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THE MEDICAL TREATMENT OF PEPTIC ULCER

BY

SIR EDMUND SPRIGGS, K.C.V.O., M.D., F.R.C.P.

Ruthin Castle

PART I

We are often asked by doctors for an account of the medical treatment for peptic ulcer followed in this clinic, and particularly of the diet. The last description of our methods was published by my colleague, J. H. Anderson, in 1929. Perhaps the chief advances since then are a greater variation of the food and the checking of progress by more detailed radiology, especially with the stria pattern, and by knowledge gained with the gastroscope. It is now more generally accepted than in former days that to allay symptoms is only a first step; and that the thorough treatment which we have long advocated and practised is needed for permanent relief. The elements of physical and mental rest, diet, and medication are all of importance; their relative value differs with different patients, but failure of any one of the four may hinder or prevent smooth progress. Other aspects of the subject, such as the pathology, symptoms, diagnosis, complications, and statistics, are not here dealt with.

General Principles

In 1906, in St. George's Hospital, I started to feed by the mouth, from the beginning, patients with gastric ulcer, including those with haemorrhage. The method was modified from that of H. Lenhartz (1906) (Haberman, 1906). Recovery and nutrition were better, and pain, anaemia, and recurrence of haemorrhage less, than in control cases treated by the older method of abstinence from food, with rectal salines and nutrients. Also the patients were more comfortable, nursing was easier, and the parotitis and mild acidosis that may occur with fasting treatment were avoided (Spriggs, 1907-11; Langdon-Brown, 1908-9).

The regime is intended, by the use of fatty foods and absence of condiments, to excite but little flow of gastric juice; and by simple protein foods, and especially egg albumen, to combine with as much as possible of the hydrochloric acid secreted. The natural tendency to heal, which can be observed experimentally in simple ulcers, is thereby aided. Lenhartz held that, after bleeding, acid juice was more likely to digest a new clot than gentle stomach movement to dislodge it, and he reported that his method had reduced by half the recurrence of haemorrhage in the Eppendorf Hospital at Hamburg. Wirsing (1905) reported that a fall in acidity on the treatment was usual, though absent in some who did well. The advantage of putting food in the stomach is also supported by the observations of Hunter (1928-9), who found that

unneutralized acid gastric juice delays clotting. The food is increased by daily or almost daily additions as regards both quantity and kind, so that the demands made upon the diseased organ are increased gradually. The caloric value rises fairly quickly in order to maintain nutrition.

While the original principles of rest, the nature of the first food, and the gradual increase are followed, the diet has become much modified by myself and my colleagues in the course of the years. A valuable addition was olive oil, suggested by Walko (1902) and Cohnheim (1904) and advocated by A. F. Hurst (1909-10) and myself (1910). All physicians are indebted to the work of their contemporaries, among whom in this subject should also be mentioned Bolton, Sippy, Ralph Brown, Eusterman (1938), Bastedo, M. J. Stewart, T. I. Bennett, and many others. Meulengracht (1933) has recently reaffirmed the principle of immediate feeding for ulcers, especially in cases with haemorrhage, and has set forth anew the arguments for, and the good results of, early feeding. The method is also supported by the observations of O. Christensen (1934) on the movements of the empty stomach.

The regime here described has therefore, with variations, been the basis of the treatment of my cases for some thirty-four years. Similar treatment has also been given successfully in cases of suspected early ulceration, duodenitis, and some forms of gastritis.

In 730 patients with peptic ulcers in this clinic the diagnosis has been established by suitable examinations, including radiographs and test meals; except that if there is haemorrhage a test meal is omitted and x-ray examination postponed. If septic foci are revealed their removal, when possible, is a preliminary measure. The patients were sent by doctors, and most of those in whom the diagnosis had been made before admission had already received treatment, while up and about, by careful diet, milk between meals, alkalis, and sometimes olive oil, many for long periods; others had rested in bed on the various diets and regimes in vogue.

