two tablets, inserted once or preferably twice daily and used in conjunction with an alkaline or a 1 in 1,000 potassium permanganate douche, have relieved the condition quickly. It must be realized, however, that unless treatment is continued for from two to three months relapses are almost certain to occur. In my experience glycerin compounds should not be used, as the organism appears to thrive in this medium.

REFERENCES

- ¹ Donné: *C. R. Acad. des Sci.*, 1836.
- ² Bland, Wenrich, and Goldstein: *Journ. Amer. Med. Assoc.*, January, 1931, xcvi, 157.
- ³ Reuling: *Arch. f. Protistenk.*, 1921.
- ⁴ Marchand: *Zentralbl. f. Bakt.*, 1894.

EPIDEMIC CERVICAL ADENITIS

BY

S. LEVY SIMPSON, M.D., M.R.C.P.

PHYSICIAN TO WILLEDEN GENERAL HOSPITAL; ASSISTANT PHYSICIAN,
PRINCESS LOUISE KENSINGTON HOSPITAL FOR CHILDREN*With a Bacteriological Report by*H. W. SCOTT-WILSON AND F. KELLETT
M.B., B.CH. M.B., B.CH.

In January of this year Reginald Miller described an outbreak of "epidemic streptococcal adenitis." Ten children and two young adults were affected. The major features were a sudden onset, high fever, prostration, painful enlargement of the tonsillar and cervical glands, with a relatively slight inflammation of the throat, and recurrent rigors. The major symptoms were sometimes preceded by a stuffiness of the nose and sore throat for two days. There also appeared to be "a close association between epidemic adenitis of this type and influenza."

The worst of the illness was over in five to ten days, but the complete disappearance of the fever was a matter of three or four weeks. Miller observed that the epidemics occurred during the influenza season of the last two winters, and that "Cameron is, so far as I am aware, the only medical author who has recently called attention to this group of cases."

Cameron (1935) considered streptococcal adenitis as "one of the very common disorders of childhood, and yet one which, for some reason, has received inadequate description in textbooks, both of general medicine and paediatrics." He believed that this might explain the frequent confusion with glandular fever, in which disorder he states that the patients are not as a rule very ill, suppuration is almost if not quite unknown, profound anaemia, delirium, and excessive sweating are not found. "The differential diagnosis from streptococcal adenitis is therefore clearly and sharply defined."

In the small "house epidemic" herein described the clinical features are similar to those described by Miller and Cameron. It consisted of two children and four adults in one household, and another child who shared the same desk at school. By coincidence both households were those of doctors, who have kindly helped the writer in supplementing brief notes made at infrequent visits.

Case I

On March 3rd the patient, a girl aged 6 years, appeared to be starting a "head cold." In the evening she complained of generalized headache, which was much worse on the next day, when she remained in bed with a temperature of 102° F., sore throat, earache, drowsiness, and pains in the back and legs. The conjunctivae were injected and photophobia was a prominent feature. There was some stiffness of the neck and the glands of the anterior and posterior triangle were

slightly enlarged. Kernig's sign was said to have been equivocal.

On March 5th the pyrexia continued, the throat and ears were less troublesome, but the patient was drowsy and complained of headache. The next morning the patient appeared to be well, with a normal temperature, and went out mid-day for a short while. Although the evening temperature was only 99° F., the patient spent a restless night and was ill the next day, March 7th, with right earache, sore throat, running nose, headache, slight photophobia, and a temperature of 101° F.

On March 8th the temperature was normal and the patient better. Some nose bleeding occurred. The next day there was a further relapse, with sore throat, earache, pyrexia (102.2°), and considerable enlargement of the cervical glands. These involved the tonsillar glands, the anterior and posterior cervical glands on both sides, and the occipital glands. The cervical chain of glands was larger on the right side than on the left, and all were spontaneously painful, but especially so on palpation. To ease the pain the neck was held in a fixed position, at first with head retraction and later on as in acute torticollis. The tonsils were not large but somewhat embedded and slightly red. Tonsillectomy had never been performed. The ear-drums were infected, but not bulging (E. A. Peters). This acute condition persisted for a further three days, the patient being somewhat collapsed and drowsy.

On March 13th the temperature fell to normal and the glands began to subside. On March 16th and 17th there was a transitory relapse, with sore throat, further enlargement of the glands, and pyrexia of 102°, but subsequently uninterrupted recovery occurred. The glands, although decreased in size, did not disappear for another two weeks, and the patient appeared pallid and lacking in strength. Intermittent hiccups were observed in the third week of the illness. Blood count on March 10th: haemoglobin, 75 per cent.; erythrocytes, 4,060,000 per c.mm.; colour index, 0.92; leucocytes, 22,000 per c.mm., with 75 per cent. polymorphonuclear cells and 24 per cent. lymphocytes.

