

PAPERS AND ORIGINALS

Treatment of Gross Obesity by Jejunal Bypass

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British Medical Journal, 1974, 4, 311-314**Summary**

Jejunal bypass operations were performed on 47 grossly obese patients. The results were disappointing in three patients who had a standard "14 in/4 in" Payne and DeWind procedure and therefore a more radical operation was performed, joining four inches (10.2 cm) of proximal jejunum to 10 inches (24.4 cm) of terminal ileum. Two years after the modified operation a mean of 44.2 kg had been lost and the weight tended to stabilize. This weight loss was due mainly to inadequate calorie intake. The appetite became more controlled so that if weight was regained this was small in amount. Metabolic sequelae and their symptoms also settled by two years. The physical, psychological, and social outcome was good. The postoperative period was stormy and required close medical and psychiatric supervision. There were two deaths.

Introduction

Gross obesity can rarely be managed successfully by calorie restriction. For this reason jejunal bypass operations have been performed, mainly in the U.S.A. and Canada (Scott and Law, 1969; Payne and DeWind, 1969; Salmon, 1971). In this country only one study has been reported (Baddeley, 1973). These operations result in satisfactory weight loss in most patients. Payne *et al.* (1973) have shown that the lower weight is maintained in the long term and that the side effects disappear in most patients so that restoration is rarely required. Socially and psychologically the outcome has also been good (Solow *et al.*, 1974).

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The operation usually performed is an end-to-side anastomosis of jejunum to terminal ileum, bypassing most of the small bowel. The amount of weight lost may be unsatisfactory, however, and it has been suggested by Scott *et al.* (1971) that regurgitation and absorption from the bypassed ileum is responsible for such failures. They have therefore developed a new procedure in which the bypassed small intestine is drained into the transverse or sigmoid colon, the jejunal segment is joined end-to-end to the distal ileum. Quaade *et al.* (1971), however, have shown that the amount of weight lost is not related to the amount of reflux into the bypassed ileum and have concluded that the modified procedure is unnecessary.

We operated on 47 very obese patients. When the first three after a standard "Payne and DeWind" procedure did not lose sufficient weight we decided to be more drastic. We argued that to bypass even more jejunum but to leave more of the terminal ileum would prolong the period of weight loss without disturbing important ileal transport functions.

We describe here the surgical techniques and short-term course in all patients and the follow up over two to three years of 12 patients who had our modified operation.

Patients

The patients were chosen because they had failed to lose or maintain the loss of significant amounts of fat despite years of dietetic management in and out of hospital. They were all eager to have the operation.

There were 41 women and six men, with a mean age (\pm S.D.) of 40 ± 9 years (range 23-60 years). On average our patients weighed twice (145%-281%) their matched population mean weights (Kemsley, 1951-2). Most patients had at some time been heavier than their operative weight. Some were operated on at a time when their weight was steadily rising after short periods of dieting. One patient's weight had been reduced from 203 kg to 174 kg in preparation for surgery.

Methods

In the first three patients we performed the bypass described by Payne and DeWind (1969). In this operation the jejunum is divided at 14 inches (35.6 cm) from the duodenojejunal ligament and joined to the side of the ileum at four inches (10.2 cm)

from the ileocaecal sphincter. These measurements are taken at the mesenteric border. The proximal end of the bypassed jejunum was closed in two layers and fixed to the mesentery so as to prevent intussusception.

Since this procedure did not produce satisfactory weight loss we chose a more radical bypass for our next 44 patients. In this modified procedure we anastomosed four inches (10.2 cm) of jejunum measured from the duodenojejunal ligament to 10 inches (25.4 cm) of the terminal ileum, the measurements now being taken along the antimesenteric border. In other respects the operation was as described. A midline incision was used and apart from the anastomosis we repaired only umbilical and incisional herniae. In no case did we remove abdominal wall fat (apronectomy), gall bladder, or appendix. We adopted this course in order to minimize postoperative complications. All patients were prepared preoperatively with sulphonamides or neomycin. During the operation and four two hours afterwards rhythmic pressure stimulation was applied to the legs by means of pneumatic cuffs. Postoperatively we used gastric suction and intravenous fluids for a period of up to five days. On discharge all patients were prescribed codeine phosphate 60 mg three times daily or diphenoxylate hydrochloride with atropin sulphate (Lomotil) two tablets three times daily, potassium chloride six tablets three times a day, and ferrous sulphate 200 mg three times a day.