The following is a general outline and not a fixed scheme. In practice it is modified for almost every patient; indeed, if there are diseases for which a diet can be fixed weeks or months ahead peptic ulcer in the early stage is not one of them. The regime cannot be followed safely in detail without medical supervision. Alteration may be needed according to: (1) the symptoms and signs; (2) the tolerance of milk, egg, olive oil, or other foods; (3) the tests for blood in the stools, for acetone, casts, and albumin in the urine, and for the degree of anaemia; and

(4) the general rate of progress. Especially in the early days should the patient be seen often. For these reasons management at home is not as safe and satisfactory as in the clinic, where there is an organization to carry out the regime by those familiar with it, and where tests or examinations can be made or repeated at any time. For many, also, mental relaxation is only possible away from home circumstances.

Rest in Bed

Longer experience has confirmed what was written thirty years ago in this *Journal*—namely, “that the most important point in the treatment of gastric ulcer is to ensure complete and prolonged rest in bed.” . . . “Dietetic and medicinal treatment will relieve” out-patients and others who cannot, or do not, lie up, but will “seldom cure them.” Whereas “cases in bed may be treated in many different ways with good results . . . the conclusion may be drawn that complete rest is a factor without which all other treatment is likely to be disappointing” (Spriggs, 1910; Hawksley, 1940).

The above statement does not disagree with the opinion of a recent writer (Ferriman, 1940), and of many others, that a careful regime of diet and medicine will do good even if the patient is up and about. And we know from scars seen at necropsies, at which a clinical history may be missing, that peptic ulcers have healed in cases in which an ulcer, if not unsuspected, was untreated. It may be assumed that these were of less severity; for the ulcers demonstrated during life heal slowly and imperfectly with inadequate care and treatment, and are apt to become chronic.

Most of our patients, therefore, are washed in bed in the first weeks and use the bed-pan; and when there has been a recent haemorrhage the patient should not move from the supine position for ten days. Milder cases with no occult blood in the stools may get up for bath and toilet; but even then we have the impression that those who are entirely in bed for the first month do better. Restless and nervous patients often learn repose, a lesson of much value for their future health. The suggestion, however, that rest in bed, with a plain diet, is the only treatment needed is contrary to our experience. The muscles of the limbs and back are stimulated during the time in bed by regular massage, the faradic current, and simple limb movements.

Medicines

A neutralizing powder is usually given three times a day after food, with a mechanical sedative such as bismuth, or in some cases before food. We have no doubt that bismuth is helpful, and have mainly used teaspoonful doses in milk or water of a “triplex” powder containing equal parts of oxychloride of bismuth, citrate of soda, and light carbonate of magnesia. If the bowels are loose the magnesia is replaced in part or altogether by precipitated chalk, or increased if there is constipation. A powder of the tribasic phosphates of calcium or magnesium may also be used, varying the proportions as above according to the activity of the bowels; it is more gritty than the triplex powder.

If the patient is watched daily alkalosis is rare. Any suggestion of it, such as a headache, malaise, depression, or drowsiness, especially if confirmed by albumin, blood, or casts in the urine and a rise in the non-protein nitrogen in the blood, is allayed by omitting the powder and giving plenty of fluid. We have not needed to give the rectal injections of 2 to 10 oz. of 2 per cent. ammonium chloride

(Ellis, 1923–4) which have been found effective in severe cases. Indeed, no such condition causing anxiety has so far arisen in the hundreds that we have treated. Even mild tetany, such as is seen in coeliac disease, has not occurred apart from obstructive vomiting, and there has been no case of coma. The patients we see with alkalosis usually arrive in that state as a result of taking alkaline powder at home without medical supervision, and especially after repeated vomiting. They are dehydrated, with an excess of alkali and lowered chloride in the blood (Nicol, 1940). The urine may be acid. Such a recent patient, who needed surgery, still had an N.P.N. index of 70 after several days' treatment. A partial gastrectomy was undertaken with some hesitation, but no untoward symptom developed.

In other cases we use aluminium hydrate, 5 to 10 grains; or aluminium hydrate, 10 grains, magnesium trisilicate 20 grains, kaolin 30 grains—dose half to one teaspoonful; or some proprietary preparation. Aluminium hydrate is not alkaline; indeed, a saturated solution is neutral to litmus. It has, however, a power of counteracting acid which, though less than that of the usual alkaline powders, is still considerable. On occasion, in cases of great superacidity, an aluminium preparation has been given before and an alkaline powder after a meal. Pains are sometimes relieved by atropine 1/200 to 1/150 grain, either under the tongue or dissolved in a teaspoonful of water. This may be given at bedtime.