Case II

A woman aged 27, in the same household as Case I, felt very ill on March 9th, with shivering, severe headache, photophobia, sore neck, enlargement of the submaxillary lymphatic glands, intermittent earache, pains shooting down the cervical spine from the base of the skull, extreme drowsiness, and a temperature of 101° F. There was a history of previous head colds from February 11th to March 4th, but from that date until March 9th, which appears to be the commencement of the illness, the patient had no symptoms other than being "below par."

On March 10th the glands in the neck were larger, and small, tender glands appeared in the groins, axillae, and above the elbow-joints. The base of the skull was acutely tender. Perspiration was profuse, and the patient felt very ill. On March 11th the temperature fell to normal and the glands began to subside. From then on there was gradual recovery, but for another ten days the patient complained of general weakness and intermittent severe headaches. The latter were said to start at the base of the skull, travel over the top of the head to the root of the nose, and finally form a horizontal band around the base of the skull. The patient had had tonsillectomy as a child, and the throat did not appear inflamed; nor was sore throat a feature of the illness except in mild, transitory form.

On March 18th an erythematous rash was observed on the face, neck, thighs, and upper arms, and disappeared within twenty-four hours. On this day and the next there were bouts of obstinate hiccuping. At this time there was a transitory recurrence of painful enlargement of the cervical glands. At no time was the spleen palpable. On March 20th profuse epistaxis occurred.

On March 23rd there was a rise of temperature to 99.4°, with slight generalized colicky abdominal pains, diarrhoea, and some tenesmus. These symptoms persisted for a few days. There was then also a further transitory painful enlargement of the occipital glands; the subsequent recovery was uneventful, lassitude and pallor being features of the convalescence.

Case III

The third case, a young woman aged 20, came from the same household as Case I. She was quite well until March 9th, when she complained of severe headache and took to bed. The next day she was quite prostrate, with a temperature of 103° F., conjunctivitis, photophobia, drowsiness, slight sore throat, and painful enlargement of the glands of the neck. The tonsillar glands and those of the anterior and posterior triangle of the neck were all involved. The tonsils were moderately enlarged and somewhat red, but the degree of involvement was relatively slight compared with the acute glandular enlargement.

On March 12th the temperature was 100°; it fell to 98° on the morning of the 13th, but that evening again rose to 102°. During the next five days the temperature remained about 99°, the glands gradually subsided, and the general condition improved. The patient became afebrile on March 20th, but felt weak and lethargic.

On March 23rd there was an obstinate attack of hiccups lasting a few hours. The duration of the illness appears to have been about two weeks in this case. Blood count on March 11th: haemoglobin, 86 per cent.; erythrocytes, 4,350,000 per c.mm.; colour index, 0.99; leucocytes, 18,000 per c.mm., with 86 per cent. polymorphonuclear cells and 14 per cent. lymphocytes.

Case IV

A woman aged 36, from the same household as Case I, felt tired and "below par" on March 8th, 9th, and 10th. On the 11th she woke with aching of the back muscles and back of the neck, and a temperature of 100° F. In the evening she felt better, but the next morning the aches returned and were more extensive, reaching from the neck to the pelvis and down the back of the legs. Nevertheless the patient motored that day to keep an important engagement; in the afternoon she had a series of "chills," a headache, and a temperature of 100.5°. Her eyes felt hot, and she (a doctor) noticed some small tender discrete glands in the posterior triangles of the neck on both sides. At midnight the temperature was 103° and the pulse 96, the patient being slightly delirious.

The next day the tonsillar, cervical, and occipital glands were enlarged and tender, and the neck felt stiff. The tonsils had been removed some years previously, but the throat was slightly infected and felt a little sore. Photophobia, sweating, and prostration were features of the first few days. Some stomatitis was observed in the latter part of the first week. Constipation was present in the first two weeks, but in the third week mild abdominal colicky pains occurred, in association with diarrhoea, and persisted for some five days. The temperature remained high until March 17th, sometimes reaching 104°. The pulse was relatively slow, never exceeding 100. Slight pyrexia persisted for a further ten days, and the glands, although gradually subsiding, were still slightly palpable in the third week. The duration of the illness was about three weeks.

Case V

The fifth case, that of a boy aged 9, from the same household as Case I, was not characteristic. The enlargement of the glands was not a feature of the illness, but the time relationship and certain symptoms suggest that the infection was the same as in the other cases.

The boy was rather ill on March 3rd, the same day as his sister (Case I), with headache and feverishness. On March 4th he was kept in bed with photophobia, headache, and pains in the back and legs. He did not complain of enlargement of the glands of the neck, but these were not looked for. He was reasonably well during the next few days and was allowed up, but on March 10th there were slight abdominal colicky pains, and diarrhoea. This continued for another week, the patient running a slight temperature of 99° to 100°, but then the symptoms gradually cleared up and the patient went on holiday.

