

neath the cord, is the fear of a possible traumatism to the cord, which might cause interference with the nutrition and function of the testicle.

The question whether the transplantation of the cord is necessary in the radical cure of inguinal hernia, I have previously discussed.¹⁰

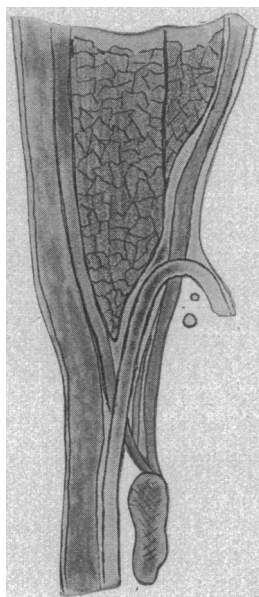


Fig. 6.—Sectional drawing of relations in Fig. 5, showing descent of internal ring.

Repair of the internal ring with a consequent elevation of the cord to its normal position can hardly be considered a transplantation of that structure.

In conclusion: I would emphasize the repair of the internal ring by suture of the transversalis fascia beneath the cord, which causes both minimization and elevation of that structure, with the attachment of the internal oblique muscle to the outer two-thirds of Poupart's ligament, so that it covers and protects the repaired internal ring. The above details cause a relationship which results in a valve-like formation of the inguinal canal, which is important in preventing recurrence. These steps should be preceded by the removal of the sac at its neck, with the redundant

parietal peritoneum, and followed by the reunion of the divided external oblique aponeurosis, and the formation of a suitable external ring.

THE MANAGEMENT AND TREATMENT OF A CASE OF INFECTION BY THE BACILLUS TYPHOSUS *

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In consideration of the prevalence and mortality rate of typhoid, as ordinarily treated, I desire to present a method of management in this infection which promises to reduce the mortality to a large extent.

The most constant objective symptom of infection is fever, and it has been considered the physician's duty to combat it at all hazards. The use of the coal-tar antipyretics, however, was followed by an increased mortality rate, while the Brand method, founded on the idea that fever should be lessened, if possible, does not, I believe, materially lower the mortality rate. A consideration of the complex of symptoms which we call fever leads me to believe the rise of temperature in fever to be, as Bunge says, "one of the processes of self-protection and regulation of which we have so many examples in the body." On the assumption that fever is a physiologic effort at self-defense, the physician can surely occupy himself with something better than attempts at dulling this valuable weapon.

A case of typhoid infection presents pre-eminently a picture of toxemia; the trembling tongue, the slow cerebration, the diarrhea with anorexia and insomnia,

all point to profound intoxication produced by the toxins set free by the disintegrating bacilli. If the individual lives, he will have established immunity to the bacillus in from three to five weeks. The physician at present possesses no drug or combination of drugs capable of destroying the bacteria or of hastening the immunizing process. Writers in current medical literature concern themselves chiefly with devising methods of lowering the temperature, but not a single writer, so far as I know, has suggested a plan for lessening the toxemia which is the sole cause of the patient's rise of temperature.

In my experience with the Brand method, in the absence of bath facilities, I had to resort to the application of bath towels saturated in water inversely proportionate to the temperature of the patient. The clearing up or non-appearance of delirium, the lessening of diarrhea and tympanites, and the improvement in sleep and digestion, really due to lessening of toxemia, I attributed at first to the antipyretic effects of the bath, which, however, seemed out of all proportion to the insignificant lowering of the temperature. But a series of cases in women and children, who refused the cold towelings, compelled me to compromise by warmer but more frequent baths. To my surprise, these patients did much better than those who had received the cold toweling. This led me to formulate a method of treatment that includes, first, the water supply necessary; second, a regular elimination of toxins, and, third, the food supply—these being, to my mind, the fundamentals of successful treatment of a patient with typhoid infection.

The method is briefly this: As soon as a diagnosis is made with reasonable certainty a calomel purge is given at bedtime and is followed with a saline cathartic next morning, not with the idea of modifying the infection, but for the purpose of clearing the intestinal tract of particles of undigested and fermented food, for during the prodromal period of the disease most of these patients eat food that they can not digest.

The baths are now instituted at once without reference to the patient's temperature. The bath is first given at 7 a. m. and repeated regularly every two hours during the day until 9 p. m., unless the patient is restless, when the last bath is given at 11 p. m. Immediately preceding each bath the patient is required to drink from four to eight ounces of water, and immediately after each bath he is required to sip slowly from two to six ounces of milk, the amount depending largely on the appetite of the patient.

TECHNIC OF THE BATH

One-half of the bed is covered with any material (an ordinary quilt, folded once, answers the purpose perfectly), the patient's nightgown is removed and he is moved on to the covered portion of the bed. Two large bath towels are then saturated in a bowl of water of the required temperature; the patient is told to extend the arms parallel with the body, and the anterior surface of the body is covered with the towels that have been slightly squeezed—not wrung—when taken from the water. The towels are allowed to remain for three minutes; then they are removed, rewetted, and the process is repeated on the posterior surface of the body. The patient's body should be entirely covered from head to heel, the towels overlapping somewhat in the middle of the body. The whole process, including time spent

10. Connell, F. Gregory: *Am. Jour. Med. Sc.*, March, 1905.

* Read before the Military Tract Medical Association, Oct. 15, 1908.

in giving water before the bath and milk afterward, should occupy about twelve minutes. If the patient complains of chilliness following the bath he may have a hot-water bottle and some extra cover for fifteen or twenty minutes, and if the chilliness is not relieved in this time it is best to raise the temperature of the water used in the bath.