When there is anaemia iron is prescribed, sometimes at once, at other times about the end of the first week. We use a soft iron pill containing sulphate of iron, 150 grains; calcined magnesia, 20 grains; glycerin, 60 grains. This is made into sixty pills, two or more of which are taken twice a day after food. These pills are almost always well borne.

Sedatives such as bromide or sodium gardenal are useful for restlessness and insomnia, especially in patients with mental worries not yet solved.

Control of Quantity of Food

In Ruthin Castle the food is weighed or measured in order that the amount may be increased by regular steps. Grammes and cubic centimetres are employed, as easier and more accurate in use than ounces. In the following diet tables the ounces are given to the nearest convenient figure.

With a spring balance food can be weighed quickly on a hot or cold plate and a movable dial allows for the weight of the plate. The “dietary scale” made by Messrs. G. Salter and Co., West Bromwich, is satisfactory, and is marked with both grammes and ounces. For fluids, such as milk, there are glass measures marked for ounces or cubic centimetres.

Diet for First Six Days

The first food is an egg-and-milk mixture consisting of one egg stirred up in 3½ oz. or 100 c.cm. of milk, given alternately with olive oil.

In the dietary lists given below the first figure after each food is ounces (1 oz. equals about 30 grammes of solid or two tablespoonfuls of fluid). The second figure (in parentheses) is grammes or, for fluids, cubic centimetres.

1st Day.—Olive oil 1½ oz. (15 c.cm.) at 8, 11, 2, 5, 8, and 10. (770 calories.)

2nd Day.—At 11 and 5 the olive oil is replaced by 1 (30) of the egg-and-milk mixture. (570 calories.)

A little milk or citrated milk is given in the night if patient is awake. A warm milky drink often helps sleep. The patient is encouraged to sip the milky foods slowly, so

as to keep a little in the stomach most of the time. The mouth should be cleansed carefully after each feed.

3rd Day.—8 a.m.: Olive oil 1/2 (15). 9 a.m.: Egg and milk 1½ (50). 11 a.m.: Olive oil 1 (30). 12 noon: Egg and milk 1½ (50). 2 p.m.: Olive oil 1/2 (15). 3 p.m.: Egg and milk 1½ (50). 5 p.m.: Olive oil 1 (30). 6 p.m.: Egg and milk 1½ (50). 8 p.m.: Olive oil 1 (30). 9 p.m.: Egg and milk 1½ (50). 10 p.m.: Olive oil 1/2 (15). (About 1,800 calories.)

4th Day.—The feeds of egg and milk are increased to 2½ (75).

5th Day.—Egg and milk now 3½ (100) at each feed.

6th Day.—Omit olive oil at 8 a.m. Increase egg and milk to 5 (150) at each feed. (1,800 calories.)

The patient often becomes thirsty in the early days. He sips freely of alkaline water containing 30 grains of bicarbonate of soda to a pint, but does not drink more than an ounce or so at a time.

Some patients find olive oil distasteful at first and then take to it with benefit; most feel better at once. In rare cases it cannot be managed at all, and is replaced by a beaten-up egg or occasionally by a small dose of paraffin. Others do not like egg, and that has to be omitted. A few state that in no circumstances can they take milk, but are found to manage well one of the modifications to be mentioned. If, therefore, olive oil, egg, or plain milk, hot or cold, is for physical or psychological reasons not well borne, then one or more of the following milky foods may be given instead in gradually increasing quantities:

A mixture of three parts of milk, one of lime-water, and one of cream. Citrated milk (1 grain of sodium citrate to the ounce, roughly 1/3 teaspoonful to a pint, or a pinch to 100 c.cm.). Milk 3 parts and water 1 part, or more dilute. Milk 4 parts and lime-water 1 part. Powdered whole milk in water. Allenburys, Benger's, or similar milky food.

