MEDICAL PRACTICE

Hospital Topics

Colonic Retention of Barium in the Elderly after Barium-Meal Examination and its Treatment with Lactulose

B. J. PROUT, S. B. DATTA, T. S. WILSON

British Medical Journal, 1972, 4, 530-533

Summary

Five cases of colonic retention of barium with severe constipation occurring in elderly patients after a barium-meal examination were seen in a two-year period and it is suggested that this complication may be unrecognized. Lactulose 50% (Duphalac) was an effective agent in inducing bowel evacuation in these patients, who were resistant to more generally used methods.

Introduction

Although many thousands of barium-meal examinations are carried out each year, complications of the procedure have been rarely recorded. Killingbeck, (1964) reported two cases of acute large bowel obstruction precipitated by barium-x-ray examination; in both cases carcinoma of the colon was an underlying factor. It is a frequent observation that barium may be retained for an unusually long time in the intestine of elderly people.

This paper reports the cases of five patients who developed severe abdominal symptoms with constipation associated with colonic retention of barium after a barium-meal examination. In four there were no organic obstructing lesions in the bowel.

Case 1

A 71-year-old woman was admitted as an emergency to the psycho-geriatric assessment unit on 24 December 1970 with a history of

vague abdominal pains, depression, and mental confusion of recent onset. Her previous history indicated long-standing abdominal discomfort. In 1966 this had been investigated in the surgical department with negative findings. Her abdominal symptoms had recurred intermittently, and in the autumn of 1970 further investigations had been carried out as a surgical outpatient, including on 25 November a barium-meal examination, which showed no abnormality. The history from the mental welfare officer indicated that since August 1970 she had spent long periods in bed complaining of vague pains in her back, thighs, and abdomen. For a few weeks before admission to hospital she had to be fed by her daughter, who noted that her mother's conversation was irrational and that she had hallucinations.

On admission to the assessment unit she was noted to be depressed, disorientated, and intermittently confused. The positive physical findings were a regular tachycardia, tremor of the fingers, and a mild degree of congestive cardiac failure. The colon was palpable and she was constipated. Routine investigations showed a moderate degree of anaemia (haemoglobin 10.8 g/100 ml) and an E.S.R. (Wintrobe) of 55 mm in one hour. Thyroid function tests showed no abnormality and the blood urea and electrolytes were normal.

Routine measures to clear the bowel were instituted. Senokot tablets two daily proved unsuccessful, and Bisacodyl tablets two nightly together with repeated enemas also had no effect. These measures were continued for two weeks after admission, when physical examination showed a ballooned and empty rectum; the descending colon was no longer palpable but the ascending colon was palpable and thickened.

A barium-enema examination was requested but the preliminary plain x-ray picture of the abdomen on 7 January 1971 showed a bowel filled with what might be described as a barium cast (fig. 1) and no further radiological examination was carried out at that time. After this examination it was decided to try the effect of 50% lactulose (Duphalac) 5 ml administered twice daily. The patient was subsequently noted to excrete chalky stools, and a further x-ray film of the abdomen on 15 February (fig. 2) suggested some dilution of the colonic mass of barium. At that time she had improved physically and was discharged home on 50% lactulose 10 ml twice daily.

At follow-up on 10 May she had remained well, and a plain x-ray film of the abdomen showed that all residual barium had disappeared (fig. 3). Further review in August indicated that her

Royal Cornwall Hospital, Treliske, Truro

B. J. PROUT, M.D., M.R.C.P., Consultant Physician

Barncoose Hospital, Redruth, Cornwall

S. B. DATTA, M.B., M.R.C.P., Senior Registrar in Geriatric Medicine

T. S. WILSON, M.D., Consultant Geriatrician

FIG. 1—Case 1. Plain x-ray film of abdomen, 7 January 1971.

FIG. 2—Case 1. Plain x-ray film of abdomen, 15 February 1971.

progress had been maintained, and subsequent investigation confirmed that there was no evidence of an organic obstruction in the gastrointestinal tract. By that time the haemoglobin had risen to 12.5 g/100 ml and the E.S.R. was 40 mm in one hour.

Case 2

A 70-year-old widow was admitted to the general medical ward on 12 December 1969 with an eight-week history of cramping lower abdominal pains, abdominal distension, and constipation. For about six months she had been experiencing intermittent upper abdominal discomfort, nausea, and slight looseness of the motions since the death of her husband. Her practitioner had arranged for a barium-meal examination, which was carried out six weeks before her admission.

