

INTUSSUSCEPTION IN THE ADULT

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Intussusception in the adult is, for several reasons, of considerable interest to the clinician. It is rare compared with the condition in infants, most reports placing the incidence in adults at 5% of intussusceptions at all ages; the aetiological factors are varied; and the clinical presentation varies from chronic abdominal pain to acute intestinal obstruction.

In this article 4 cases are presented from the Coronation Hospital, occurring in the past 2½ years. They illustrate many features of the condition.

CASE HISTORIES

Case 1

A Bantu female aged 33 years, admitted in June 1956 under Mr. B. Lewin. She had had severe attacks of colicky abdominal pain for 1 month. She had vomited after meals for 2 weeks and had frequently passed dark blood in her stools. She had been constipated for 3 months, passing small hard stools, and had lost some weight during 4 months. Two days before admission she experienced another attack of severe colic, associated with absolute constipation.

She was obviously acutely obstructed. She was racked by repeated bouts of colicky abdominal pain, the abdomen was distended, there was visible peristalsis, and loud borborygmi were heard during the bouts of pain. No masses were palpable. The rectum was ballooned but there was no blood on the examining finger. An X-ray showed distended loops of small bowel with fluid levels. There was some free fluid in the peritoneal cavity (Fig. 1).

Naso-gastric suction and intravenous fluids failed to bring about much improvement, and a laparotomy was performed by Mr. Lewin. An ileo-ileal intussusception was found, produced by a circular tumour about 2 inches in diameter and situated about 4 feet from the ileo-caecal junction. The intussusception was easily reduced and the tumour-bearing part of the bowel with 4 inches on either side, was resected. An end-to-end anastomosis was performed. A large lymph gland was dissected off the main mesenteric vessels close to their origin. The patient made an uninterrupted recovery from the operation.

The histological report reads: 'Section of portion of "tumour" from the small bowel shows the presence of slightly oedematous fibrous tissue in which there is a dense focal and diffuse inflammatory-cell infiltration, consisting of plasma cells, lymphocytes and eosinophils. The surface area of the tumour consists of acutely inflamed granulation tissue. Section of the mesenteric gland shows the presence of marked follicular hyperplasia and slight sinus catarrh. Scattered in the medullary area are a moderate number of eosinophils and plasma cells, and scanty lymphocytes. No evidence of malignancy has been observed in the sections examined'. (M. G. Wilcocks.)

Case 2

A Bantu male aged 49 years, admitted under Mr. Lewin in November 1956 with a story of colicky abdominal pain radiating from the right iliac fossa to the right hypochondrium for the

short period of 1 week. He had experienced some vomiting a few minutes after meals, but there had been no interference with his bowel action and he had never passed blood *per rectum*.

A large mass was felt in the epigastrium extending to the right from below the xiphisternum. The mass was smooth and its considerable mobility in the axis of the transverse colon suggested the possibility of an intussusception.

Blood chemistry and blood counts were normal except for an ESR of 25 mm. Wintrobe. X-rays of the abdomen revealed no evidence of intestinal obstruction and no other abnormality. A barium enema (Figs. 2 and 3) showed the typical appearances of an intussusception, with the apex in the transverse colon.

At this stage the patient refused all forms of treatment for religious reasons, and discharged himself from hospital. At the time of writing, he is still alive and reasonably well but refuses any further examination or treatment.

Case 3

A Bantu male aged 40 years, was admitted in December 1955 under Mr. S. Kay, with a short history of colicky abdominal pain and vomiting, and absolute constipation of 4 days' duration. The symptoms started after a night of alcoholic excess. He also complained of anorexia, loss of weight, night sweats and productive cough for 2 months.

He was cold, clammy, and dehydrated. The abdomen was distended and rigid and a mass was palpable in the hypogastrium. The mass was also palpable rectally and there was dark blood on the examining finger.

An X-ray of the abdomen showed evidence of obstruction at the level of the terminal ileum and free fluid in the peritoneal cavity. The radiographic appearances of tuberculosis at the left lung apex were confirmed by the finding of acid-fast bacilli in his sputum.

At laparotomy on the day of admission (Mr. A. E. Wilkinson) a gangrenous irreducible ileo-ileal intussusception was found. The proximal small bowel was much distended. The intussusception, situated about 2 feet from the ileo-caecal valve, was resected and an end-to-end anastomosis performed. No cause for the intussusception was demonstrated. Post-operatively the case ran a stormy course, with a swinging temperature, and the patient died on the 12th post-operative day. Unfortunately no autopsy examination could be obtained.