The times of feeds or medicaments are varied to suit the symptoms. If, for example, the egg-milk mixture, olive oil, or powder is found to relieve an intermittent discomfort, it is given when the discomfort arises. Nausea is not common. Vomiting is rare; should it continue the treatment is modified without delay.

In some *mild cases* in which there is evidence of duodenal irritation but not clear evidence of ulcer, or in which there is clinical and radiological evidence that an ulcer is healing, the diet of about the sixth day is given at once. Treatment in such cases would then be as follows:

Diet for First Six Days in Mild Cases.—Olive oil 1/2 (15) at 8, 11, 2, 5, and 8 and egg-milk mixture 5 (150), to be taken slowly in sips, at 9, 12, 3, 6, and 9.30. (About 1,400 calories.)

Diet from 6th to 11th Day

The diet is now increased a little every day or two. It is not possible to put down each change, but the following is a routine that is often successful. It is not a time-table to be kept to unless progress is continuous and uneventful.

Instead of egg and milk on the *seventh day* add 1 oz. (30 grammes) of well-boiled rice or rice cooked with milk and a teaspoonful of sugar, with 3½ oz. (100 c.cm.) of milk and water, three parts to one. If that is well borne, on the *eighth day* 2 oz. (60 grammes) of minced or pounded underdone chicken is given at noon with milk and water; and the rice (or macaroni or vermicelli) at 6 p.m. with milk and water.

9th Day.—Dry toast 2/3 (20), with butter, is added at noon.

10th Day.—An average diet is here given in full: 9 a.m.: Toast 1 (30); butter; an egg, lightly boiled; milk and water 3 (100). 11 a.m.: Olive oil 1 (30). 12 noon: Chicken, minced or pounded, 2 (60); milk and water 3 (100). 2 p.m.: Olive oil 1/2 (15). 3 p.m.: Egg and

milk 5 (150). 5 p.m.: Olive oil 1 (30). 6 p.m.: Boiled rice 1 (30), sugar a teaspoonful (5); milk and water 3 (100). 8 p.m.: Olive oil 1/2 (15). 9 p.m.: Egg and milk 5 (150). (About 1,630 calories.)

From now on olive oil is given three times a day, an hour before meals, usually a powder afterwards, and frequently soft iron pills.

11th Day.—Noon: Steamed fish 1½ (45), with white sauce 1/2 (15); toast, butter, milk and water.

Extra feeds are continued in the night as before.

Condiments, Vitamins, and General Instructions

No pepper or mustard is used. It is better to do without salt, especially when there is an excess of acid in the stomach, as is common. The normal acid, though derived from the sodium chloride in the blood, persists until a late stage of experimental salt deprivation, and it is unlikely that small variations in the intake affect the degree of gastric acidity; but it is undesirable, as above mentioned, to make the food more tasty than is natural. If the lack of salt is intolerable—for example, with egg—the patient may take the minimum needed to savour it, but never any such quantity as might irritate the raw surface of the ulcer. No salt is used in cooking in the first month; after that a little, if the evidence of healing is satisfactory.

The diet tends to be deficient in vitamin C. There is some in milk, underdone meat, and potato. To many patients we give orange juice twice a day immediately after food. There are, however, cases in which discomfort or pain follows: neither does the more bland "black-currant crush" (1 oz. in water) recently advised suit all patients with ulcer. Ascorbic acid is now available in pleasant tablet form. I have not had enough experience of the clinical signs of its lack among these patients, or of benefit from its use, to write of its value. Vitamin B may also be taken in a tablet.

No *alcohol* is given. *Tobacco* is not advised. Later, when full meals are well borne, one cigarette after a meal is sometimes taken. It is clear from experimental evidence that the effect of moderate smoking on the secretion of hydrochloric acid varies in different people; it is better for most, probably all, to abstain.

The *bowels* may act naturally throughout. In any case they are not disturbed in the first few days. After that, if needed, an enema is given on alternate days or every third day during the time in bed. If motions are hard a teaspoonful or dessertspoonful or more of liquid paraffin is given night and morning. The magnesia in the powder may be increased as mentioned above, or when aluminium hydrate is used one dose daily may be replaced by cream of magnesia or by the *B.P. Codex* mist. magnes. hydrox. et paraff. liq. in doses of about a dessertspoonful.

