ORANGE-PITH ILEUS AFTER PARTIAL GASTRECTOMY

BY

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During the past decade it has become increasingly apparent that after the Polya type of gastric resection there is a very real risk of subsequent intestinal obstruction by the impaction of foodstuffs in the small bowel. The present paper is prompted by the recent occurrence on one surgical unit of three such cases, in all of which orange-pith was the offending substance. This particular complication of gastrectomy should be a preventable cause of morbidity, and it is therefore worthy of wide recognition.

Case 1

The patient, a man aged 63, was admitted to hospital on October 10, 1956. In June, 1955, a retrocolic Polya gastrectomy had been performed for chronic duodenal ulcer, and he had subsequently been perfectly well until one day before the present admission. He then awoke in the morning with severe central abdominal pain, colicky in nature, each spasm lasting about one minute and recurring every few minutes. Twelve hours after the onset vomiting began, and he vomited in all about ten times. He had no bowel action and passed very little flatus after the onset of the pain, which continued intermittently up to the time of his admission.

On examination he looked ill and was slightly dehydrated. His temperature was 97.6° F. (36.4° C.), pulse 90, and B.P. 170/90. The abdomen was moderately distended, but showed no localized tenderness or guarding. Bowel sounds were normal. There was an incisional hernia through part of the gastrectomy incision. Nothing else of significance was found. A straight radiograph of the abdomen showed distended loops of small bowel and fluid levels, thus supporting the clinical diagnosis of acute intestinal obstruction. Laparotomy was advised.

The abdomen was opened through the previous scar, and numerous adhesions required division. The upper part of the small intestine was distended, and on following it down it was found to be obstructed by a mass some 4 by 1½ in. (10 by 3.8 cm.) which was firmly impacted in the lumen at a point about 4 ft. (122 cm.) proximal to the ileo-caecal valve. The "mass" was removed by enterotomy, and found to be composed of four tightly compressed and undigested pieces of orange, inclusive of peel. After closure of the incision in the bowel, the operation was completed by repair of the incisional hernia. His post-operative course was uneventful save for the development of a wound infection.

Case 2

A Hungarian aged 49 was admitted to hospital on June 2, 1958. His history was difficult to obtain, as he spoke little English, but it appeared that he had had intermittent colicky central abdominal pain for about 24 hours. He had vomited four times and there had been no bowel action since the pain began. A gastric operation had been performed in Hungary two years previously.

On examination he was in good general condition, though having fairly severe spasmodic pain. His temperature was 98° F. (36.7° C.), and pulse 70. The abdomen was not distended and was soft on palpation except during the bouts of colic. A straight radiograph of the abdomen showed several distended coils of small bowel with some fluid levels, and there was very little gas in the large bowel. Acute intestinal obstruction was diagnosed. At operation the same day obstruction was found at about the middle of the small bowel, due to a tightly impacted indentable mass. This was removed by enterotomy and found to be composed of

several large pieces of orange-pith firmly compressed together. Exploration of the upper abdomen was difficult on account of adhesions from his previous operation, but it appeared that a Polya-type partial gastrectomy had been performed. His post-operative course was uneventful.

Case 3

A man aged 56 was admitted to hospital on December 3, 1958, with a 12-hour history of intermittent colicky upper abdominal pain. This had begun suddenly, was severe for the first few hours, and then diminished somewhat in intensity. There had been some nausea, but no vomiting. He had passed no flatus since the onset of the pain. In 1947 he had undergone a Polya-type partial gastrectomy for chronic duodenal ulcer and had subsequently remained well until the onset of the present episode.

On examination he looked ill. His temperature was 98° F. (36.7° C.), and pulse 80. The abdomen showed slight distension and was tender in its upper part; there was no guarding or rigidity. Bowel sounds were increased. A straight radiograph of the abdomen showed two distended loops of small bowel with fluid levels.

A diagnosis of subacute intestinal obstruction was made, and as his symptoms appeared to be improving somewhat he was treated in the first instance by gastric aspiration and intravenous fluids. For the first 12 hours on this regime his pain diminished, but bouts of severe intestinal colic then recurred, and laparotomy was advised. On opening the abdomen distended small bowel presented, and on following the distended coils downwards an elongated indentable mass was found, firmly impacted at a point about 2 ft. (60 cm.) proximal to the ileo-caecal valve. The impacted mass was readily removed by enterotomy. It consisted of several large pieces of orange-pith compressed to form a mass 3 by 1½ in. (7.5 by 3.8 cm.). On subsequent questioning, the patient recalled that he had hurriedly eaten an orange about 12 hours before the onset of his symptoms. His post-operative course was uneventful.

Discussion

Intestinal obstruction by foodstuffs was well reviewed by Ward-McQuaid (1950). He traced 178 reported cases, and four of these patients had previously undergone a Polya-type partial gastrectomy, whilst a further case followed gastro-enterostomy. In four out of this group of five cases the obstructing agent was orange-pith. Since 1950 numerous cases of foodstuff ileus following Polya gastrectomy have been reported: Stalker and Gotham (1950), obstruction by orange-pith; Pecora, Pepe, and Cooper (1952), obstruction by macaroni; Rowling (1956), two cases of obstruction by undigested orange; MacPhee (1956), obstruction by orange bolus; Ward-McQuaid (1956), obstruction by orange bolus; Rains, Dawson-Edwards and Brookes (1956), obstruction by coconut; Ryan (1956), obstruction by orange bolus; Norberg (1955), seven cases of foodstuff obstruction, in five of which citrus fruits were involved; Norberg (1956), eight cases of obstruction by orange bolus; Davies (1956), obstruction by orange bolus; MacCarthy (1956), obstruction by orange bolus. The three cases reported above bring the total number of recorded cases of post-gastrectomy obstruction by food to 33, and the obstruction was caused by citrus fruits, particularly oranges, in no fewer than 28 (84%).

