Nutrition in Diseases of the Colon and Rectum

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SINCE the colon and rectum are important components of the gastro-intestinal tract, it is inevitable that alterations in their function will result in nutritional disturbances. The nutritional status of the patient is one of the most important factors in determining the outcome of any medical or surgical program of treatment.

The question of how best to correct sub-standard nutritional states has received considerable attention. There are two routes for the administration of supplementary feeding—intravenous and oral. In recent years, most emphasis has been directed toward the intravenous route; however, few will disagree with the statement that the oral route, if it can be used, is preferable. Natural whole foods such as meat, vegetables, eggs, milk and fruit are excellent sources of proteins, fats, carbohydrates, vitamins, minerals and other essential nutrients. Good tolerance is readily predicted because the gastro-intestinal tract has already long been accustomed to the handling of these natural foods.

Intravenous alimentation, in addition to being expensive and uncomfortable, suffers from the great disadvantage of requiring a maintenance caloric requirement before the protein which is taken will be used for protein functions such as growth, wound healing and hemoglobin formation. If this basic caloric requirement is not satisfied, the protein will be used for this rather than the all-important protein functions. All too frequently, the basic caloric requirement is greatly increased in diseases of the rectum and colon because of infection, diarrhea, fever, malignancy, fistulæ, ulceration or loss of function.

Since 1951, we have used liquefied natural foods for tube feeding [1, 2, 3]. The tubes used for the most part are small, plastic, inexpensive, non-irritating and may be readily passed into the upper gastro-intestinal tract of almost every patient (Fig. 1). The stomach is used where possible. However, the tube may be passed into the upper jejunum if necessary by means of a silk string and mercury-weighted balloon (Fig. 2). Plastic tubes are tolerated better than rubber tubes.

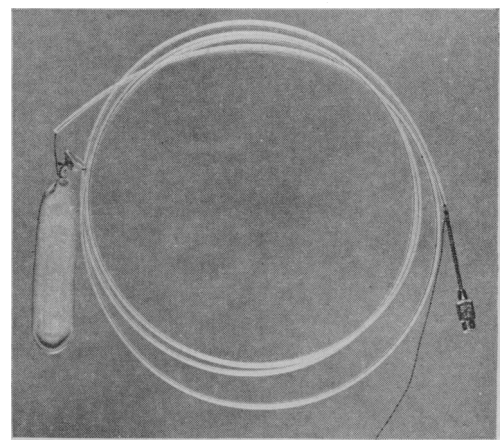

FIG. 2.—Polyethylene tube with mercury-weighted balloon tied to silk string, passed through lumen of tube and held in place at other end of needle. This enables the tube to be passed to the upper jejunum which is sometimes necessary in colon surgery.

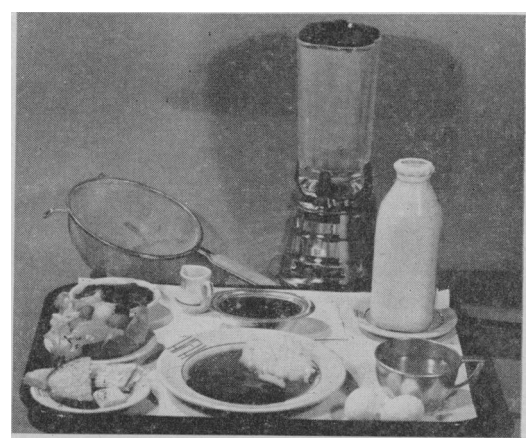

FIG. 3.—Tray of food and kitchen blender. Note eggs to replace the protein lost by straining through the special fine mesh strainer.

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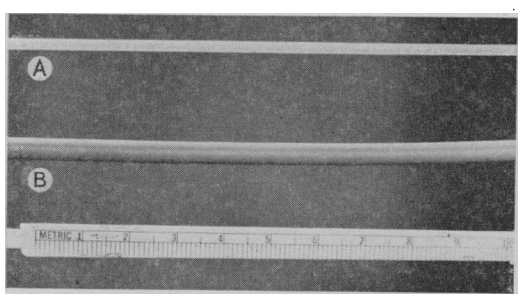

FIG. 1.—Polyethylene feeding tube—2·4 mm (A) as compared to regular rubber stomach tube (B).