FIG. 3—Case 1. Plain x-ray film of abdomen on 10 May 1971 showing clearance of barium.

On examination the main physical findings were a distended abdomen with slightly increased bowel sounds and occasional visible peristalsis. Electrolytes and results of liver function tests were normal. The blood urea was 75 mg/100 ml, the haemoglobin was 12.5 g/100 ml, with a slight leucocytosis, and the E.S.R. was 49 mm in one hour (Wintrobe). Because of the possibility of an intestinal obstruction plain x-ray examination of the abdomen was carried out. This showed the large bowel filled with barium, but no fluid levels could be seen.

The patient was treated with soap enemas and bisacodyl suppositories with no effect, and later oral Senokot was given in addition. This produced only a minimal effect and she was then treated with 50% lactulose 5 ml twice daily. This induced the passage of chalky stools, and four weeks later the large bowel no longer contained barium on the plain x-ray film. Following this she was given Normacol granules, her bowel function returned, to normal, and she experienced no further abdominal discomfort. The blood urea and E.S.R. returned to normal.

The patient remained well at follow-up three, six, and 12 months later, and no further investigation was carried out.

Case 3

A 76-year-old man had recently been treated for a chest infection and had an episode of diarrhoea presumed to be due to tetracycline therapy. The diarrhoea had cleared. Barium-meal examination showed a possible small gastric ulcer on the lesser curve. As he was reluctant to take any medication because of his previous experience with side effects he was advised to take regular and frequent meals with milk drinks between. The abdominal pain gradually worsened and he became increasingly constipated. He stopped the milk drinks because he believed that the dietary change was associated with the constipation, but this did not alleviate his symptoms.

Five weeks after the barium-meal examination he was admitted to hospital. The only physical signs of note were an empty rectum, a firm enlarged prostate on rectal examination, and a tender palpable transverse and descending colon. The blood count was normal and the E.S.R. was 30 mm in one hour (Wintrobe). The blood urea, electrolytes, liver function, and serum calcium, phosphate, and alkaline and acid phosphatases were all normal. A plain x-ray film of the abdomen showed the colon filled with barium.

Treatment with enemas was instituted but with no effect, and later Senokot and Bisacodyl suppositories were tried with only slight effect. The patient was then treated with 50% lactulose 5 ml

initially twice and then thrice daily. Loose chalky stools were then passed and three weeks later the bowel was seen to be clear of barium on the plain x-ray film. As the upper abdominal pain had disappeared during the stay in hospital a further barium-meal examination was not carried out, but a barium enema examination showed nothing abnormal. The E.S.R. returned to normal and the patient was well four and nine months later.

Case 4

A 70-year-old woman was admitted to hospital on 16 September 1971 with a painful swollen left leg of four days' duration. She was found to have mild maturity onset diabetes of one month's duration and there was a history of anorexia and of weight loss of three st (19 kg) in three months. She had been taking a small dose of prednisolone for three years because of eczema.

On examination she appeared a well-preserved, elderly woman. There were signs of deep-vein thrombosis in the left leg but no appreciable abnormalities were found in the abdomen or other main systems. Rectal examination and sigmoidoscopy to 20 cm showed nothing abnormal. The haemoglobin was 17.2 g/100 ml, the W.B.C. was normal and the E.S.R. was 12 mm in one hour (Wintrobe). The urea, electrolytes, blood sugar, and liver function were all normal. A midstream specimen of urine showed a coliform urinary infection.

She responded slowly to conservative measures. It was thought that an underlying neoplasm was possibly present, and a barium-meal examination was carried out on 20 September. Apart from a calcified aorta no abnormality was noted. On 11 October it was decided to carry out a barium-enema examination. The plain x-ray film showed that the colon was loaded with barium. She was then given Senokot and enemas in an attempt to empty the colon but this resulted in watery diarrhoea. A repeat plain x-ray film on 14 October showed the colon still filled with barium. She was treated with 50% lactulose 5 ml twice daily after which she began to pass chalky stools, and on 21 October the colon was seen to be clear of barium. Six days later barium-enema examination showed the appearances of a carcinoma in the sigmoid colon.

She was considered for resection but developed a chest infection and died on 8 January 1972.

Case 5

An 81-year-old woman was admitted to hospital for investigation of diarrhoea. She had been receiving ampicillin for two weeks because of a chest infection, and the diarrhoea, which started during therapy, had been persistent for four weeks. There had been no response to routine treatment of the diarrhoea, and as she was well preserved and had been previously fit she was referred to the gastroenterology department for further investigation.