As soon as solid food is added the patient is instructed to chew slowly and thoroughly. If gums or teeth are diseased they are treated. Deficient teeth are replaced as early as possible.

When the patient is comfortable and begins to feel returning energy it should be remembered that a person who is fairly well, even if in bed all day, may get tired, especially from talking, over-reading, and listening to the wireless. Full rest alone is therefore prescribed from 12 to 1, after lunch for an hour or so, and from 6 to 7 in the evening. Books and wireless are not advised at these times: if the patient becomes restless he may after half an hour take a newspaper or some light reading. Many people doze in the rest hours. Such a nap in the day, at all events before 3 o'clock, does not prevent, indeed often aids, sleep at night.

Diet from 12th to 16th Day

If symptoms have abated additions to the diet may now be made as follows:

12th Day.—7 p.m.: Brains, sweetbread, or tripe 2 (60) and toast 2/3 (20).

13th Day.—Noon: Minced mutton, underdone, 2 (60).

14th Day.—Noon: Milk pudding 1 (30).

15th Day.—Noon: Minced tender beef, underdone, 2 (60). 7 p.m.: Fish, not fried, 1½ (45), and custard 1½ (45).

16th Day.—7 p.m.: Macaroni or vermicelli 1½ (50), with the minced meat.

Example of 16th Day.—8.30 a.m.: Lightly boiled egg; thin toast or bread (not new) 1 (30); butter; milk and water a tumblerful, 6 (170)—that is, milk 4 (110) with water 2 (60)—to be drunk slowly in sips. 11.30 a.m.: Olive oil 1 (30). 12 noon: Chicken 2 (60), roast or boiled; rice pudding 1 (30), with sugar one teaspoonful (5), or arrowroot or cornflour; thin toast or bread 2/3 (20) and butter; milk and water a tumblerful 6 (170). 2 p.m.: Egg and milk 5 (150). 4 p.m.: Thin bread-and-butter, without crusts, 2/3 (20); milk and water a tumblerful 6 (170). 6.30 p.m.: Olive oil 1 (30). 7 p.m.: Steamed fish 1½ (45), with white sauce a tablespoonful (15); macaroni, vermicelli, or spaghetti 1½ (45); custard 2½ (75), scrambled egg 1½ (45), or junket 3½ (100); toast or bread 2/3 (20), butter; milk and water a tumblerful 6 (170). 9 p.m.: Egg and milk 5 (150). (About 2,000 calories.)

Reconsideration if Symptoms Persist

With a short previous history pain usually ceases in four to five days. In more chronic cases it may persist much longer. If in about a fortnight the abdomen is distended and uncomfortable and the appetite flags a return for a day or more to one of the fluid stages is made. An enema may give relief. Should the symptoms not be allayed the diagnosis and treatment are reconsidered. When gastritis and disease of other organs, especially the gall-bladder or appendix, can be excluded, the possibility of a local complication or of neoplasm is always in mind. If there is suspicion of growth the abdomen is explored. Otherwise another x-ray examination is made in four or even three weeks. Nowadays the gastroscope (Schindler, 1940) is invaluable for the diagnosis from other lesions in the stomach and sometimes in the pylorus.

Diet from 17th Day to End of Month

All being well, increases in food may be made as follows:

17th Day.—Noon: A dessertspoonful of plain light mashed potato; mutton or beef 2 (60).

18th Day.—Breakfast: Fish 2½ (75) instead of egg.

19th Day.—Noon: A tablespoonful of mashed potato 1½ (45).

20th Day.—7 p.m.: Macaroni 2½ (75).

21st Day.—8 p.m.: Bread-and-butter, four pieces, or dry toast 2/3 (20).

