

CASE REPORTS

GANGRENE OF THE EXTREMITIES IN AN INFANT

BY

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Case record

One of twins, a girl aged eleven weeks, was admitted to Llandough Hospital on December 28, 1937, because of feeding difficulties. She was born a month prematurely after a normal confinement, and her birth weight was 4 lb. 6 oz. Her twin, also a girl, was admitted at the same time with a similar complaint. This baby was discharged after three weeks in hospital, having made good progress. The history of the patient here discussed was that she had been breast-fed for three weeks and then weaned under the impression that 'the breast milk was not agreeing with her.' She was given a half-cream dried milk and later a 'humanized' dried milk. There had been occasional vomiting, the stools were constipated, and she was not gaining weight, which on admission was 4 lb. 8 oz.

When first seen she was a little wasted, with some dehydration, and was put on a 'humanized' dried milk with dextri-maltose, and she started to improve in her general condition and her weight began to go up. Ten days after admission the temperature suddenly rose to 104° F. in the rectum and she became fretful. A red area developed over the right side of the face and ear with a well-marked raised edge, and she was transferred to the Cardiff City Isolation Hospital at thirteen weeks old with erysipelas.

Whilst in the Isolation Hospital she was given sulphanilamide, a quarter of a 5-grain tablet three times a day, with rapid improvement, and was re-admitted to Llandough Hospital after four days, with no areas of redness, but a little oedema of the scalp on the right side. Her temperature was normal and her general condition had improved. Two days afterwards a small localized abscess developed over the right parietal bone, and a day later similar swellings appeared on the dorsum of the left foot, over the proximal phalanx of the third finger of the right hand, and the proximal phalanges of the index and third fingers of the left hand. The abscesses on the dorsum of the foot and on the scalp were incised and thick whitish pus obtained, which grew non-haemolytic streptococci with no viridans reaction. The other septic areas were not incised and healed in about two to three weeks with the exception of the right index finger, which remained swollen, but not tender or fluctuant, for some weeks. The temperature showed an occasional rise to 99°-100° F. throughout this period, but the child gained weight slowly and took her feeds well.

On March 8, i.e. at twenty-two weeks old, both feet were noticed to be

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cyanosed, especially the toes, and there were small purpuric spots in the pulps of all the toes and extending along the terminal quarter of an inch of each toe. The skin was warm to the touch in both feet and the dorsalis pedis artery pulsating. The tips of the fingers of the left hand and the little fingers of the right hand were similarly affected. On the following day the hands and feet were much the same, but a small purpuric area was present on the tip of the nose. During the next day or so the cyanotic area seemed to be spreading up the fingers of the left hand and the second, fourth and fifth fingers of the right hand. Meanwhile the skin had developed a scaly eczematous rash mainly on the trunk and scalp, with a number of primary intradermal pustules. Induced hyperaemia by manual compression of the limbs increased the cyanosis, and

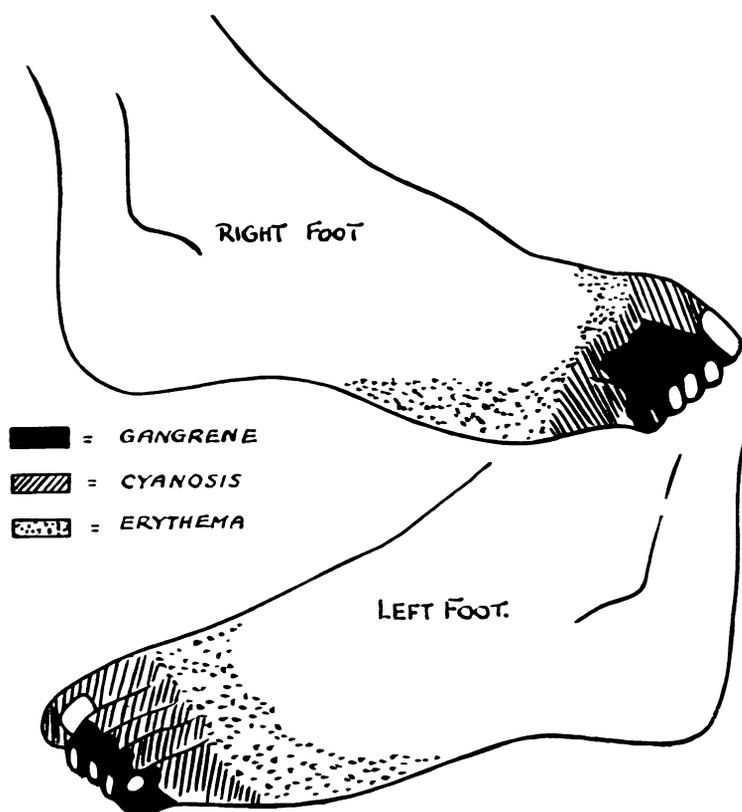


FIG. 1.

