50 dilutions of formol-toxoid for the intradermal test of susceptibility to toxoid. By thus increasing the amount of toxoid injected, it was hoped to produce a more lasting local reaction, which would be discernible a week later, when the final reading of the Schick test is due.

Fifteen children, aged from 2 to 10, were accordingly given 0.2 c.cm. of a 1 in 100 dilution of formol-toxoid (B 8706). Two (aged 2 and 5 years respectively) were positive, but the reaction quickly faded after forty-eight hours. Nine nurses (aged 18 to 25 years) were then tested, and, as expected, seven of these gave very definite reactions, but only in five of these was the reaction discernible at the end of the week. Eighteen children (aged from 5 to 14) were then given 0.2 c.cm. of a 1 in 50 dilution of formol-toxoid (B 8707) intradermally. Thirteen were negative, but of the five who gave a positive reaction in only three was the reaction discernible a week after the test.

It is obvious that increasing the strength of the formol-toxoid does not solve even one of the difficulties arising out of the employment of the Moloney test.

A trial was next made of a method which aims at facilitating the immunization of children with formol-toxoid without the need for a preliminary intradermal test. By this system—which Dr. O'Brien calls the "universal or detector dose" method—all children at their first visit are given subcutaneously a small dose, say 0.05 c.cm., of formol-toxoid made up to 1 c.cm. in saline. This minute dose of toxoid might be expected to cause a recognizable reaction in those who are sensitive, but it was thought that this reaction would not be severe enough to prevent its universal application as a detector dose. Children negative to the detector dose would receive two full doses of 1 c.cm. of potent formol-toxoid later, whereas those showing some reaction could be immunized, either by a series of small doses of formol-toxoid spread over a long period, or, more rapidly, by two doses of T.A.F. By this system immunization of insensitive children with formol-toxoid could be completed in the usual three visits. Eighteen children (aged from 3 to 14) were dealt with in this way. Thirteen children showed no reaction of any kind after the "detector dose," but five children showed marked local reactions, and two of these (aged 7 and 9 years) gave general reactions as well, both having temperatures of 100.6° F. for a brief period. It is obvious that for the age group over 5 years, at all events, this method has its limitations.

Conclusions

It would seem, then, that where a routine Moloney test cannot be conveniently employed the prophylactic to be used should be T.A.F., which this series of observations suggests is only slightly inferior in efficiency to toxoid preparations, and which, in my hands, has never produced a local or general reaction in a child of 10 years or under.

For institutional work, where Moloney testing is possible, formol-toxoid would seem to be the prophylactic of choice, and the above observations indicate that a high percentage of successes can be obtained with this antigen (in four weeks) after a course of two injections.

In this experiment the alum-toxoid preparation used did not compare favourably with formol-toxoid, or even with toxoid-antitoxin floccules, and its tendency to produce local redness is a contraindication to its general use outside institutions.

I wish to record my grateful thanks to my former colleagues, Dr. C. W. Anderson, Dr. Jean W. Smellie, and Dr. J. D. Spillane of the Cardiff Public Health Department, who helped with some of the testing and immunizations above referred to. I must acknowledge also the very great assistance given, in a variety of ways during this investigation, by the Epidemic Officer of that department (Mr. F. Davey).

TREATMENT OF BED-SORE WITH ELASTIC ADHESIVE PLASTER

BY

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The following method of treatment of bed-sore has, in my practice, shortened the time of healing, lessened the labour of the attendant, and diminished the need for skilled nursing. It has been tested in a total of ten cases, in one of which sixteen weeks' treatment with the usual remedies had failed to improve the condition.

Two pieces of elastic adhesive plaster, one over the other, are applied so that the bed-sore and the skin surrounding it for at least an inch are covered. If the bed-sore has a greater diameter than the elastoplast bandage two pieces may be laid side by side and held together by two other pieces placed at right angles. The elastoplast is left in position as long as it will adhere—usually, in the early stages when discharge is plentiful, twelve to forty-eight hours. It is then replaced by similar pieces of adhesive plaster, and this is repeated until healing is complete. On removal of the bandage no attempt should be made to clean the surface of the sore; it suffices to wipe away the discharge from the surrounding skin with cotton-wool or soft cloth before applying a new piece of bandage. Elastoplast was used in the following cases.