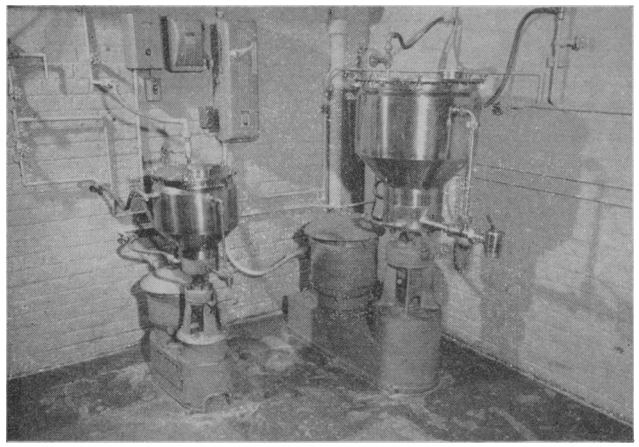

FIG. 4.—Colloid mills for large scale liquefaction of natural foods. These have been in extensive use at the Henry Ford Hospital since 1953. The food particle size may be regulated as desired.

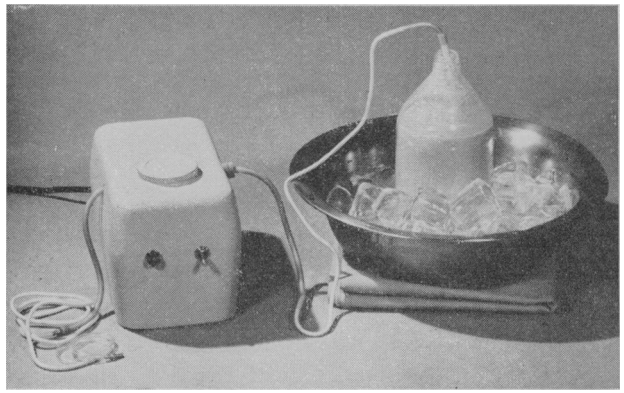

FIG. 5.—Food pump with adjustable speeds. Liquefied natural food is kept in ice.

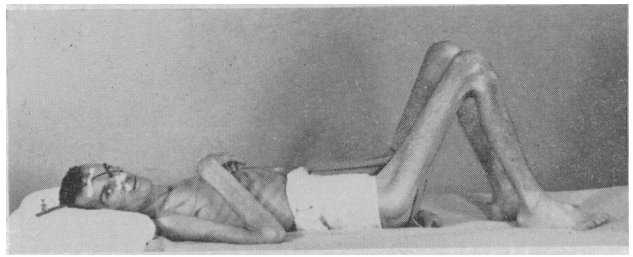

FIG. 6.—Patient with extreme malnutrition following ileostomy and colectomy done elsewhere. Partial obstructions were found in the third part of the duodenum (superior mesenteric vessels) and at the ileostomy stoma. A jejunal tube was passed into the upper jejunum and he was fed through a stomach tube. The residual gastric aspirate was collected every three hours and pumped through the jejunal tube. The ileostomy stoma obstruction was treated by the use of a small soft catheter.

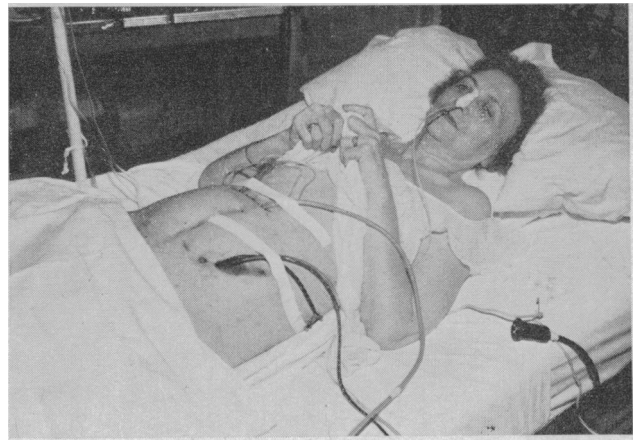

FIG. 8.—Patient with multiple draining fistulae from diverticulitis in sigmoid and at site of colostomy closure. Fever and drainage persisted until the patient was fed 6,000 to 7,000 calories daily through tube. The granulation tissue quickly changed from inactive greyish-white to a proliferating healthy appearance with complete healing.