when the pressure was released the capillaries dilated well except at the extreme tips of the fingers and toes. Fourteen days after the onset of the cyanosis the middle toes of both feet became gangrenous, to be followed by gangrene of other toes, with clear lines of demarcation at the base of the gangrenous areas. On March 24, at the age of twenty-four weeks, the condition of the extremities was as follows :

Right foot : Tip of big toe gangrenous with cyanosis as far as the base. Second and third toes gangrenous to the base. Tip of little toe gangrenous, with cyanosis as far as the base. The cyanosed areas extended a little beyond the base of the toes, and proximal to this was a zone of

erythema extending about half an inch along the dorsum of the foot, and rather further along the outer edge and sole.

Left foot : Tips of second, third, fourth and fifth toes gangrenous extending to level of terminal interphalangeal joint with cyanosis of all toes as far as their bases. An erythematous zone extended along the dorsum of the foot and outer side similar to that on the right foot.

Right hand : Cyanosis of fingers and thumb as far as level of distal interphalangeal joint, except of little finger, where the cyanosis extended to the base, and continued into an area of erythema.

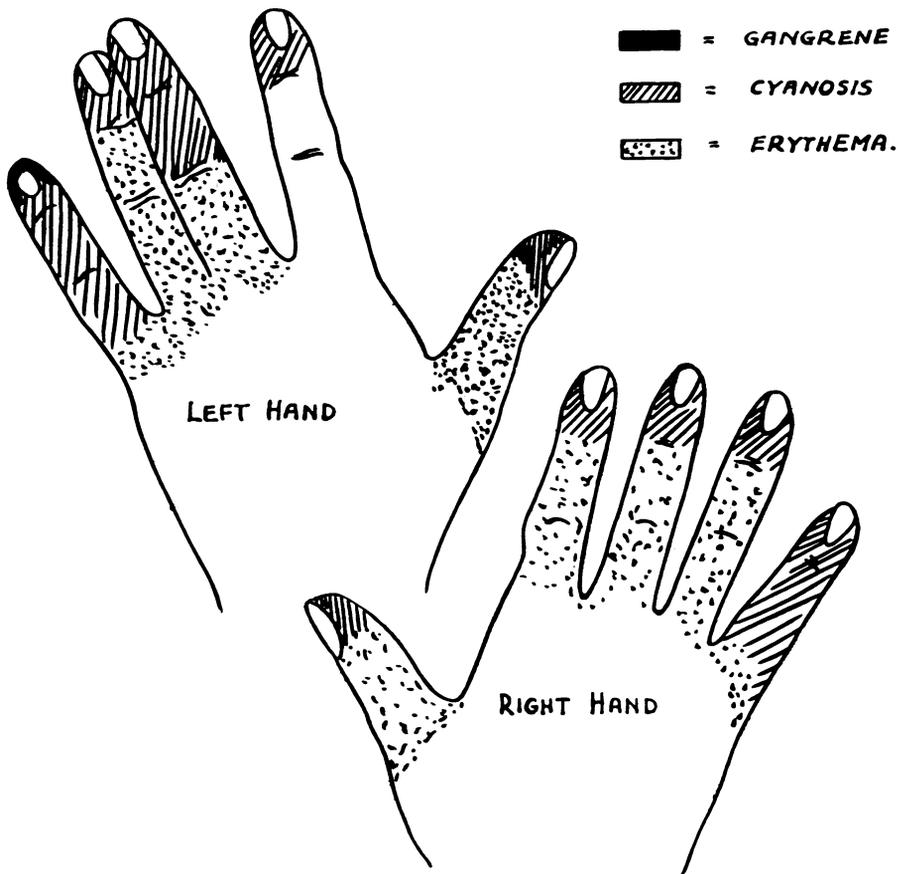


FIG. 2.

Left hand : Cyanosis of tips of thumb, second and fourth fingers as far as level of proximal joint, and of the little finger as far as the base, with gangrene at the tip of this finger. The thumb, third and fourth fingers were erythematous to their bases beyond the cyanotic zones (see fig. 1 and 2).