Results

WEIGHT LOSS IN 39 PATIENTS

During the first six months the mean weight loss (\pm S.E.) in 39 patients who underwent the modified "4 in/10 in" procedure was 28.2 ± 4.8 kg (range 10.5-51.9 kg). Six of the patients were men and they lost 34.2 ± 4.6 kg (range 21.2-50.4 kg) and 33 were women who lost 27.3 ± 4.9 kg (range 10.5-51.9 kg). During the second six months 18 patients lost 9.9 ± 1.29 kg (range 0.6-23.2 kg), in the third six months 12 patients lost 3.3 ± 1.05 kg (range -3 to 15 kg), and in the fourth six months these same 12 patients lost 3.3 ± 1.14 kg (range -4.9 to 13.6 kg). These 12 patients had after two years lost 44.2 ± 9.7 kg (range 17.6-83.9 kg). A few patients showed small gains during the second year, but found it easy to avoid excessive weight. The amount lost was not related to the initial weight.

Two patients suffering from diabetes of mature onset achieved better control—one could dispense with tablets and the other required a lower dose.

SURGICAL COMPLICATIONS

Fourteen patients developed wound sepsis, severe enough in five to lead to abscess formation and accounting for four of the six cases of incisional hernia. The fifth of the patients with hernia, who had had a repair of a large ventral hernia at operation, developed a further abscess after two years, but the abdominal wall remained intact. One patient had a complete dehiscence requiring resuturing. Five patients had chest infections, which cleared rapidly with treatment. Two patients showed evidence of deep vein thrombosis leading to pulmonary embolism in one and permanent leg oedema in the other. Piles became very troublesome in four patients. Two patients developed bowel fistulae, one spontaneously and the other after drainage of a wound abscess. Both subsequently had very stormy courses and only slowly recovered. All four patients known to have gall stones at the time of bypass developed a cholecystitis after one, two, four, and 12 months and required surgery.

DEATHS

There were two deaths among the 47 patients. One occurred nine months after the bypass during an influenza-like illness.

The patient had moved from London and refused to attend for regular supervision or to keep close contact with local medical facilities. She had become extremely debilitated from vomiting and diarrhoea. The other death followed cholecystectomy performed four weeks after the bypass. This second operation was complicated by deep vein thrombosis and fatal pulmonary embolism.

LATE COMPLICATIONS

One patient developed a recrudescence of tuberculous meningitis which had been successfully treated in 1959. This occurred four months after the operation when she had lost 25 kg. It responded well to streptomycin, isoniazid, ethambutol, and prothionamide. The treatment was discontinued two years later when her weight was stable at about 60 kg.

In two patients we found contamination of the small bowel. One of these developed a marked malabsorption syndrome with clubbing three years after the bypass, which was easily corrected by a short course of clindamycin. The other patient had several periods of severe diarrhoea leading to marked electrolyte disturbance and weakness during the two years following the bypass. This was controlled by neomycin.

One patient developed gross iron deficiency due to occult blood loss and was eventually discovered elsewhere to have a carcinoma of the caecum. This was removed and the small bowel restored.

CHEMICAL DATA

In 20 patients the magnesium levels fell below 1.5 mg/100 ml. This occurred during the first six months and was easily corrected by oral magnesium chloride. Low potassium levels needing intravenous replacement occurred in a few patients in whom diarrhoea and vomiting were uncontrollable when they were outpatients. The one exception was the patient who resisted readmission and later died. Four patients had low calcium levels with symptoms, but these were corrected with calciferol given for short periods. In one patient this occurred while she was breast-feeding. The serum albumin level fell in 18 patients during the first six months and then rose again. Serum alanine aminotransferase levels rose to about 50 IU/l. during the first three months in 17 patients and then returned to normal. Uric acid levels rose to above 7 mg/100 ml in four patients. Urea levels below 20 mg/100 ml were found in 24 patients. Two patients had low serum iron levels associated with low iron binding capacity and reverted spontaneously. Folate concentrations below 4 ng/ml were found in four patients after six months, but vitamin B₁₂ concentrations remained normal up to three years. Serum cholesterol and triglyceride levels fell by about 50%. Steatorrhoea of 13 g-55 g/day was seen in the eight patients in whom this was measured three months after the operation.

POSTOPERATIVE FEEDING PATTERNS

In the first four to six months after operation there was a reduction in food intake of between 200 and 1,600 kcal/day in all except three patients, who increased their intake postoperatively. These three patients had eaten less than their calorie requirements before operation. The eating patterns were highly variable in the group as a whole and in individuals. Lack of interest in food and loss of appetite were common and often associated with feeling ill, depression, and tiredness. Diarrhoea, abdominal discomfort, and vomiting varied from day to day. In some this was related to the nature and quantity of intake. Most patients resisted the temptation to overeat because they feared the consequences. Many did not eat before leaving home either because the desire to defaecate might occur unexpectedly and

urgently at inconvenient times or because of the embarrassment caused by the explosive nature and foul smell of defaecation.