Case 4

A Bantu male aged 41 years, admitted in January 1957 under Mr. Lewin, with a 4 weeks' story of colicky abdominal pain. Diarrhoea was precipitated at the onset of his symptoms by taking castor oil, and it continued intermittently for 3 weeks. He never passed blood *per rectum*. There was no vomiting but he complained of anorexia and loss of weight. Some burning and frequency of micturition were present.

He was thin and anaemic, but not dehydrated. There was no abdominal distension. A freely mobile mass, rubbery hard and smooth, was felt in the epigastrium, extending into the left hypochondrium. There was no blood on the examining finger rectally.

An X-ray of the abdomen showed some gaseous distension of the small and large bowels, but the appearances did not suggest a complete obstruction. A barium enema demonstrated the

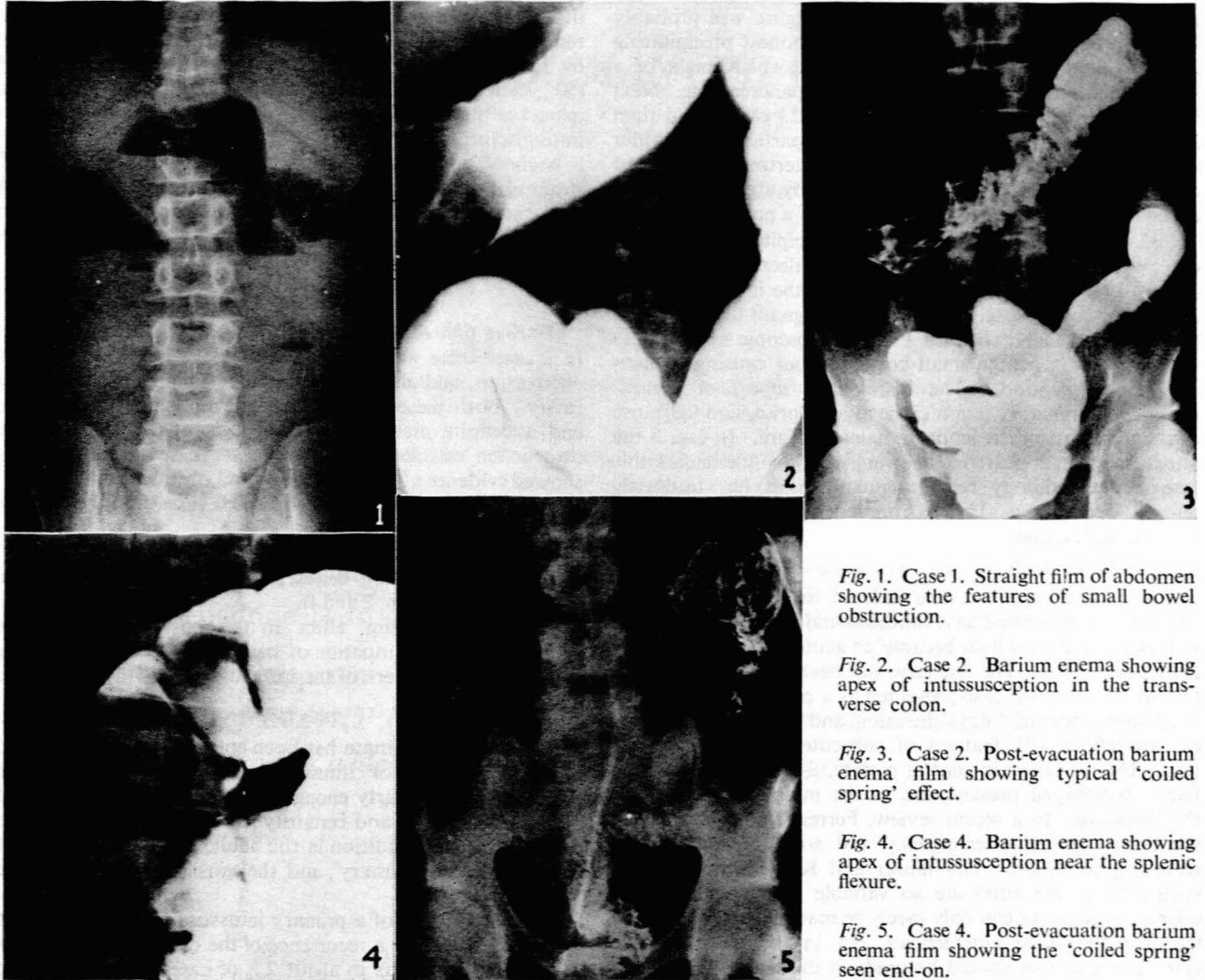


Fig. 1. Case 1. Straight film of abdomen showing the features of small bowel obstruction.

