THE TREATMENT OF SMALL-POX BY SALOL.

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DR. CHARLES BEGG has strongly advocated the treatment of small-pox by salol. This drug has of course been previously used, especially to check the diarrhoea of small-pox; but Dr. Begg claims for it the remarkable power of practically arresting the development of the rash in the vesicular stage, only a few pustules being formed when salol is administered in doses amounting to 60 grs. daily. As a subsidiary effect he has noted the absence of cutaneous irritation, which is one of the most distressing features of the disease. Dr. Begg attributes the efficacy of salol to its selective elimination by the skin, as proved by the odour emanating from patients who are taking it.

Admitting the cutaneous excretion of salol or rather some antiseptic derivative, it appears to us that in the vesicular stage of small-pox the conditions are favourable to the production of the effects mentioned above. No doubt the specific virus of small-pox is present in the vesicles; but the conversion of the vesicular contents into pus must be regarded as due, in part at least, to the action of secondary micro-organisms, especially staphylococci. It is reasonable, therefore, to look for some effect when salol is given, whereby the growth of secondary pyogenic bacteria is hindered or prevented. This is the more likely because a mere antiseptic, as against a germicidal effect would be sufficient to produce such a result. Given the result, a proportionate amelioration of the secondary fever must follow, since the latter is attributable to the absorption of toxins from the pustules. This is of great importance, because in fatal cases death most frequently occurs during the secondary fever. Consequently, if salol can be relied upon to prevent extensive pustulation with the febrile disturbance and other toxic effects which it induces, the treatment is one which should save otherwise hopeless cases. A minor, but by no means inconsiderable advantage which must accrue from an absence of pustulation is diminished scarring. For while in the vesicular stage the middle layers of the rete Malpighii are mainly affected, the subsequent inflammatory process penetrates more deeply, and the degree of scarring depends on the depth to which it extends.

There is a disturbing factor which makes it difficult to estimate any arresting effect of salol on the development of the rash. In vaccinated subjects even the confluent form of the rash occasionally undergoes partial arrest in the stage of maturation, and in milder cases this tendency is both more marked and more frequent. Hence, if salol is administered to a patient having well-defined vaccination scars, it is necessary to weigh the clinical facts carefully before attributing any abortive manifestation to the treatment. Our cases indicate that in forming an opinion the rate of maturation is an important point. But, even if the benefit obtained from salol be restricted to the certain prevention of the intolerable irritation, much is gained. For not only does this symptom cause sleeplessness and nervous exhaustion, but, owing to the rubbing, scratching, and tossing about, many of the pustules rupture, so that the oozing of their offensive contents is an additional discomfort.

In light of the above considerations we recently adopted the treatment by salol, as recommended by Dr. Begg, in a considerable number of small-pox cases admitted to Dagenham Hospital. As pointed out by Dr. Begg himself, confirmation of his results was specially necessary, because his patients were treated in China—a difference of locality so great as to involve a possible alteration in the type of the disease.

Over a score of cases were observed at Dagenham Hospital. All but 8 of these, however, were greatly modified by vaccination, and, although they did well under salol, reference to them is omitted because such a result was almost certain apart from treatment. In one instance a patient complained of slight irritation, while in another the salol produced marked depression. The history of the 8 remaining cases is given in outline, only the salient facts being mentioned. For convenience in following the development of the rash the

duration of the disease is generally calculated from the time of its appearance instead of from the day of onset.