On examination she appeared a lean, well-looking woman. There was no appreciable abnormality in the main system, and rectal examination was clear. Sigmoidoscopy showed a non-specific reddening of the mucous membrane. Blood count normal, E.S.R. 38 mm in one hour (Wintrobe), blood urea 65 mg/100 ml, electrolytes normal. Liver function, P.B.I., and T-3 resin uptake were normal. Stool culture grew no pathogens. No definite evidence of malabsorption was found.

A plain x-ray film of the abdomen and a barium-enema examination showed nothing abnormal. A barium meal and follow through examination was carried out and was also clear, but after this the diarrhoea stopped for the first time for seven weeks. An occasional formed motion was passed but lessened in frequency and amount until two weeks after the barium-meal examination the patient was no longer able to open her bowels and complained of generalized abdominal discomfort. A plain x-ray film of the abdomen showed barium filling the entire large bowel.

There was no response to two enemas and treatment with 50% lactulose was instituted simultaneously in a dose of 10 ml twice daily. This cleared the bowel within one week. There was no recurrence of the original diarrhoea and no explanation was found for this symptom. It was presumed that pH changes induced by the barium and lactulose had further altered the bacterial flora of the gut which had initially been disturbed by the antibiotic therapy. Subsequently she remained well.

Discussion

Barium often remains in the intestine of elderly patients for a relatively long period after barium-meal examination. The present cases are reported because of the severity of symptoms resulting from these procedures and also because of the value of lactulose in their management. The five cases were observed between two and six weeks after a barium-meal examination. All the patients presented with a variety of symptoms. Review several months after the episodes showed (in four of the cases) that with appropriate therapy, bowel action had returned to normal and that the patients were remaining in reasonable health. Four of the patients were resistant to enemas administered by experienced nursing staff, and commonly used purgative preparations had no effect in emptying the bowel. The administration of lactulose however, was effective in these cases.

The fourth patient, who was subsequently shown to have a carcinoma in the large bowel, had a watery diarrhoea consisting mainly of returned enema which had not cleared the barium. In view of the experience and successful results obtained from the use of lactulose in the first three patients it was administered to this patient, where the result was similarly efficacious, even though she had a malignant lesion causing partial obstruction to the large bowel.

It was not thought justifiable in the first three patients to proceed to further radiological examinations of the bowel because they had become clinically well, with normal bowel function, and remained well at subsequent follow-up, months after the episode of constipation. The fourth patient was considered on clinical grounds to require further investigation and was subsequently found to be suffering from malignant disease.

The first case shows that chronic constipation and bowel stasis can have a profound effect on the physical and mental efficiency of the elderly, probably due to alteration of vascular reflexes and cerebral blood flow,² and that an examination of the status of the rectum and lower bowel is particularly important in the assessment of geriatric disorders, irrespective of their mode of presentation.

Barium-meal investigation particularly in the elderly may well require specific attention to the subsequent bowel function to ensure that the residual barium is successfully expelled. The fact that five such patients experienced severe constipation and symptoms consequent on a barium-meal examination and came within our experience in less than two years suggests that this may be a much more common occurrence than the recorded cases indicate and that many go unrecognized. Hospital practitioners as well as family doctors should be aware of this complication of barium-meal examination, particularly as many patients undergo these procedures as an outpatient, when delay in the diagnosis of barium retention may result. It may be that "debriefing" after barium-meal examination in such patients is just as important as the preliminary preparation. In this respect it may be that total fasting before the examination and reluctance to drink afterwards initiates the dehydration preceding the retention of barium in the bowel. Moreover, a reluctance to eat after barium-meal examination results in a loss of the "mass movements" of the colon,³ which are dependent on reflexogenic stimuli from the upper bowel.^{4,5} Eating should therefore be encouraged as well as early mobilization, for somatic movement is also an important factor in evoking colonic propulsion in the postprandial period.⁶

The efficacy of lactulose in relieving constipation was reported by Wesselius de Casparis *et al.*⁷ Lactulose is a synthetic disaccharide and has no direct action on bowel muscle or on its innervation. When taken by mouth it reaches the colon substantially unaltered, and acting as a nutrient for the saccharolytic flora it enhances production of lactic and other organic acids. An acid colonic content is said to encourage normal propulsive movements. Despite other measures which had been tried alleviation of symptoms in these patients did not occur until the lactulose regimen was instituted.

