certainly possible to improve the results of medical treatment in our present state of knowledge. First the diagnosis of ulcer should be established as early as possible after symptoms begin and thorough treatment with bed rest should be given at the onset; how rarely does one see a patient in a hospital bed with an ulcer history of less than a year? It is in this respect that our professional colleagues so often have the advantage over the hospital patient.

Secondly, the diet prescribed should be palatable; in spite of dietitians how many hospitals can be said to provide this? Moreover, some attempt should be made to instruct not only the patients themselves but also their wives in the methods of preparation of such a diet.

Finally, the social circumstances of the patient must be considered and every help given to enable him to adjust himself to the difficulties and responsibilities of his daily life.

The Editor much regrets the omission of the full caption to Fig. 11 in Dr. Sherlock's important article on 'Cirrhosis of the Liver' in our September issue. The illustration is reproduced in full on page 595 in the present issue.

ANNOTATION

The Milk Drip

Since Winkelstein (1932) first introduced the continuous alkalized milk drip for the treatment of peptic ulcer, this method of therapy, with certain modifications, has enjoyed increasing popularity. Not only has it been widely adopted in the management of the dyspepsias, but also as a means of feeding in certain cases of injury or disease of the mouth or pharynx. In a number of conditions of nervous origin as well as in certain forms of renal disease it has proved a life-saving measure.

The basis for Winkelstein's introduction of the milk drip in the treatment of peptic ulcer rested upon his observation that night sampling of the resting gastric contents in cases of gastric and duodenal ulcer showed abnormally high curves for both free and total acid. In duodenal ulcer, especially, a high continuous curve was obtained. He subsequently showed the absence of free hydrochloric acid in such cases during milk drip treatment and concluded that the method is a logical

and practical means of producing constant achlorhydria.

Subsequent experience has proved the value of Winkelstein's method of treatment, but in recent years more concentrated modified milk mixtures fulfilling calorie, vitamin and electrolyte requirements have been devised. Details of five such diets will be found elsewhere in this issue. The main advantage of these fortified milk mixtures is that a completely balanced diet can be administered in a volume of 3 or 4 pints and that patients may be fed by continuous intragastric drip for an indefinite period.

The original alkalized milk drip had certain disadvantages, namely that it was difficult to achieve a gain in the weight without giving huge quantities; that a vitamin deficiency—especially of ascorbic acid, so important in the healing of ulcers—and an anaemia were prone to develop; and, finally, that the large intake of alkali was not without risk.

The apparatus consists of a suitable container with rubber tubing, an adjustable clip and a blood transfusion drip chamber. The clip is adjusted to deliver about 30 drops a minute. A Ryle's tube is

commonly employed but fine-bore polythene tubing with an internal diameter of about 1 mm. is far superior. It is easier to pass than a Ryle's tube and the nasal route is always to be preferred. Polythene tubing causes no discomfort and may be left *in situ* for days and even weeks without removal. Being so thin but comparatively rigid, it is unlikely to be expelled during retching or vomiting, but owing to its greater liability to pass down the trachea, care must be taken to ensure that it is in the stomach by gastric auscultation during the injection of a small volume of air (Bull, 1950). Polythene tubing is secured to the apparatus by a wide-bore needle which fills the lumen of the tube snugly and is connected to the delivery tube by means of a record adaptor.

It is fair to state that any patient with an active duodenal ulcer will respond at least as well to a continuous intragastric drip as to any other recognized form of medical treatment. Provided a patient's co-operation can be enlisted, treatment by the milk drip is simpler; it entails less work for the nursing staff; it reduces the strain on the diet kitchen and brings the patient the maximum benefit of conservative treatment in the shortest possible time.

Its use need by no means, however, be confined to hospital practice. Patients with chronic duodenal ulcer, and particularly those with night pain, who cannot afford long periods of hospital treatment, may derive great relief and improvement from a continuous simple milk drip of 1 to 2 pints during the hours of sleep. A co-operative and intelligent patient can easily provide for this in his own house, and in suitable cases should be encouraged to do so.