Throughout this period the child's condition remained amazingly good. She took her feeds well, gained weight slowly and had no digestive disturbances. The eczematous condition of the skin improved with treatment, and it was with disappointment that there was found, fourteen days after the onset of the

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gangrene, a blood-stained nasal discharge which gave a positive virulence test for diphtheria. She was again transferred to the Cardiff City Isolation Hospital, where she remained for two months and progressed well, gaining from 6 lb. 7 oz. to 9 lb. 6 oz. While there the toes separated at the lines of demarcation without any signs of sepsis, and on re-admission to Llandough Hospital at the age of seven months her condition was good, though she was still under normal weight. The state of her hands and feet was as follows :

Right foot : Big toe, gangrenous tip separating. Second toe separated at level of distal interphalangeal joint. Third, fourth and fifth toes separated at level of proximal joints.

Left foot : Big toe, normal. Second, third and fifth toes separated at level of proximal interphalangeal joint. Fourth toe separated at level of distal joint.

Right hand : normal.

Left hand : normal except for loss of small area of pulp of the little finger.

Treatment.—Feeds of ‘humanized’ dried milk with dextri-maltose were continued throughout. Iron and a vitamin A and D concentrate were also added. The eczematous condition was treated by bathing with lot. hydrarg. perchlor. 1 : 4000 and calamine lotion. For the nasal diphtheria 14,000 units of anti-diphtheric serum were given. As soon as the cyanosis was discovered the hands and feet were wrapped in cotton-wool and the limbs kept as warm as possible with hot bottles. No wet dressings were applied at any time and a simple dusting powder was used. Hyperaemia was induced by repeated manual compression on the forearms and legs. A better reaction was invariably obtained in the upper than the lower limbs. This method was continued until the onset of gangrene. When in the Isolation Hospital for erysipelas she was given a quarter of a 5-grain tablet of sulphanilamide three times a day, and on return to Llandough Hospital another form of this drug was given in a dose of a quarter of a 3¼-grain tablet three times a day. This was continued for a month until the onset of cyanosis, but no untoward general symptoms were noted attributable to its use.

Investigations.—Blood counts showed no gross abnormality at any time beyond a slight secondary anaemia. During the purpuric and early cyanotic stage the following figures were obtained :

Blood platelets : 180,000 per c. mm.

Bleeding time : 100 seconds.

Coagulation time : 45 seconds.

The Wassermann reactions of mother and child were both negative.

Culture from the pus grew non-haemolytic streptococci, not of the viridans type.

Discussion

An unexpected clinical feature was the slight general disturbance throughout. Gain in weight was slow, but there was no loss in weight at any time, and the infant always took her feeds well with no digestive disturbances ; all this in spite of gangrene, erysipelas, eczema and a virulent nasal diphtheria !

Gangrene in an infant is a rare event. Dohen (1934) published an example of gangrene in a new-born infant and reviewed the literature of the condition in the newly born. He was unable to arrive at any definite etiological cause, and only one case was associated with sepsis—in the umbilicus. A patient who

developed gangrene on the seventeenth day showed at autopsy a thrombosis of both anterior and posterior tibial arteries with 'mediitis of both arteries' histologically. Other causes of gangrene in infancy that have been recorded are those associated with congenital syphilis (Bloise, 1936), diabetes (Lawrence and McCance, 1931) in association with severe infectious fevers and in pink disease (Rocaz, 1936).

So far as the present case is concerned, congenital syphilis was excluded serologically by a negative Wassermann reaction in both mother and child, and clinically by the absence of any other signs of syphilis, and the normal twin sister. Nasal diphtheria developed after the onset of gangrene and the child's condition was so good throughout that it can hardly be considered a possible factor.

It would appear from the facts of the case that the likely cause for the production of the gangrene was an arteritis produced by the streptococcal infection and leading to thrombosis of the phalangeal arteries, and that rupture of affected capillaries led to the purpura. The presence of dry gangrene throughout and the response to hyperaemia suggested a thrombotic process and not an embolic one, since the latter would probably bring infection to the site of lodgement. Moreover, the absence of any central focus of infection and the good condition of the infant were against an embolic phenomenon. An exact proof of a streptococcal arteritis cannot of course be offered, but it is felt that this theory offers the best explanation of the findings. In view of the prolonged use of sulphanilamide it is natural to wonder if it may not have taken some part, but no reference can be found to thrombosis or gangrene following its use.

Acknowledgements

Thanks are due to Dr. Emrys Harries, Medical Superintendent, Cardiff City Isolation Hospital, for permission to use his records and for the care he took of the child, and to my house physician, Miss Catherine Howell, for her note-taking and the time and attention she gave to the baby.

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Arch Dis Child 1938 13: 366-370
doi: 10.1136/adc.13.76.366

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