After six months the patients and their families reported a normal to generous intake overall and a much more normal pattern of eating compared with preoperative habits. Bulimic episodes, nibbling, "night binging," secretive eating, and reactive hyperphagia were very much less in evidence. The patients now felt free to eat with their friends and families, and since most of the patients were married women who prepared the meals there was a considerable reduction of family tension when they could happily prepare the same meal for all and sit down to enjoy it with the rest of the family, which had not often happened in these families for many years. Hyperphagia, which had been a reaction to loneliness, depression, and anxiety, diminished as time went on and disappeared in most as a response to such feelings. In some patients, however, emotional disturbances still caused overeating, which was accompanied by a slowing or stopping of weight loss and in two cases a slight gain. A number felt they had not lost sufficient weight and even sought diets or prescribed them for themselves. Their dietary behaviour postoperatively was no different from that preoperatively—that is, they became irritable and frequently interrupted the diet or gave up completely. There were, however, considerable differences in outcome: moderate diets generally produced a good weight loss and weight lost was difficult to regain. This fact considerably increased the patients' self-confidence and allowed us to prescribe undemanding diets, such as "milk only for two days a week and otherwise eat normally." Appetite suppressants were prescribed occasionally and caused a decreased intake of food, suggesting that the tablets were absorbed. One patient was readmitted for inpatient dieting after losing 38 kg and stabilizing at 102 kg. Unlike previously, she did not regain weight after admission and was 83 kg at the time of writing.

BOWEL HABITS

All patients had bulky, foul-smelling, and fatty diarrhoea, which on occasion was watery. Patients reported that at its worst they had up to 20 motions a day (on average 9-10) and up to 10 at night (on average 3-4). Codeine phosphate 15 mg or 60 mg three times a day effectively controlled this diarrhoea. In those who developed tiredness or lethargy from this drug diphenoxylate hydrochloride with atropine sulphate two tablets up to three times a day was a good alternative. Personal techniques of control included not eating before going out and avoiding excessive fluids and certain foods though there was no particular pattern in the foods avoided.

The 12 patients with a two- to three-year follow-up finally reported between one and five motions a day, and they were rarely woken at night. Control of diarrhoea was an essential for social adjustment. Though incontinence occurred only once in the daytime and twice at night in our series it was a preoccupying fear with many in the early stages and severely limited travelling. Perianal excoriations and minor haemorrhoids were common complications. Borborygmi and the passing of foul-smelling faeces were common problems to many throughout the follow-up period. Most patients learned reasonable control of this problem, but it was an occasional source of serious social embarrassment and often caused considerable personal discomfort.

PSYCHOLOGICAL AND SOCIAL FACTORS

The life of these obese patients was profoundly changed by the operation. Despite having lost much weight they continued to overestimate their body size, but they discarded the self-loathing and self-consciousness so typical of the obese. Overeating

mostly disappeared as a response to unpleasant situations and feelings. In some patients new neurotic symptoms appeared and previous adjustments could be seen to be no longer tenable. One patient, for example, had become obese during a period of promiscuity in adolescence and had married at 120 kg. She had found it easy to remain faithful to her husband. Having lost weight and now finding herself attractive to other men she feared the return of old habits and became frigid. Two patients with longstanding severe phobias still felt lonely and fearful but no longer having any excuse felt disillusioned and more hopeless than ever. Though in most patients there was usually an obvious improvement in social and sexual adjustment and lessening of neurotic symptoms in some relationships became very strained. Some husbands found their newly attractive and active wives not fully to their liking, especially when they were no longer housebound and were planning to take up work and increase their social engagements. Despite this most marriages eventually improved. Five husbands gained considerably in weight while their wives lost. Five families moved house in order to start life afresh unencumbered by the associations with obesity. This usually occurred in those who had had friction with nearby in-laws.

Short-term irritability, depression, tiredness, and anxiety were common, especially during the period of most rapid weight loss. In some the depression was attributable to unreal expectations of the benefits which great and rapid weight loss would bring. Three of the 12 patients who were followed for more than two years were not happy with the outcome. Two were unmarried and considered the loss of 21 kg and 17 kg inadequate, and the third complained of excessive weakness and tiredness and was eventually found to have carcinoma of the caecum.

Discussion

Our findings confirm those of Payne *et al.* (1973), in that we achieved satisfactory weight loss. We agree with them that this operation insures against regaining great amounts of weight. The chemical abnormalities we studied after the operation were either avoided by routine medication or easily corrected when they arose. After weight stabilization they reverted to normal.

A worrying problem requiring further study is the gross fatty infiltration of the liver (Holzbach *et al.*, 1974), but this seems to subside in time (Weismann, 1973).