CASE I.—A. G., aged 30, was admitted on January 22nd. He was a man of athletic build, with an excellent past history. His temperature was 101.8° F., pulse 96, and respirations 24. The vital organs were healthy. He stated that he had been vaccinated in infancy, but no scars could be found. The rash was confluent on the face and distal portion of the limbs. It had appeared about forty-eight hours previously, and was becoming vesicular on the forehead. The prodromal symptoms had been very severe. The patient's mental condition was confused, with slight rambling and occasional excitement. Ten grains of salol were ordered four-hourly, and the treatment also included a suitable diet, a boroglyceride mask, and a cold creolin lotion sponge bath twice daily. Late on the second evening after admission the patient suddenly jumped out of bed and attacked a nurse with a coal shovel. He had

now taken 60 gr. of salol, and the drug was stopped in case it should aggravate the delirium. From this time onwards a progressive improvement in the patient's mental condition was evidenced, and he gave little trouble. On the fifth day of the rash the vesicles were at their height. During the following two days it was noted with surprise that very little change had taken place in them, the majority showing only the faintest yellow tinge. It was evident that maturation of the rash was being delayed, although it appeared impossible that so marked a modification could be induced by a single drachm of salol. The subsequent history of the rash may be summarised in the statement that pustulation was restricted to a group of pocks on the forehead, while elsewhere only about half the vesicles attained a semi-pustular condition. At the time when the rash was at its acme the skin of the face was distinctly swollen, yet the irritation was inconsiderable. There was an entire absence of offensive odour. Apart from the patch on the forehead, the rash dried up and scaled off with exceptional rapidity. The course of the temperature calls for special attention. On the evening of admission it was, as already stated, 101.8° F. It fell during the next few days, and remained normal from the seventh day of the rash. The intensity of the primary attack was shown by the state of extreme exhaustion in which the patient remained for some weeks after convalescence. This fact, taken with the early nervous symptoms, makes it likely that the patient would not have survived the severe secondary fever which, in the ordinary course of events, seemed inevitable. We therefore consider that in this case, with a total dose of only 1 drachm, salol was of great benefit. It is impossible otherwise to explain the partial but striking arrest of maturation. Except for some distinct pitting on the forehead the scarring was very slight.

CASE II.—J. B., a man of good physique, came under treatment on February 11th. He had not, apparently, been vaccinated. The rash was in the sixth day, typically confluent and vesicular. On the face the contents of the vesicles were turbid and there was slight swelling of the skin. The treatment adopted was similar to that in the first case, the salol being increased to 15 gr., four-hourly, and continued for a week. On the seventh day the rash was completely pustular on the face, while elsewhere it was semi-pustular. The skin of the face was markedly swollen. There was no irritation or offensive odour. The rash dried up with extreme rapidity and the patient was up on the 20th. As in the first case the course of the temperature was very striking. The secondary fever subsided as the rash developed. It attained the highest point (102.6° F.) on the seventh day of the rash, and was normal on the tenth day. There was no doubt that the salol had considerable effect in modifying this case. The scarring was slight, and it is doubtful if it will remain permanently visible.

CASE III.—F. M., a boy, aged 6, was admitted on February 23rd. There was no evidence of vaccination. The rash, of four days' duration, was discrete on the face, fairly profuse on the extremities, and sparse on the body. The palms and soles were affected. The vesicles were large, typically umbilicate, and their contents had a yellow tinge. Ten gr. of salol were given four-hourly. Two days later a mild form of pustulation was general, there being a faint areola round the pocks on the face. There was no odour. Irritation was distinct, and the patient wore lint gloves. On the following day desiccation was apparent, and was rapidly completed. The temperature on admission was 100° F. It fell steadily while pustulation progressed, and was normal on the seventh day of the rash. This case evidenced the effect of salol in preventing odour, and apparently in modifying the secondary fever. It is doubtful to what extent pustulation was affected. The patient was slightly, but permanently, marked.

CASE IV.—Mrs. M., aged 22, was ward on March 4th. The case was of special interest, because the patient was in the seventh month of a first pregnancy. Her past history was good. Four faint scars from vaccination in infancy were found. The rash, which had been present for about twenty-four hours, was papular and discrete. It was most abundant on the body. The case was, in fact, a partly modified one. The temperature was 100.4° F. The patient appeared anxious and somewhat excited. The same treatment was adopted as in the previous cases, the salol being prescribed in 10-grain doses every four hours. On the third day of the rash it was still papular and just beginning to disappear. At 4 A.M. on this day a child was born. Beyond some delay in the expulsion of the placenta, the labour was normal and hemorrhage was not excessive. The infant (not affected by small-pox) only survived a few hours. In the after-treatment the salol was continued, and a four-hourly douche of creolin lotion ordered. About the time of the confinement extensive subcutaneous extravasations, not unlike those seen in hemorrhagic small-pox, appeared on the chest, back, and upper part of