Case VI

The sixth case was that of a nurse, aged 55, who was attending to Cases I and V. On the third day after starting

duty she developed a slight sore throat, with enlargement of the tonsillar and cervical glands on both sides, malaise, and nausea. There was no rise of temperature and the nurse remained on duty, the illness lasting only a few days.

Case VII

This patient, a boy aged 5, shared the same desk at school with Case I. On February 29th he was evidently unwell, and had a temperature of 102°, but no definite complaints. On the morning of the next day a rigor occurred, and within a few hours there was an enlargement of some glands under the upper part of the left sterno-mastoid, with some pain. Sore throat was not a feature, but had been present for one or two days a week previously. The tonsils had never been removed, and were of moderate size. The temperature rose to 103.5°, and fluctuated between this and 99° during the next ten days. The right cervical glands were enlarged on the third day, but to a less extent than those on the left, where the whole of the posterior chain became involved. The glands were tender to touch, and the boy held his head in a fixed position as in acute torticollis.

On March 15th a large gland in the left posterior triangle was found to be fluctuating, with slight redness over the skin. The next day it was incised by Mr. N. C. Lake, and much pus obtained. Recovery was uneventful.

Clinical Features

The onset of the disease was usually acute, although it might be anticipated by a few days' malaise. In one case (VII) there was a history of a transient sore throat a week previously, but the significance of this was not established. The illness proper was ushered in by a sharp rise of temperature to 103° F., severe headache, drowsiness, photophobia (frequently with slight conjunctivitis), prostration, and rapid, painful enlargement of the tonsillar, cervical, and even occipital glands. Slight sore throat was usual, although not invariable, and in no case was the local inflammation of the throat more than relatively mild compared with the adenitis.

The glands might become palpable within a few hours, but sometimes were not a prominent feature for some days, and in Case V no enlargement was noticed. They were hard, discrete, and tender, and the increase in size was usually so considerable as to render the adenitis the presenting feature of the illness. The glands began to subside at the beginning of the second week, but might take a further three weeks to disappear. To minimize pain the neck was held in a fixed position, and acute torticollis might be simulated. In Case VII, a boy aged 5, one gland suppurated and thick pus was obtained on incision, a pure haemolytic streptococcus being grown on culture. This patient had moderately large tonsils, but three of the other cases had had tonsillectomy previously performed. In Case II, a female aged 27, there were also transitory painful enlargements of the axillary and inguinal glands, but neither in this nor in any other case was enlargement of the spleen detected.

Shivering or rigor on the first day was usual but not invariable, and recurrent rigors, as in the cases described by Miller, were not a feature. The temperature remained high for ten days or more, being 102° to 104° F. in the evening and a few degrees lower in the morning. The pyrexia was associated with free perspiration, sometimes very profuse. The pulse was usually, but not invariably, disproportionately slow compared with the temperature.

Transitory remissions were not uncommon when well-being with a normal temperature were features suggesting a rapid recovery, only to be followed a day later by complete recrudescence. Prostration within the first few days was the rule, and the patients' general condition usually gave rise to anxiety, at least among the relatives; but Case VI illustrated the possibility of ambulatory forms. Headache was usually a severe and depressing

feature, being occipital, generalized, or band-like in distribution.

Diarrhoea and slight colicky abdominal pain was a feature in four patients (Cases I, II, IV, V). It usually started in the latter part of the second week of the illness, and might persist for two or more weeks. In addition to the cases recorded a medical practitioner in attendance had abdominal pain with diarrhoea some two weeks after his first contact, and the condition persisted for three weeks. Such symptoms were not a feature of the cases recorded by Cameron (1935) or Miller (1936). Hiccup was a symptom in three patients (Cases I to III), on the fifth, ninth, and fourteenth days respectively. Epistaxis occurred on the fifth day in one patient (Case I) and on the eleventh day in another (Case II). Convalescence was associated with weakness, inertia, and some anaemia. The incubation period would appear to be about six days or less, the duration of the acute phase about ten days and of the total illness about three weeks.

Bacteriological Investigation

Throat Swabs.—Swabbings were examined from the throats of Cases III (fifth day of illness), IV (fifth day of illness), and VI (second day of illness). In all cases a mixed growth was obtained of streptococci of *viridans* and non-haemolytic types, similar to those found in the majority of healthy individuals. No type was common to all of the cases or could be considered of aetiological significance. Haemolytic streptococci were not found in any of the cases.

Pus.—A specimen of pus from Case VII, obtained by incision of a suppurating gland, contained large numbers of streptococci, and on culture gave a pure growth of a long-chained haemolytic streptococcus.