In hospital practice, having decided that a patient requires treatment by a milk drip—and the opinion is offered that any patient who requires in-patient treatment for an uncomplicated duodenal ulcer falls into this category—continuous drip feeding day and night should be instituted at once and maintained for three weeks. The total volume of fluid given in 24 hours and the type of mixed feed prescribed is determined by individual calorie requirements, whilst sedatives, antacids, vitamins and iron are added as a routine. If progress is satisfactory after three weeks, the drip

is discontinued during the day and bland two-hourly feeds with alkalis and perhaps antispasmodics are prescribed from 8 a.m. to 8 p.m. Drip feeding is maintained for the remainder of the 24 hours for a further three weeks, and at the end of six weeks from the beginning of treatment a night fractional test meal and barium meal are carried out. If clinical progress and tests are favourable, a post-ulcer regime is instituted.

Apart from the rapid relief of symptoms and the steady progress of healing that is evident in most cases treated by this method, it has been found that the early response to treatment by the milk drip possesses some diagnostic and prognostic value from the clinician's standpoint. Patients with uncomplicated duodenal ulcer, even when severely incapacitated by pain, are commonly relieved of symptoms within two to six hours. If pain is not relieved within 24 hours, any form of medical treatment will almost certainly fail. In such cases either a deep penetrating chronic ulcer which will never heal, or pyloric obstruction is likely to be present. In some cases a malignant gastric ulcer is responsible for failure of treatment.

Gastric and anastomotic ulcers may also be treated by the milk drip, and the relief of pain and the rapidity of healing of even large ulcers may be dramatic. The largest gastric ulcer the writer has seen, 2 in. in diameter on the X-ray plate, disappeared except for a tiny niche after six weeks' continuous drip treatment. The patient gained over a stone in weight during this period, and thereafter remained symptom-free although the ulcer later returned to its original size. At operation subsequently, a simple ulcer was removed.

Continuous intragastric drip treatment may be of value as a therapeutic test in the decision as to whether a large gastric ulcer is simple or malignant. A useful procedure in such cases is to precede three weeks' continuous drip treatment by gastroscopy; barium meal, fractional test meal, blood count and occult blood examinations and to repeat these investigations at the end of the period. A simple ulcer will always show signs of healing at the second examination. If an ulcer which is visible gastroscopically has shown no signs of healing with a two-view test on the above strict

regime, medical treatment will almost certainly fail. If the ulcer increases in size it is probably malignant. In either case, partial gastrectomy is the treatment of election. It is wise to remember that a malignant ulcer may occasionally appear smaller after treatment owing to filling of the crater by malignant tissue. Careful assessment of clinical progress and results of investigations should detect such cases. If doubt remains a further three weeks' treatment and investigations will decide the issue.

Finally, intragastric drip feeding has a place in the treatment of haematemesis. It has been found of value in ensuring an adequate fluid and calorie intake in patients with haemorrhage from gastric or duodenal ulcer. The risk such patients run is conditioned, perhaps, more by fluid loss, dehydration and inadequate calorie intake than by anaemia. Continuous drip feeding provides fluid, calories and electrolytes and renders a patient more capable of standing the ill effects of further haemorrhage. In addition, a continuous milk drip avoids frequent disturbance of the patient for hourly feeds. If polythene tubing is used instead of a Ryle's tube, it is unlikely to be vomited should further bleeding occur. In those cases where further bleeding is suspected, but in which vomiting has not occurred, the aspiration of fresh blood from the stomach may confirm the clinical impression.

Intragastric drip feeding in the treatment of

peptic ulcer sometimes fails. Such failure represents a clear indication for surgical treatment. The patient may fail to co-operate because he feels hungry or because the tube hurts him. If the doctor will take pains to explain the rationale of the treatment to the patient; if he will make sure that the calorie intake is adequate but will allow those who still feel hungry to satisfy the demands of their psyche by taking small placebo bland feeds by the natural route at meal times, and if he will use a polythene catheter instead of a Ryle's tube, there will be few cases of failure for which either the doctor or the patient will be responsible.

Winkelstein's contribution to the treatment of peptic ulcer has been considerable and many patients have cause to be grateful to him. A plea is entered for a wider recognition of the place of this form of treatment in the management of peptic ulcer. A certain guarantee of success awaits those who use it wisely, remembering that it is a patient, not an ulcer, they are treating and that a genuine effort to solve a patient's personal and domestic problems is a pre-requisite for this success.

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