the arms. From February 7th to 16th the temperature was irregular, never attaining the normal point or rising above 103° F. The patient was restless and semi-delirious at night. There was severe pain in the back over the sacrum, for which morphine hypodermic injections were given periodically. The vaginal discharge was scanty and only slightly malodorous. At first blood stained, it subsequently became dark and grumous. The history of the case from this time was that of localised pelvic cellulitis going on to recovery.

CASE V.—E. C., a robust woman, 29 years of age, came under treatment on March 9th. She had been vaccinated in infancy and three well-marked

foveated scars were present. The rash (third day) was vesicular and of the semi-confluent type. The treatment already described was ordered. By the 12th the pocks were only semi-pustular on the face. On the 14th the rash was at its height. On the face nearly all, and elsewhere about half, the pocks were distinctly pustular. The skin of the face was considerably swollen and there was slight conjunctivitis. Irritation was absent and no foetid odour could be detected. Desiccation was rapid during the next few days and the patient was up on the 20th. There was a rise in temperature on the 13th, 14th, and 15th, with 101° F. as the maximum. Beyond this there was no second

ary fever. The most notable effect of salol in this case was the absence of irritation, even when there was distinct oedema of the face, and the mildness of the secondary febrile symptoms. Its influence on maturation was less obvious, although the latter appeared to be delayed. The patient was permanently but very slightly marked.

CASE VI.—J. W., a hale old man of 65, came under notice on March 9th. Vaccinated in infancy, he had three fairly distinct scars. The rash was vesicular and semi-confluent. It had appeared three days previously. During the first three days after admission the vesicles enlarged somewhat, and over half of them on the face and scalp became pustular. Twenty-four hours later a smaller proportion of those on the body and limbs had matured. The pustules were small and no irritation was felt. There was an absence of unpleasant odour. The rash now remained almost stationary for twenty-four hours, and then quickly dried up. On admission the temperature was 102.8° F., whence, after a slight rise, it fell to the normal point within three days. Excepting a rise to 99.8° on March 14th, it then remained normal. If this was the effect of the salol, an inference difficult to reject, the benefit obtained was substantial, since in a patient of advanced years severe secondary fever is especially dangerous.

CASE VII.—C. G., a female patient, aged 33, was first seen on March 9th. She had been vaccinated in infancy, three faint scars being left. There was nothing noteworthy in the patient's past history. The rash was in the fourth day, coherent on the face, and fairly profuse on the limbs and body. It was vesicular, but on the face the vesicles were in the earliest stage of pustulation. Salol was given in 10-grain doses four-hourly. The rash matured very slowly, and on its seventh day only about half the vesicles had become distinctly pustular. On the forehead and left angle of the mouth were confluent patches where the suppurative process was severe. The temperature for the first five days after admission was slightly raised and then remained normal. At one time there was trivial irritation, but never any offensive odour. The most noticeable feature in this case was the delayed maturation. Apart from the confluent patches permanent scarring appeared improbable.

CASE VIII.—Mrs. P., aged 38, a multipara, seven months pregnant, was admitted on March 12th. As a result of vaccination in infancy, three faint scars were just visible in a strong light. The rash was semi-confluent on the face and extremities. It had appeared thirty-six hours previously, and was still papular. Salol was given in doses totalling to 60 grs. daily. It is unnecessary to detail the subsequent history of the rash, as its development was typical, with almost unmodified pustulation. The secondary fever was mild. There was some offensive odour for forty-eight hours, but the patient did not complain of any irritation. There was severe pain in the palms and soles. The salol caused considerable depression of spirits, and towards the end of the treatment the urine was dark and scanty. The fact that the patient did not abort is interesting. It will be noted that in this case the conditions were specially favourable for treatment by salol. The rash was in its earliest stage, and the patient was able to take the drug until convalescence was complete. Yet no definite effect on maturation was manifest. It can, however, be said that the case ran an exceptionally favourable course, with mild secondary fever, no irritation, and a practical absence of scarring.