In our experience with these and other patients 50% lactulose has been an effective and trouble-free agent in promoting bowel evacuation in elderly as well as younger patients. We suggest that the administration of lactulose after barium-meal examination in the elderly should be a routine in helping to prevent retention of barium and the subsequent morbidity of barium-meal examination.

References

- ¹ Killingbeck, M., *Medical Journal of Australia*, 1964, 2, 503.
- ² Prout, B. J., *Hospital Medicine*, 1969, 2, 1269.
- ³ Holznecht, G., *Münchener medizinische Wochenschrift*, 1909, 56, 2401.
- ⁴ Hertz, A. F., and Newton, A., *Journal of Physiology*, 1913, 47, 57.
- ⁵ Holdstock, D. J., and Misiewicz, J. J., *Gut*, 1970, 11, 100.
- ⁶ Holdstock, D. J., Misiewicz, J. J., Smith, T., and Rowlands, E. N., *Gut*, 1970, 11, 91.
- ⁷ Wesselius de Casparis, A., *et al.*, *Gut*, 1968, 9, 84.

Occasional Review

Sjögren's Syndrome

GRAHAM R. V. HUGHES, KEITH WHALEY

British Medical Journal, 1972, 4, 533-536

Summary

Sjögren's syndrome is a common accompaniment of rheumatoid arthritis and other connective-tissue diseases as well as several diseases thought to have an immunological basis. Despite the wide spectrum of clinical features and serological abnormalities the condition is, if anything, underdiagnosed. A clinical subgroup of patients with Sjögren's syndrome can be distinguished by their pronounced hypergammaglobulinaemia, widespread and prominent immunological abnormalities, severe salivary gland swelling, and mild or absent arthritis. It is in this group that lymphoma development has been a complication.

Introduction

In 1933 Henrick Sjögren, a Swedish ophthalmologist, wrote a monograph on keratoconjunctivitis sicca.¹ Of the 19 females included in the study 13 had arthritis. While arthritis associated with keratitis filamentosa had been described in 1889² it was Sjögren who in this and subsequent studies drew attention to the widespread changes seen in this disorder.

The full triad of Sjögren's syndrome consists of keratoconjunctivitis sicca (dry eyes), xerostomia (dry mouth), and a connective-tissue disorder—usually rheumatoid arthritis.³ The term "sicca syndrome" is reserved for cases in which only the first two features are present. The syndrome with its wide spectrum of clinical features and immunological abnormalities provides a link between the various connective-tissue disorders and in turn between these disorders and malignancy of the lymphoreticular system.

Pathological Features

In the salivary glands the most characteristic change is a diffuse lymphocyte infiltration (Fig. 1). This in turn may lead to

FIG. 1—Labial gland biopsy specimen from a patient with Sjögren's syndrome. (X116.) (Courtesy of Dr. David Evans, department of pathology, Hammersmith Hospital, London.)

destruction and loss of salivary tissue. In the more severe cases lymphoid follicles complete with germinal centres may be seen. Proliferation of the myoepithelial cells lining the ducts may lead to the so-called epimyoeplithelial islands (Morgan-Castleman islands),⁴ though these are by no means confined to this disease.

Lymphoid infiltrates may be seen in the lacrimal glands, the mucus secreting glands of the conjunctivae, the nasal cavity, pharynx, larynx, trachea, and bronchi, leading to atrophy of these glands. The sweat glands and vagina may also show secretory insufficiency and chronic inflammatory infiltrates.

Clinical Features

Keratoconjunctivitis Sicca.—The commonest complaint (see Table) is not of dryness but of grittiness or a burning sensation of the eyes. Other symptoms include tiredness with difficulty in opening the eyes, dryness or occasionally redness, photophobia, and discharge. On examination dilatation of the bulbar conjunctival vessels, pericorneal injection, discharge, and dullness of the conjunctiva and cornea may be seen. Lacrimal gland enlargement is uncommon. The symptoms and signs of keratoconjunctivitis sicca are not specific for the condition and therefore the diagnosis must be made by showing diminished lacrimation, as shown by the Schirmer tear test, and finding filamentary

Department of Medicine, Hammersmith Hospital, London W12 0HS
GRAHAM R. V. HUGHES, M.B., M.R.C.P., Senior Registrar and Clinical Tutor

Department of Pathology, University of Glasgow, Glasgow W.2
KEITH WHALEY, M.D., M.R.C.P., Lecturer