Fig. 2. Case 2. Barium enema showing apex of intussusception in the transverse colon.

Fig. 3. Case 2. Post-evacuation barium enema film showing typical 'coiled spring' effect.

Fig. 4. Case 4. Barium enema showing apex of intussusception near the splenic flexure.

Fig. 5. Case 4. Post-evacuation barium enema film showing the 'coiled spring' seen end-on.

typical appearances of an intussusception with the apex at the splenic flexure (Figs. 4 and 5).

At laparotomy the intussusception was fairly easily reduced, and found to be caeco-colic in type. The apex was formed by an ulcerative lesion with raised edges (palpable through the caecal wall) strongly suggesting a carcinoma. An immediate right hemi-colectomy with end-to-side ileo-colostomy was performed, and the patient made an uneventful recovery.

The histological examination was made by Dr. G. I. Frank: 'Sections from this specimen of caecum and colon show the presence of markedly thickened and very vascular large bowel in which there is much oedema and a diffuse subacute inflammatory reaction. There are areas of acute inflammation, necrosis, and ulceration of both mucosal and serosal surfaces. A few bilharzial ova are present in the submucosa. Sections of lymph glands show the presence of chronic lymphadenitis with reactive hyperplasia and infiltration by plasma cells. There is no evidence of malignancy in the sections examined'.

DISCUSSION

Incidence. Perusal of the literature suggests that intussusception in the adult is rare. Brown and Michels² report only 15 cases out of 430,000 new cases at the Cleveland Clinic. In 1925 Lower⁶ stated that only 52 cases had been reported in the literature. In the period 1913-1940 only

5 cases of intussusception in the adult were seen at the Peter Bent Brigham Hospital.¹ Donhauser and Kelly⁴ reviewed the literature of all cases in the adult reported by American and British writers from 1900 to 1947, and found 665 cases. The appearance of 4 cases in this hospital in the past 2½ years, with at least 1 further case, the records of which could not be traced, suggests that the condition may be commoner than is generally believed.

Age. No age is exempt. In the comprehensive review by Donhauser and Kelly⁴ (665 cases), 426 occurred between 15 and 45 years, but there were 65 cases between 61 and 80 years and 2 cases between 81 and 90 years. The 4 cases reported here were aged 33, 40, 41 and 49 years.

Sex. In this small series there were 3 males and 1 female. Donhauser and Kelly found a ratio of 2 males to 1 female in their review of the literature.

Aetiology

It is well known that, unlike the state of affairs in infancy, 'primary' intussusception, where there is no obvious precipitating lesion, is the exception in the adult. In their review of 665 cases, Donhauser and Kelly stated that 158 were said

to be 'primary', but indicated that the figure was probably far too generous. They found the commonest precipitating lesion to be a benign tumour (213 cases), which might be a lipoma, neurofibroma, adenoma, ectopic pancreas, etc. Next in frequency came malignant tumours (123 cases), and then Meckel's diverticulum. The latter occurs particularly in older children and young adults and is characterized by repeated attacks of partial obstruction, frequently by absence of blood in the stools, and frequently by absence of a palpable mass.

In 2 of the cases presented here, the precipitating lesion was of considerable interest. In case 4 an ulcerating bilharzial lesion of the caecum formed the apex of the intussusception. At laparotomy it closely simulated a malignant ulcer and was treated accordingly. In case 1 the macroscopic appearances were those of a benign small-bowel tumour causing an ileo-ileal intussusception. The histological report of a non-specific inflammatory lesion came as a surprise, and the cause of the inflammatory reaction remains obscure. In case 3 the intussusception appeared to be primary, and in the remarkable case 2 the aetiology remains unknown as he steadfastly refused operation. The barium enema did not indicate any causative lesion.