There is thus no room for doubt that this complication is a very real hazard to the patient after Polya gastrectomy. So far as I am aware it has been reported only once following the Billroth I operation (Norberg, 1956), probably because it is rarely possible to make a gastro-duodenal anastomosis which is appreciably wider than the lumen of the narrowest part of the small bowel.

Although disimpaction of the obstruction has necessitated enterotomy in the majority of the reported

cases, the mortality has been low, though, as in other forms of intestinal obstruction, delay in treatment may lead to death, as in the case described by Davies (1956).

Intestinal obstruction by foodstuffs would seem to be common enough to warrant the strong recommendation that all patients who have undergone partial gastrectomy or gastro-jejunostomy should subsequently be given careful advice regarding their diet. Oranges constitute the most important hazard, so that only their juice should be taken. All bulky, fibrous, and coarse articles of diet should be thoroughly masticated or chopped up before ingestion. The provision of a small stoma could be used as an additional safeguard in individuals who are considered likely to ignore or forget such advice, but if patients are made aware of the particular danger to which their operation exposes them, most of them should have little difficulty in avoiding this complication.

Summary

Three cases are reported of intestinal obstruction by orange pith after partial gastrectomy. Recent case reports indicate that this complication has become relatively common. The importance of dietary advice to patients after gastrectomy is stressed.

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Medical Memoranda

Thyroid Carcinoma After Irradiation in Adult Life

Considerable interest has been aroused during the past decade regarding the carcinogenic effects of irradiation on the thyroid gland.

Wilson *et al.* (1958) reviewed the literature and reported the development of thyroid neoplasms in nine patients who several years previously had received ionizing irradiation. Seven of the cases were proved carcinomata and two were adenomata with a malignant predilection. In one of the malignant cases the irradiation was given during adult life.

Goolden (1958) related a similar development of thyroid carcinoma in three cases, two having received the x-ray therapy in adult life. He remarked on the paucity of reported cases of thyroid carcinoma after irradiation to the neck region in adult life and stressed the importance of reporting these cases.

Since 1935, 104 cases of carcinoma of the thyroid have been diagnosed in this department by the histological examination of surgical material. Sixty-three of these patients have been interrogated, either personally or indirectly with the co-operation of the

consultants and the general practitioners by questionnaire, for a history of exposure of the thyroid gland to irradiation. Attempts to trace the remaining 41 have so far been unrewarding. In 4 of the 63 cases interrogated an affirmative answer has been received, but in one, that of a woman aged 35, the irradiation was administered to the thyroid only five years before the diagnosis of a malignant adenoma was made. The interval was thought too short for irradiation to have had any significant carcinogenic effect, and the case is not reported.

The other three cases are reported here. Unfortunately there is no record of the dose of irradiation, but it was sufficient to alleviate the condition and was probably greater than 2,000 r, as pointed out by Wilson *et al.* (1958).

CASE REPORTS

Case 1.—A woman aged 79, who had had x-ray therapy in 1940 for thyrotoxicosis at the age of 63, was admitted to hospital in January, 1956, with a fixed, smooth, firm, and greatly enlarged right lobe of the thyroid gland. Partial removal of a tumour involving the whole of the right lobe and infiltrating into the trachea was carried out, followed by radiotherapy. The left lobe was smooth; it was regarded as normal, and was left *in situ*. Histological examination revealed an anaplastic carcinoma. The latent interval between the time of irradiation and diagnosis was 16 years. The patient died six months later.

Case 2.—A woman aged 59, who had had x-ray therapy in 1926 for thyrotoxicosis at the age of 29, was seen in April, 1956, and found to have a very firm and tender right lobe of the thyroid associated with hard palpable glands in the right posterior triangle of the neck and the right axilla. Subsequently, the removal of a malignant mass involving the isthmus and the right lobe of the thyroid, infiltrating along the right jugular vein and upper mediastinum, was carried out, followed by radiotherapy. Histological examination revealed an anaplastic carcinoma. The latent interval was 30 years. The patient died three months later.

Case 3.—A woman aged 46, who had had x-ray therapy in 1937 for thyrotoxicosis at the age of 26, was admitted to hospital in July, 1957, in congestive heart failure complicating thyrotoxicosis, which settled down with carbimazole and digoxin therapy. Partial thyroidectomy was carried out in February, 1958. Examination revealed a papillary adenocarcinoma in a diffusely enlarged thyroid gland. The latent interval was 21 years and at the time of writing the patient was still well with no signs of recurrence.

COMMENT

It is seen that less than 5% of the 63 patients in whom it has been possible to obtain information gave a history of previous irradiation with a latent period of sufficient length for the irradiation to have had any carcinogenic effect on the thyroid gland. They were all female patients, in whom there is a high incidence of spontaneously occurring carcinomata of the thyroid. In this series, 88 were females and 16 males. Again, the histological types were those which occurred most frequently in the age groups to which these patients belong, so that the finding may well be fortuitous. Nevertheless, the cases seem worth reporting.

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