Example 21st Day.—8.30 a.m.: Steamed or grilled fish 2½ (75) or boiled egg; toast or bread 1 (30), butter; milk and water 6 (170). 11.30 a.m.: Olive oil 1 (30). 12 noon: Minced or tender mutton, boiled or roast, or tender underdone minced beef or chicken 2 (60); mashed potato 1½ (45); rice pudding 1 (30); sugar a teaspoonful (5); toast or bread 2/3 (20), butter; milk and water 6 (170), to be drunk slowly. 2 p.m.: Egg and milk 5 (150). 4 p.m.: Toast or bread 1 (30) with butter, or bread-and-butter 1½ (45), without crusts; milk and water 6 (170). 6.30 p.m.: Olive oil 1 (30). 7 p.m.: Fish cream 2 (60) without seasoning, steamed or grilled fish 1½ (45) with white sauce 1/2 (15); macaroni, spaghetti, or vermicelli 2½ (75); custard 2½

(75) or scrambled egg 1½ (45) or junket 3½ (100); toast or bread 2/3 (20), butter; milk and water 6 (170). 9 p.m.: Egg and milk 6 (170) or fish cooked in batter (leaving the fried batter) 1½ (45). (About 2,300 calories.)

The Following Week.—Whole milk with breakfast and tea. At breakfast: also porridge, from fine oatmeal, 3½ (100) and cream 1½ (45). During morning: egg and milk replaced by milk 6 (170) and a rusk or plain biscuit. At midday meal: sweetbread, calf's head, brains, or tripe are alternatives. At tea: sponge cake 2/3 (20). At 9 p.m.: Benger's food or milk 7 (200).

Diet at End of 4th Week: Full Diet for Healing Ulcer

Breakfast.—Porridge 3½ (100) with cream 1½ (45); fish 2½ (75), fried or grilled, or cold fat bacon or ham 2/3 (20), or egg (poached, boiled, or scrambled); toast or bread 1 (30), butter; milk 6 (170).

10.30 a.m.—Milk a large tumblerful 8 (220), with a rusk or biscuit; the milk to be drunk slowly.

12.30 p.m.—Olive oil 1 (30).

Midday Meal.—Tender mutton (roast or boiled), tripe, sweetbread, calf's head, brains, chicken, or tender cut of beef 2 (60); plain mashed potato 2½ (75); milk pudding 2½ (75), sugar a teaspoonful (5); toast or bread 1 (30), butter; milk 3 (90).

4 p.m.—Toast or bread 1 (30) with butter 1/2 (15), or bread and butter 1½ (45), without crusts; sponge or Madeira cake 2/3 (20); milk 6 (170).

6.30 p.m.—Olive oil 1 (30).

Evening Meal.—Fish 1½ (45), baked, grilled, or fried (leaving any hard outside pieces), with white sauce 1/2 (15); macaroni, spaghetti, or vermicelli 2½ (75), with butter if desired; milk pudding or custard 3 (90) or junket 3½ (100); toast or bread 1 (30), butter; milk 3 (90).

10 p.m.—Milk 8 (220) or Benger's food 7 (200), and a rusk or plain biscuit.

This diet yields about 2,900 calories, and is a full diet for a large person or a young man who is not taking exercise. The average patient will take smaller quantities.

(A bibliography will be given at the end of Part II)

[To be concluded]

Dr. Angus MacNiven in his annual report as physician-superintendent of the Glasgow Royal Mental Hospital states that the conclusions formed by himself and his colleagues from their experience of the use of somnifaine, insulin, and cardiazol therapy are that insulin and cardiazol are safer forms of treatment than somnifaine, which has no therapeutic advantages over insulin or cardiazol. "Cardiazol appears to hasten recovery in the more benign types of mental illness, but it is doubtful whether it produces recovery in cases which, if given time, would not recover spontaneously. It does not produce recovery in the malignant types of dementia praecox, and although it may produce improvement in chronic cases of dementia praecox, in our experience this improvement is almost always transitory. Therapeutic results are always unpredictable, and even in benign types of illness when recovery appears to have taken place a relapse may occur. All these types of treatment have the serious disadvantage that they are unpleasant to the patient, particularly cardiazol, the administration of which causes acute anxiety preceding the convulsion which is sometimes almost intolerable." Dr. MacNiven criticizes these treatments on the grounds that they are not founded on accumulated knowledge of the nature of mental disease and its causation, and he hopes that their use may not lead to a neglect of the study of each case as an individual psycho-biological reaction, which can only be understood and treated in terms of the patient's situation and total personality.