Case I

A man, aged 72, with left hemiplegia, had a bed-sore two and a half inches in diameter on the left buttock. Acriflavine gauze dressings were applied to the ulcer, and the surrounding skin was treated with methylated spirit and powder (starch, zinc oxide, and boric acid). At the end of five weeks the ulcer was almost three and a half inches in diameter. A well-padded tow-ring placed round the ulcer to release the pressure had to be abandoned in less than a week because of discomfort. During eleven subsequent weeks B.F.I. powder was used instead of acriflavine. Extra powder was dusted on according as the surface became moist, and the whole was cleaned off gently every morning. The ulcer did not increase in area, but the edges became raised and unhealthy-looking.

Elastoplast was then tried. The first dressing remained on for about thirty hours; on removal the ulcer base was pink, and its edges were flat and clean. Elastoplast was reapplied four times at lengthening intervals, and on the twelfth day the site of the ulcer was covered with firm skin. Methylated spirit and dusting powder were used twice daily thereafter. There was no return of the bed-sore. Pulse rate and temperature were normal for the duration of the elastoplast treatment.

Case II

In this case, that of a woman, aged 86, who had gangrene of the right foot and was delirious each night, a bed-sore on the left buttock about three inches in diameter had been treated for five days with an ointment containing zinc oxide, castor oil, and tinct. benzoin. co., without improvement. Elastoplast was applied on the sixth day, and healing was complete seven days later, although the patient was steadily losing ground.

Case III

A woman, aged 63, with rheumatoid arthritis, had a bed-sore about one inch in diameter over the lower end of the sacrum. The usual remedies had been used for about a week with little benefit. Elastoplast treatment was then instituted, and resulted in cure of the sore in five days.

The patients in these cases were cared for night and day by experienced and fully qualified nurses. Seven other patients, having various primary disorders, were treated for bed-sore with elastoplast, but nurses were not in attendance. The time taken for healing was from seven to fifteen days. There was no increase in temperature, and the pulse rate was always below 100. (Case II was

the only one in the series in which the temperature was raised, and it is supposed that the primary condition accounted for it.)

Commentary

It was noteworthy in these cases that little, if any, visible damage was done to the surface granulations during the removal of the bandage. After the first or second bandage had been used the ulcer base was almost invariably clean and healthy in appearance. This contrasted strongly with the bleeding surface seen when changing the acriflavine dressing, and the raised, indolent edges following application of B.F.I. powder in Case I. It is manifest that some amount of protection of the capillary loops is necessary for the healing of all cutaneous sores, but more particularly is this so in the case of "nutritional ulcers," to which type bed-sores belong. The granulations may be injured not only by the act of removing a dressing which is adherent to the ulcer base, but also by friction caused by the dressing in position. These sources of injury are obviated when elastoplast is used, the former by reason of the discharge which separates the ulcer from the bandage, and the latter by the bandage being adherent to the surrounding skin and, in consequence, not movable on the ulcer surface.

It seems to me that the retained discharge has considerable proteolytic power, and that it helps to liquefy the necrosed tissue on the base and about the edges of the ulcer, and to remove it. In addition, epithelial proliferation proceeds at an extraordinarily rapid rate, though whether this is due to stimulation or opportunity it is difficult to say. It may be, therefore, that certain biological and chemical properties of the discharge are responsible for these effects, and are the main factors in the production of the good result, but in the absence of proof that this is so I prefer to stress the physical advantages of its presence.

Ordinary non-elastic adhesive plaster was not tried because it cannot be applied accurately to rounded or irregular surfaces—for example, the elbow, heel, shoulder-blade. Its edges are sharp, and it wrinkles unless the part is immobilized. The following objects are served by the use of two-layered plaster: (a) the discharge does not readily soak through; (b) the two layers, plus the discharge over the ulcer, serve as an effective cushion, protecting the granulations by distributing pressure; (c) where incontinence of urine or faeces is present the ulcer surface is less readily contaminated from this source.

