	—	Relapsing
11	30/9/49	M	Fishmonger	Fish bone	—	"
12	11/10/49	M	Butcher	Rabbit bone	—	Uneventful
13	12/10/49	M	Continental butcher	Meat knife	+	"
14	14/10/49	M	"	"	—	"
15	19/10/49	M	Furrier	"	—	"
16	28/10/49	F	Housewife	Fish bone	—	"
17	2/11/49	M	Fishmonger	"	—	"
18	20/11/49	F	Housewife	"	—	Relapsing
19	27/11/49	M	"	"	+	Uneventful
20	6/12/49	F	Housewife	Meat knife	—	"

So far as possible biopsy was performed before treatment was started. The skin was cleaned with cetrimide ("cetavlon") and carefully dried. With 1% procaine an intradermal wheal was raised in the demarcated edge of the lesion. A small whole-thickness fragment of skin was excised from the edge of the lesion by the "pinch"

method. The specimen obtained was immediately placed in glucose broth and transferred to the laboratory for culture.

Free oozing of blood from the wound was easily controlled by firm pressure with a sterile dressing. No complication occurred as a direct result of the biopsy, and in every case healing was normal as in healthy skin.

This series of cases, taken in conjunction with the 1948 series, gives some indication of the frequency with which the disease is seen in the various seasons. The seasonal incidence for the 1949 series is shown in Fig. 2. The duration of symptoms prior to attendance for treatment was of a similar order to that of the 1948 series.

FIG. 2.—Monthly incidence of cases, 1949 series.

Every patient received penicillin either as twice-daily injections of 250,000 units of the aqueous solution or as a single daily injection of 600,000 units of procaine penicillin with aluminium monostearate.

Fifteen of the 20 patients in the series received penicillin for periods varying from one to twelve days. The shorter periods were due to default by the patients concerned. The other five cases relapsed whilst under treatment or after cessation of treatment, and penicillin administration was continued or started again in these. In each of these relapsing cases an average period of one month elapsed before resolution occurred.

Follow-up inquiries were sent to all patients. No reply was received from five, none of these being in the relapsing group. Of the other 15, five had relapsed and returned for treatment, while 10 reported that no relapse had occurred subsequent to treatment.

An analysis of the results of treatment with penicillin is detailed in Table II.

TABLE II.—Follow-up of 1949 Series

Patients returning Questionary:				
No. symptom-free within	3 days	..	..	4
" " " " in	3-6 days	..	..	3
" " " " " "	6-12 days	..	..	4
" " " " " "	with symptoms after 12 days	..	..	4
Total				15
Patients failing to return Questionary:				
No. defaulting within 6 days	..	..	..	5

Thus of the 15 patients of whom we have full details, 7 (47%) were symptom-free within six days, and 11 (73%) within 12 days. In an infection such as erysipieloid, in which symptoms may be rapidly relieved by penicillin, there is a tendency for those rapidly cured to default, and for those who relapse to return for further treatment. It is not unreasonable to assume that some, at least, of the five patients who defaulted and did not reply to the follow-up questionnaire remained symptom-free. If this is the case, the cure rates quoted above are unduly pessimistic.

The duration of treatment compares unfavourably with that quoted in previous papers on the subject (King, 1946), but the criteria of cure probably vary from clinic to clinic, and after our experience with some relapsing cases we were reluctant to withdraw penicillin too soon. Treatment was continued until all symptoms and signs had disappeared.

Erysipelothrix rhusiopathiae was cultivated in only seven of the twenty cases. Of these seven cases one relapsed after treatment. Three cases of the thirteen which failed to yield the erysipelotheix received some penicillin before biopsy was performed. Two of these three cases were members of the relapsing group. Excluding the relapsing group, the clinical courses of the six erysipelotheix-positive cases and the nine erysipelotheix-negative cases were similar. The strains isolated from these patients are the subject of a separate communication (Sneath, Abbott, and Cunliffe, 1951).

It is interesting that Case 1 failed to respond rapidly to penicillin although the erysipelotheix recovered from her biopsy specimen was sensitive to penicillin *in vitro*.

Discussion

Although several clinical types of erysipeloid have been described we have considered only the localized variety, as this was the sole type to come under our care.

On clinical diagnosis alone the numbers involved in our two series suggest that the disease is by no means uncommon. Case 12 of the 1949 series was referred from an out-patient department with the diagnosis of "low-grade infection of the finger." To us the clinical picture was characteristic and the clinical course was typical. It seems likely that many similar cases must occur in which the diagnosis is missed.