CONCLUSIONS.

It appears from the above series of cases that salol may

practically avert general pustulation (for example, Case 1), and even have a partial abortive effect when given after maturation has commenced (Case 11). The influence of the treatment on maturation is, however, not constant in degree, and in one case was almost nil. Short of an abortive effect, it almost invariably hinders pustulation, so that the pustules form tardily, the process being imperfect in a much higher proportion than usual. The cutaneous inflammation is slight, and irritation commonly absent even in confluent cases. There is generally an entire absence of unpleasant odour. Scarring is inconsiderable and often absent, the scabs scaling off with great rapidity. The most remarkable effect of the treatment is its effect on the secondary fever, which, if not absent altogether, is as a rule of little importance.

These results appear to us to resemble, but exceed, those obtained by the red light treatment.

On the whole, the statement is justified that salol affords a means of treating small-pox superior to the methods in vogue.

THE RADICAL CURE OF FEMORAL HERNIA.

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MR. W. H. BENNETT, writing in 1893 of the radical cure of femoral hernia, says:

The effectual treatment of the ring and canal is a problem which has yet to be solved. The truth is that no plan for dealing with the aperture through which a femoral hernia comes will be found to be permanently good which does not include the essential detail of placing a barrier across the upper aspect of the femoral ring. Unfortunately the detail alluded to can only be carried out by performing an abdominal section, by means of which in the cadaver it is quite easy to dissect up and stitch a mass of muscle, etc., across the ring. In the living this operation would, I think, be too severe and difficult to justify its performance.

With Mr. Bennett's dissatisfaction with methods at present in vogue directed towards the radical cure of femoral hernia I imagine many surgeons will be disposed to sympathise. The operation which is, I suppose, most commonly practised, aims at occluding the opening by a suture or sutures passed through the fibrous ring in front of and behind the crural canal. This method I believe to be wrong in principle and disappointing in practice. These ligamentous structures do not readily lend themselves to the process of union, and probably as a general rule separate as soon as the ligature material ceases to keep them in apposition.

Mr. Lockwood expresses himself satisfied with an operation which he is accustomed to perform; he brings together the ligaments of Hey and Cooper. But this is open to the objection just alluded to, and is, moreover, a striking example of closure of the lower—the wrong—end of the canal.

For a long time I have thought that a more rational procedure would be to expose the region above Poupart's ligament by a division of the aponeurosis of the external oblique. By this means only did it appear to me possible to satisfactorily occlude the upper end of the crural canal. I find that Tuffier in 1895 recommended this procedure, but the subsequent and essential step, the closing of the opening, he effected by a method which could have been accomplished nearly, if not quite, as well by operation from below.

I have from time to time tried different devices on the dead subject, and that which appeared to me to give most promise of success I carried out on April 24th at the Adelaide Hospital on a woman about 45 years of age. I was assisted by my colleague, Mr. F. T. Heuston.

The structure which is most at fault in cases of femoral hernia is probably Gimbernat's ligament, and I would describe the present method as a reinforcement of that structure.

The incision was commenced at a point about 2 inches from the pubic spine and $\frac{3}{4}$ inch above Poupart's ligament; thence it was carried inwards as far as the region of the hernia, and here it was curved to descend vertically over the sac. The aponeurosis of the external oblique was exposed in the first part of the incision, the sac of the hernia in the second. The sac was fully isolated from its surroundings. Next an opening was made above Poupart's ligament, in the direction of the fibres of the aponeurosis. The sac was now easily dislodged, and with the adjoining peritoneum pushed up from the region of the upper end of the crural canal. The fibres of the trans