Itching under the bandage is usually complained of, and much attention is required to keep the patient from scratching the bandage off. In my experience itching has never been so pronounced as to demand cessation of this form of treatment.

Summary

Ten cases of bed-sore were successfully treated by the application of elastoplast dressing. Fifteen days was the longest time taken for healing, and no case proved intractable. No systemic reaction, due to retention of discharge about the ulcer, was observed. The application of elastoplast in two layers is advised.

The Birmingham City Council, which two years ago by a small majority declined to sanction a public birth-control clinic, reconsidered the matter on January 8th, and by a majority of five approved the principle of providing lawful facilities for giving advice and instruction in contraceptive methods to married women. This was to be limited to cases where pregnancy would be detrimental to health. The resolution instructed the Public Health Committee to report upon the appropriate means of providing such facilities.

Clinical Memoranda

Idiopathic Torsion of the Omentum

Torsion of the omentum, with its accompanying pathological cause, as in umbilical hernia, is comparatively common; but torsion of the omentum in the absence of any such cause is perhaps sufficiently rare to justify the recording of the following case.

CASE RECORD

A farmer, aged 42, 6 ft. 2 in. in height and over 15 st. in weight, was seen on June 2nd, 1934. The family history was unimportant, and he did not remember any illness sufficient to keep him in bed for a day, though at times he had had slight indigestion and occasionally flatulence after meals. On the previous day, while at work, he had suddenly been attacked with severe abdominal pain, not attributable to any undue strain or muscular effort. The pain, which was very severe and gripping in character, commenced in the upper abdomen, but later became localized on the right. He had vomited once, and had one small action of the bowels, after which he had been unable to pass either stool or flatus. His temperature was 99° F., and his pulse rate 96. From his general appearance there was no doubt that he was suffering acute pain. He lay very still, and all abdominal movements were reduced to a minimum. There was no evidence of hernia. The abdomen was distended and there was general tenderness on palpation, the area of greatest tenderness being the right upper quadrant. Pressure over the left side induced pain on the right side, and the area of least tenderness was in the left lower quadrant. There was general abdominal rigidity, but most marked over the middle third of the right rectus muscle; the whole abdomen was resonant to percussion. There was no area of hyperaesthesia. A diagnosis of acute appendicitis with an abnormal position of the appendix was made, and an immediate laparotomy was decided upon.

Operation.—Under anaesthesia the abdomen was again palpated; on the left nothing could be felt, but on the right the hypogastric region felt empty, and there was a definite fullness over the right upper quadrant, where an ill-defined swelling was detected. An acute intussusception now seemed probable, so the abdomen was opened by a right paramedian incision. On opening the peritoneum a little blood-stained free fluid was noticed. The caecum was pulled upwards, and both caecum and small intestine were distended; the appendix was normal; the transverse colon was collapsed. When the hand was passed into the abdominal cavity a soft mass was felt in the right upper segment, adherent by very fine adhesions to the parietal peritoneum and the under surface of the liver. When the adhesions had been freed the mass, composed entirely of omentum, was easily brought outside the peritoneal cavity, and was found to be attached by a pedicle with five distinct turns. This pedicle was securely ligatured and divided and the omental mass removed, thus relieving the obstruction. The abdomen was sutured in layers without drainage. Except for some ether bronchitis, which caused anxiety for a few days, the patient made a good recovery.

The mass removed was 11 in. long and 8 in. round its thickest part. The pedicle was 1½ in. in length, and had five distinct turns in a clockwise direction when viewed from the cut end. It consisted of more than half of the omentum. On section there was no sign of any cyst or growth, but the whole mass was engorged and oedematous.

The causation of omental torsion has been fully discussed at one time and another in the literature on the subject. In this case a massive deposit of fat in the omentum was probably responsible for the initial twist, and the process later accentuated by the engorgement and oedema following the first turn.

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