These baths should be continued in this manner and time until the patient seems on the point of achieving his immunity, as evidenced by a marked fall in temperature, an ability to take solid food, the occurrence of a formed fecal movement, a normal tongue, etc. Then they should be given every three hours, and after the temperature has been normal in the evening for two or three days they may be discontinued, unless the disease should later show signs of recrudescence, when they should promptly be again instituted.

CONTRAINDICATIONS

The only contraindication I have recognized is the occurrence of severe intestinal hemorrhage. The baths should then be stopped for a few hours, until it appears that the hemorrhage is controlled, when they should be resumed. The temperature of the bath for a robust adult should be about 60 F., and for most women and all children from 20 to 30 degrees higher. When the reaction is delayed more than ten minutes it is too cold and the temperature should be raised.

ADVANTAGES OF THIS SYSTEM OF BATHING

The baths are as practicable in the humblest home and as readily given there as in the best appointed hospital. They do not require the ministrations of a trained nurse. Any fairly intelligent woman can learn the method in fifteen minutes, and a little criticism on the part of the attending physician will render her work perfect in the first few days of the case. This contrasts strongly with the Brand system, the appointments for which were scarcely obtainable outside of a hospital. And really less than 0.5 per cent. of patients ever received this treatment on account of lack of facilities.

PURPOSE AND EFFECT OF THESE BATHS

These baths have little or no effect on the temperature, but there is every clinical evidence that they do eliminate the typhoid toxins. A patient who receives these baths regularly from the time of diagnosis will not develop troublesome diarrhea, delirium and insomnia. I always leave orders that the patient must have his bath on time, even if it is necessary to wake him, because I am certain that he will have no trouble subsequently in getting all the sleep he needs. I believe the elimination of toxins takes place through the skin.

These baths shorten the period of immunization to three weeks or less in the great majority of cases, but do not, in my opinion, lessen the tendency to loss of immunity or what is generally termed a relapse. If this occurs the baths should be promptly resumed, and the relapse usually runs an exceedingly short and mild course.

MEDICINE AND DIET

The only drug administered is copper arsenite, 1/100 gr., dissolved in half a glass of water and taken four times a day, for the purpose of precipitating the toxin in the intestinal canal. Alcohol should not be given, either as a food or as a medicine, as it interferes with the physiologic activity of the phagocyte, the most important factor in the immunization process.

By lessening toxemia this method tends to prevent hemorrhage, and if perforation occurs the patient is in better condition to stand an operation than under customary methods of treatment.

Milk, I believe, is the best food. If it disagrees I lessen the amount and cause it to be sipped slowly, or, if necessary, buttermilk is substituted. Bread and butter may be given after the second week if the patient desires solid food, but previously to that time even liquid mixtures containing starch should be avoided, as the patient is not likely to be able to digest them. The condition of the mind should be considered in regulating the diet, for a patient with a normal sensorium is much more likely to digest food than one who is in a low muttering delirium. I believe that the majority of patients are fed too much during the first week, for their power of assimilation at this time is at its lowest. Some fruit juices should be allowed, avoiding the citrus fruits, however, during the early stage of the disease.

The patient should be instructed to wash the mouth and teeth two or three times a day with a mild alkaline solution. I use a Carl Seiler tablet dissolved in half a glass of warm water.

RESULTS

Now, do results justify this method? During the period from 1898 up to the present time ninety-seven cases of typhoid have come under my care, and during the eleven years I have been using this method the mortality has been absolutely *nil*.

This experience extends over such a long period of time it must of necessity have included cases of almost every degree of virulence. And I believe that the merits of any method of treatment must be judged by a time test as extensive as this one. We all see epidemics of this infection so mild that the patients practically all recover, no matter what the treatment; while other epidemics are so virulent that the mortality is as high as 40 or 50 per cent. These facts have been borne in mind, and after eleven years' experience with the method that I have placed before you to-day I firmly believe that I am justified in making the assertion that this is the ideal treatment for typhoid fever: first, because it is founded on physiologic principles capable of demonstration; second, because it is practicable with all patients and under all circumstances; third, because results are all that could be desired.

COMPLEMENT FIXATION IN MALIGNANT DISEASE

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In a recent paper published in conjunction with Dr. W. S. Thomas,¹ I have pointed out that the blood serum of cancer patients may contain a substance or substances which, in the presence of cancer extract, will bind a larger amount of complement than the blood serum of normal individuals. It was found that this reaction could be obtained in about 65 per cent. of the cancer cases, while it was absent in 98 per cent. of our non-cancerous patients and in all normal persons. The small number of positive results in non-malignant cases finds its probable explanation in the fact that cancer

1. Simon, C. E., and Thomas, W. S.: Complement Fixation in Malignant Disease, Jour. Exper. Med., 1908, x, No. 5, p. 673.