We agree with Quaade *et al.* (1971) that the end-to-side procedure with the possibility of reflux into the blind loop is not responsible for inadequate weight loss. We found that after bypass men lose more weight than women. It is, therefore, not helpful to compare our results with others who do not take sex difference into account. We have, however, been able to compare the weight loss in our women patients after two years with that in the patients of Quaade *et al.* (1971)—ours lost a mean amount of 44.2 kg and theirs 36.5 kg. Most of our patients were still losing small amounts of weight after two years. Our more radical procedure did not produce greater side effects than the standard Payne and DeWind operation, and unlike Weismann (1973) we did not see B₁₂ deficiency. For these reasons we think our radical modification worthwhile.

We agree with Solow *et al.* (1974) that most patients derive great social and psychological benefit one year after the jejunal bypass. Those living in isolation, as do many unmarried patients, may require a great deal of support, however, if they are to benefit from the freedom which great weight loss brings.

In contrast to obese patients who lose weight with dietary restriction our bypass group showed an almost complete absence of bulimia and nibbling. This change in behaviour may be due to the abdominal discomfort after eating so frequently noted in the first year or to as yet undefined metabolic changes.

The continuing distortion of body image shows that this is either an enduring characteristic of the obese or one that can be discarded only slowly by them. These psychological and

metabolic adjustments are still being studied in 24 of our patients.

Our decision to confine surgery to the bypass procedure and to leave gallstones was wrong: patients soon after bypass are not good operative risks. We also think that subcutaneous heparin might be better in preventing deep vein thrombosis than pneumatic leg stimulation.

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Beneficial Effects of Jejeunoileostomy on Compulsive Eating and Associated Psychiatric Symptoms

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Summary

During a study of 72 patients submitted to jejeunoileostomy for obesity seven were found in whom compulsive, episodic overeating was associated with depressive mood disturbance. When followed up nine to 27 months after operation all seven had lost weight and had also lost the habit of compulsive eating. In all cases psychiatric symptoms improved or disappeared, and symptom substitution was not observed. Obesity rather than psychiatric disorder is usually the main problem in such patients. The implications for psychoanalytic and other concepts of obesity are discussed.

Introduction

The management of obesity is not easy and psychiatrists do not usually succeed when physicians have failed. A modest degree of success is generally accepted for non-medical methods, which rely mainly on group pressures, such as Weight Watchers, and a behavioural approach has shown some promise (Levitz and Stunkard, 1974), but there are still many fat people who fail in their efforts to lose weight or who succeed only transiently.

Surgical methods of weight reduction, notably jejeunoileostomy, are usually successful in achieving and maintaining weight loss (Baddeley, 1973; Payne *et al.*, 1973; *British Medical Journal*, 1974) but are still regarded as a last resort. In our experience they are also widely criticized. Apart from the purely medical objections, which involve balancing the risks of the procedure and its consequences against the not inconsiderable risks of remaining fat, criticism is of two kinds.

The first, which is especially common among physicians and general practitioners, stems from those who seem to feel that such operations are in some way morally wrong since fat people can thus escape what are seen as the natural consequences of their own greed or lack of self-control. "She wants to eat her cake and have it too," is a frequent theme.

The second kind of criticism is voiced by those who see obesity as largely due to an underlying emotional disorder. It is implied that to treat the "symptom" without treating the psyche is to invite disaster. Those of a psychoanalytic persuasion claim that obesity has a "defensive" function against feelings of insignificance or frailty (Wittkower, 1971). According to Glucksman (1972), who has recently reviewed the abundant literature on the psychiatric aspects of obesity, "Weight loss represents a serious psychiatric risk for patients with severe psychopathology. They may benefit more from psychotherapy than from weight reduction." There is a close similarity between such objections and the confident predictions of a few years ago that the treatment of phobias, obsessional states, and other psychiatric disorders with behavioural methods would lead to symptom substitution and failure (Eysenck and Wilson, 1974). The well-documented inaccuracy of these predictions (Rachman, 1971) must cast considerable doubt on the theories which gave rise to them. Nevertheless, we were interested to discover the effect of jejeunoileostomy, performed for weight reduction, on certain kinds of abnormal eating behaviour which are apparently related to emotional disturbance. We were also interested in the effect on the disturbance itself.

In the course of a prospective and retrospective study of 72 grossly obese patients submitted to jejeunoileostomy we found seven who experienced before operation an irresistible desire to eat especially large quantities of food when angry, miserable, or tense. These eating "sprees" varied in duration and frequency, but because they went counter to the patients' professed constant desire to lose weight they were usually followed by guilt and despair, which often led to another spree, and so on—sometimes literally ad nauseam.

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Case Reports

Case 1.—The weight of this 55-year-old woman had dropped from 23 st 7 lb (149.1 kg) to 17 st (107.9 kg) when she was seen 18