Blood Culture.—This was carried out on Case IV during the first week of illness, the blood being taken when the temperature was 103°. All the cultivations (aerobic and anaerobic) remained sterile after ten days' incubation.

Faeces.—In Case V during the period of diarrhoea the sample of faeces examined contained no mucus, pus, or recognizable blood cells. On cultivation the predominant growth consisted of streptococci capable of surviving fifteen minutes' exposure at 60° C. (*Streptococcus faecalis*)—this formed about 95 per cent. of the colonies. The remainder of the growth consisted of a haemolytic strain of *B. coli*.

Animal Inoculations.—Blood was taken from Case IV at the same time as that taken for blood culture—1 c.cm. of 3 per cent. sodium citrate plus 9 c.cm. blood. Three mice and one guinea-pig were inoculated intraperitoneally. The mice received 1/2, 1, and 2 c.cm. respectively, and the guinea-pig 3 c.cm. None of the animals showed any sign of disease, and all were alive and well four weeks after inoculation.

Agglutination Tests.—Agglutination tests were carried out in Cases II and IV. In neither was any agglutination obtained with the standard emulsions of *B. typhosus* ("H" and "O"), *B. paratyphosus* A, *B. paratyphosus* B ("H" and "O"), or *Br. abortus* Bang. The serological test for glandular fever was completely negative in all dilutions from 1 in 4 to 1 in 4,000. In Case IV these tests were performed at the end of the third week of illness, but in Case II the time relation of the test to the time of onset was uncertain.

Comment

This small house epidemic appears to resemble those described by Cameron (1935) and Miller (1936), although there are some additional features. The result of inquiries made by the writer among a number of general practi-

tioners appears to indicate that there has been a fairly widespread epidemic during the last few months, and further personal and hospital experiences leave me in no doubt that the epidemic is still widespread. According to Cameron (*v.s.*) the clinical differentiation from glandular fever should offer no difficulty.

I do not believe that the issue is necessarily so simple, and in a very critical account of glandular fever (infective mononucleosis) by Baldrige, Rohner, and Hausmann (1926) a symptomatology is described (especially in the epidemic form) which is indistinguishable from that of the present series as well as from that of Cameron and Miller's cases. The blood counts in these three series were too few to exclude glandular fever, but so far as these go do suggest a different disease in that a relative lymphocytosis was never present. Even so, however, Baldrige and others (1926) observed that "a leucocytosis of varying degree was present in most of the cases, at some time during the course. In general, cases with marked temperature reactions showed a leucocytosis with relative polymorphonuclear increase during the febrile period." In one patient of the present series (Case II) there was enlargement of the axillary and inguinal glands, which Cameron states may be involved in glandular fever, but not in epidemic streptococcal adenitis. An important diagnostic point in the present series was the complete negativity of the agglutination test for glandular fever.

I am of the opinion that an open mind on the aetiology of this symptom-complex must still be maintained, and that neither the streptococcus nor any other organism is yet established as the aetiological agent. It is hoped that this communication will lead to more intensive investigation of further cases, preferably in an institution.

I wish to express my indebtedness to Drs. Tudor Hart, A. N. Macbeth, J. Malleon, and Mr. W. M. Dickson for their valuable co-operation and help.

BIBLIOGRAPHY

- Baldrige, C. W., Rohner, F. J., and Hausmann, G. H.: *Arch. Int. Med.*, 1926, xxxviii, 413.
Cameron, H. C.: *Clin. Journ.*, 1935, lxi, 3.
Miller, R. M.: *British Medical Journal*, 1936, i, 105.

Clinical Memoranda

Effect of Posture on Foreign Bodies in the Stomach

It is obvious that a foreign body, such as a coin, button, or whistle, in the stomach will, when the patient is erect, gravitate to the lower pole. It is not, however, so generally recognized that when the patient is supine the foreign body takes up a position close to the cardiac opening, and will occasionally even re-enter the oesophagus. In either of these locations the foreign body remains out of reach of the pylorus, and there is therefore no opportunity for expulsion. In the prone posture, especially if the left side is slightly elevated on a pillow, a coin or other smooth body will at once gravitate to the entrance to the pyloric canal, where it is soon gripped and passed out of the stomach.

In a series of seven cases recently observed the patients were given the usual stodgy diet and placed in the position described for half an hour or so after each meal. The coins had been present for three to seven days, but after the adoption of this scheme were recovered in six cases and became a total loss in one case within twenty-four to forty-eight hours. The coins were five half-pennies (one child had swallowed two), two shilling pieces, and one penny (swallowed by a child aged 3 years). Very occasionally temporary delay may occur at the ileo-caecal valve, but this is the exception, and when once