The monthly incidence in the two series appears to corroborate the seasonal incidence previously reported (King, 1946; McNeill Love, 1949; Boroda, 1949; McIntyre, 1950).

Even though the condition does not always respond rapidly to treatment an early correct diagnosis is an advantage. One patient in the 1948 series had erysipeloid for six weeks before attending for treatment. By then she had become much disturbed by the duration of the disease. A confident diagnosis and prognosis did much to allay her fears, and subsequent progress was satisfactory, although it is doubtful whether treatment played any significant part in her recovery.

The sources of the infection were diverse. A definite association with meat or fish is common in our experience, skate being the fish most often implicated. Its skin as well as its bones can apparently cause infection.

In the 1949 series unusual causative factors were suggested in two patients whose skin biopsies both yielded positive cultures. Case 8 followed a cat scratch, and Case 9 acquired the infection through burning a finger whilst incinerating a human placenta. The association with a burn has been observed before, although the diagnosis was not proved bacteriologically (Boroda, 1949).

From the two series no definite conclusions can be drawn about treatment. Penicillin often causes rapid amelioration of symptoms, and rapid cure is frequently achieved (47% in six days in the 1949 series). It has been impossible to decide the optimum duration of treatment, as patients often fail to continue their attend-

ances when their symptoms diminish. It is our clinical impression that the likelihood of recurrence is reduced if therapy is continued until all symptoms and signs, such as discoloration and stiffness, have disappeared. Relapses have been very frequent in those cases in which penicillin was withdrawn when some brownish discoloration of the skin was still apparent.

The value of biopsy in these cases must be discussed. It is always more satisfying to confirm a moderately certain clinical diagnosis, if the necessary ancillary investigation does not carry undue risk and inconvenience to the patient. In our experience biopsy of the edge of the lesion has given rise to no unfortunate sequelae in 20 patients. However, our proportion of positive cultures has not been high enough to prove that the procedure is diagnostically of great value. Blame for part of this may be laid on errors in biopsy technique. The erysipelotheix is a delicate organism whose growth seems to be easily inhibited by cetrimide, the cleansing agent used in all our cases (Sneath, Abbott, and Cunliffe, 1951).

Against this may be balanced the fact that it has been possible to isolate several strains of the erysipelotheix and to study its bacteriology and sensitivity to various antibiotics. In this way progress can be made in the study of the disease and its treatment.

Summary

Two series of cases of erysipeloid of the hand are reported, skin biopsies of the second series being cultured.

The condition is not uncommon, but probably the diagnosis is often missed.

In the 1949 series 47% of the patients were symptom-free in six days and 73% in 12 days after treatment with parenteral penicillin.

We would like to thank Sir Cecil Wakeley, senior surgeon, King's College Hospital, for advice and encouragement, Mr. E. G. Muir, surgeon to the Casualty Department, King's College Hospital, for permission to publish our work on these series of cases, and Dr. D. I. Williams for his helpful criticism in the preparation of this paper.

BIBLIOGRAPHY

- Baker, W. M. (1873). *St Bart's Hosp. Rep.*, **9**, 198.
 Boroda, C. (1949). *British Medical Journal*, **2**, 1411.
 Dolton, E. G. (1950). *Ibid.*, **1**, 438.
 Goodwin, M. A. (1950). *Ibid.*, **1**, 765.
 King, P. F. (1946). *Lancet*, **2**, 196.
 Love, R. J. McNeill (1949). *British Medical Journal*, **2**, 1411.
 Lowden, T. G. (1949). *Ibid.*, **2**, 1231.
 McIntyre, C. M. (1950). *Ibid.*, **1**, 186.
 Rosenbach, J. F. (1887). *Arch. klin. Chir.*, **36**, 346.
 Roxburgh, A. C. (1950). *Common Skin Diseases*. Lewis, London.
 Sneath, P. H. A., Abbott, J. D., and Cunliffe, A. C. (1951). *British Medical Journal*, **2**, 1063.

The Institute of Almoners has opened a supplementary register for certain of those almoners at present employed in the National Health Service who do not hold the Institute's own certificate of qualification. The supplementary register will be open until December 31, 1951, and admission will be according to experience and qualifications. Those applying must be over 30 years of age, engaged in medico-social work in a hospital, and known as almoner both at the time of application and continuously for three years prior to July 5, 1948. All persons admitted to the supplementary register will be entitled to apply for a special category of membership of the Institute. This will bring them generally under the aegis of the Institute in all professional matters, including negotiations for salaries and conditions of service.