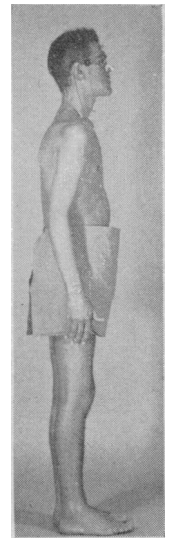

FIG. 7.—Same patient after weight gain of 75 lb. in two months by tube feeding with liquefied natural foods. An ileorectostomy was carried out with no difficulty.

The natural foods, in addition to being the best tolerated, contain ample sources of protein and calories and are less expensive than any manufactured feeding preparation (Table I).

TABLE I

	Amount	*Protein* grams	*Calories*
Milk	1 quart	35	700
Egg (whole)	One	6	75
Beef, ham	2 oz.	14	145
Peas	2/3 cup	5	91
Baked potato	1 medium	2	98
Sugar	1 tbsp.	—	58
Ice-cream	1/3 cup	3	145
Powdered fat-free milk	17 oz.	178	700
Banana	One	1	88

Food to be used in tube feeding has to be liquefied in order to pass through the small feeding tubes. We have utilized several methods for doing this [4]: strained baby foods (meats, vegetables and fruits), kitchen blenders (Fig. 3) and large comminuting or colloid machines (Fig. 4). At the Henry Ford Hospital, we have used the large machines for some time and produce about 14,000 liters of liquefied natural food each year. In using kitchen blenders all bones and seed must be removed and the machine must be allowed to run for at least five or ten minutes. After this, the material must be carefully strained through a fine mesh wire gauze strainer to prevent plugging the small tubes. This straining will remove 5 to 12% of the protein present. Commercially prepared strained baby foods are excellent sources for tube feeding material and are quite inexpensive when compared to commercially prepared intravenous solutions.

Mechanical pumps [5] to deliver the food at a slow constant rate are almost a necessity (Fig. 5). Since the food is chopped into such fine particles and the delivery rate is slow, digestion takes place well and this is most important where natural digestion is impaired. Advantage must be taken of every measure to assist digestion and absorption to increase caloric and protein intake. Gravity drip and syringe injection in general are not satisfactory for tube feeding purposes and especially is this true in critically ill patients and where diarrhea is part of the disease.

For tube feeding, most patients are more comfortable if the feeding mixture is kept reasonably close to that ordinarily eaten. With tube feeding, individual taste is no problem. Sufficient fluid must be added to insure adequate urine output. In many patients, 5,000 to 8,000 calories will be necessary to meet the greatly increased caloric requirements in diseases of the colon and rectum (Figs. 6, 7, 8). Sedation is necessary for some patients and especially in ulcerative colitis.

The restoration of nutritional balance can produce dramatic effects in the patient's will to live and healing ability (Figs. 6, 7, 8). As time passes, we are more and more convinced that tube feeding with natural foods will make the patient ready for surgery and, in many cases, prove to be a life-saving measure in the post-operative period.

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Electrolyte Problems in Chronic Ulcerative Colitis

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PROBLEMS in electrolyte balance in chronic ulcerative colitis may occur during the medical management of the disease, the pre-operative preparation of the surgical patient, and in the post-colectomy period.

The gastroenterologist may encounter severe depletion of sodium, potassium, and chloride together with dehydration due to diarrhea. Reduced fluid intake often induces an iron deficiency anemia which may be slow in responding to iron therapy. Severe loss of nitrogen in the feces with lowered protein levels may be reversed by the institution of steroid therapy. It is not advisable to use steroid supplementation in the face of marked electrolyte imbalance, and certain anabolic protein agents such as testosterone propionate and norethandrolone should be tried first.

When colectomy and ileostomy are indicated, several factors regarding fluid and electrolytes should be recognized.

Dehydration in the absence of a renal defect will not occur if 800 to 1,200 c.c. of urine are excreted in a twenty-four-hour period.

Renal function should be ascertained pre-operatively as malfunction will markedly alter electrolyte values.

Circulating blood volume may give misleading electrolyte values unless corrected. When replacing blood in the arteriosclerotic patient, care should be taken not to overload the circulation and cause right heart failure.