KAOLIN IN THE TREATMENT OF EXTERNAL GASTRO-INTESTINAL FISTULAS

FRANK CO TUI, M.D.
OF NEW YORK, N. Y.

THE types of fistulas considered in this report are the spontaneous gastric and duodenal fistulas and such artificial fistulas as ileostomy, cecostomy and sigmoidostomy.

It is generally known that the continual discharge from fistulas of the gastro-intestinal tract causes pathologic changes of the surrounding skin, varying from a mere redness for a short distance around the wound to an extensive raw-looking area. The degree of excoriation and digestion seems to bear a definite relation to the enzymatic activity of the fistulous portion of the gut, the intensity being greatest in fistulas of the upper digestive tract, less in those of the right half of the colon and least in those of the left half of the colon. In some cases of duodenal fistulas the entire abdominal wall may be involved, presenting a beefy surface with the recti muscles standing out raw and bare.

Of the artificial fistulas, ileostomy presents the most difficulties in management because of the inevitable digestion occurring around the stoma. In those cases in which the ileum is drawn out into the main incision and opened immediately, the digestion around the wound may be so marked as to lead to evisceration under the least strain. In cecostomies, digestion may be quite as severe as in ileostomy, and in sigmoidostomies, there is little or no excoriation unless diarrhœa occurs. But aside from the discomfort these lesions cause, they prolong the patient's stay in the hospital by postponing the closure of the artificial anus where a closure is intended.

The use of such preparations as vaseline, zinc oxide ointment and other oleaginous substances as a protective for the skin, although recommended by many authors, is not only futile but actually harmful. They make the wound "messy" and retain the discharge and thus promote further digestion. The discharge seems to have a malignant propensity to lift up the vaseline layer and to burrow under it to get to the underlying skin. The same objection applies to paraffine, parresine and collodion.

It is not generally known that kaolin, in addition to being an internal medicament for various gastro-intestinal disorders, is also of benefit when used as a dressing in these cases. The power of kaolin to inhibit enzymatic activity was demonstrated by Petersen [1] in 1917. He found that on mixing .2 gm. of kaolin with 7.5 c.c. of duodenal and upper jejunal contents the rate of proteolysis was reduced by about 20 per cent. This figure is not impressive at first sight, but when the relatively small quantity of kaolin is considered, its marked anti-enzymatic activity is at once apparent. Smith and Christensen,[2] in testing out different substances that would tend to inhibit enzymatic activity in the discharge from intestinal fistulas, found that kaolin and charcoal

were the most useful. Because of the objectionable color of charcoal, they preferred kaolin. They used sterile kaolin in the form of a paste made with glycerine. After applying the paste, they surrounded it with kaolin powder.

In the hope that the absorptive power of kaolin, as demonstrated by Petersen, might be beneficial in artificial ani around which there was digestion, we started using it in 1926. The results encouraged us to extend its use to high fistulas. Our experience covers thirty-one cases, which may be tabulated as follows:

Four, duodenal fistulas; five, ileostomy—through stab wounds; three, ileostomy in main wound (infants with atresia of colon); four, cecostomy; fifteen, sigmoidostomy. We prefer the powder form as being simpler, more soothing and more absorbent for moisture. It is not necessary to sterilize it. Hektoen and Rappaport [3] and Rappaport [4] showed that when properly applied in a dry powder, kaolin removed not only diphtheria bacilli but practically all bacteria of the nose in the course of three or four days. It must be cautioned that crude kaolin is moist and lumpy and has less adsorptive power than the thoroughly dried and powdered product. At present, however, the commercial houses put out a very high grade of product, so that one does not have to resort to drying and powdering and sieving it, as Rappaport had to do. Kaolin should not be used in the small amounts in which the ordinary dusting powder is used, but literally be heaped around the opening and over it. The caking that occurs does not offer any impediment to the free flow of the discharge. Immediately upon application the smarting and burning stop. The angry appearance of the part is soon lost and healing takes place rapidly.

In the treatment of the high fistulas, oil tampons [5] and irrigation with sterile water have been tried with unconvincing results. The use of atropine and sodium fluoride to inhibit the secretions is of little value.[6] Johansen [7] injected 1 per cent. citric acid into the fistula and reported favorable results in two cases, and recently Potter [9] has advocated the treatment of the various external intestinal fistulas with beef juice and dilute hydrochloric acid. The removal of the discharge by aspiration was advocated by Jones and Williams.[8] Erdman,[10] in 1921, devised a continuous suction pump which proved successful in the healing of a traumatic duodenal fistula. Cameron [11] reported a favorable result with the use of his electric pump, and Lahey [12] two cases in which the use of his continuous water suction pump resulted in prompt healing. In our four cases of high fistulas we have obtained excellent results by the use of this method of continuous suction with a liberal application of kaolin powder around the wound. The kaolin powder prevented digestion from an overflow of the discharge and hastened the healing of the digested areas.

In our five cases of ileostomy in which the ileum was drawn out through a stab wound, little or no irritation was encountered. In the three cases of infants, on whom, because of the critical condition of the patients, the ileum was brought out into the lower corner of the main wound and opened immediately, two had a slight infection and one had a severe infection, but digestion was controlled and evisceration was prevented. When one considers that

a large majority of these patients die as a result of evisceration the prevention of this almost always fatal complication in three consecutive cases was extremely gratifying.

The same good result was duplicated in our four cases of cecostomy and fifteen cases of sigmoidostomy. The powder was applied as soon as the externalized knuckle of bowel was opened. A slight reddening of the skin was found in one case of cecostomy. This was due to the use of kaolin in insufficient amounts and was soon remedied when liberal quantities were applied. In the fifteen cases of sigmoidostomy no irritation occurred. In one case in which the artificial anus was made immediately in the operative wound, and in which an infection was thought inevitable, we had the pleasure of seeing the wound heal by primary union. In all these cases of artificial anus kaolin undoubtedly shortened the patients' hospital stay at least two weeks.

SUMMARY

1. Kaolin is recommended as a dressing in cases of external gastro-intestinal fistula.
2. It need not be made into a paste. The powder is simpler, more soothing and more absorbent and adsorptive. It is not necessary to sterilize it.
3. It should not be used in the quantities of an ordinary dusting powder, but liberally applied.
4. It prevents irritation and digestion of the wound by the discharge, relieves burning and smarting and insures prompt and uninterrupted healing.
5. The use of vaseline and other oleaginous substances is harmful.

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