Clinical Presentation

The 4 cases reported here differed in their presentation. The 1st case presented as a subacute intestinal obstruction of 4 weeks' duration which became an acute obstruction 2 days before admission. The 2nd case was never a clinical obstruction at all. The 3rd case presented as a complete acute intestinal obstruction of 4 days' duration, and the 4th case presented throughout with features of subacute intestinal obstruction. This variation in clinical picture, as compared with the fairly stereotyped presentation in the infant, is reflected in the literature. In a recent review, Ferrer⁵ found that it was sometimes an acute emergency and sometimes a chronic recurring condition. Donhauser and Kelly⁴ state that the symptoms in the adult are so variable that a definite pre-operative diagnosis can only rarely be made. This is probably true for the acute emergencies, but in the more chronic cases the diagnosis should be made in the majority of cases. This is borne out when one considers the cases reported here.

The 4 cardinal signs of intussusception in the infant are intestinal colic, vomiting, the passage of blood *per rectum*, and a mass felt abdominally or rectally, but in the adult it is much less common to find all these features present.

1. *Pain.* All 4 cases in the present series gave a good history of abdominal colic. Donhauser and Kelly⁴ found irregular attacks of abdominal colic to be present with few exceptions. Ferrer⁵ also found this symptom in 22 of his 25 cases. Other authors, however, have not found it so frequently—Brown and Michels² in 9 out of 15 cases, and Deterling *et al.*³ in 30 out of 40 cases.

2. *Vomiting* was present in 3 of the 4 cases. This agrees with the findings of most authors, but Brown and Michels² report it in only 4 of their cases.

3. *Passage of blood per rectum*, as might be expected, was present in the 2 cases presenting acutely, but absent from the 2 more chronic cases. Less than half the cases reported in the literature show this symptom, and Donhauser and Kelly⁴ state that, together with tenderness and rigidity, it is infrequent.

4. *Palpable mass.* A mass was palpable in 3 of the 4 cases reported here. Ferrer⁵ found a mass in the same proportion

of his cases (76%). This is more frequent than the incidence reported by Brown and Michels² (one-third to one-half), by Deterling *et al.*³ (55%), and by Donhauser and Kelly⁴ (50%). It is worth noting that in 2 of the cases in which a mass was palpable, its features suggested the possibility of an intussusception.

Nichols⁶ emphasizes that, in contrast with other forms of strangulation, intussusception in the adult may occur without tenderness and rigidity. Only 1 of the 4 cases reported here was rigid and distended; in this case a gangrenous intussusception was found at laparotomy.

RADIOGRAPHIC FEATURES

A scout film of the abdomen was normal in only 1 case. In 2 cases there were obvious features of lower small-bowel obstruction, and also evidence of free fluid in the peritoneal cavity. Both these cases were clinically acutely obstructed, and a definite pre-operative diagnosis of the cause of the obstruction was not made. In the last case a straight X-ray showed evidence of partial small-bowel obstruction.

Barium enemata were performed in 2 cases, and the features were pathognomonic, viz:

1. An obstruction to the retrograde flow of barium.
2. A rounded filling defect produced by the apex of the intussusception (Figs. 2 and 4).
3. A 'coiled spring' effect in the post-evacuation films produced by the insinuation of barium between the returning and ensheathing layers of the intussusception (Figs. 3 and 5).

TREATMENT

Reduction by enemata has been enthusiastically advocated in some quarters for intussusception in infants, provided the cases are seen early enough. The method has not found general acceptance, and certainly has little or no place in the treatment of the condition in the adult, the reason being that so few cases are 'primary', and the causative lesion has to be dealt with.

Simple reduction of a primary intussusception in the infant is rarely followed by a recurrence of the condition. In Gross's experience this occurs in about 2% of cases. In the adult we usually have to deal with a precipitating lesion. If there is a causative lesion in the infant, it is probably best left for a subsequent operation.⁵ If the condition of the child is very good a large polyp or a Meckel's diverticulum may be excised, but it adds considerably to the risks. In the adult there is more leeway and the cause can usually be dealt with safely. Ferrer,⁵ however, feels that if the causative lesion is questionable, it is better to defer the final operation.

If the intussusception is irreducible or gangrenous, several alternative procedures are available. Incision of the neck of the intussusception may make it possible to complete the reduction. In the Jesset operation the ensheathing layer of the intussusception is incised, and the intussusceptum is amputated as high as possible from within the lumen of the intussusciens. The intussusception may be fixed *in situ* with interrupted sutures at its neck, a lateral anastomosis performed, and the slough of the intussusceptum allowed to pass spontaneously *per rectum*. None of these methods has found much acceptance among surgeons, and resection in one or two stages, according to the conditions present, is preferable.

In mildly obstructed cases, primary resection-anastomosis is usually feasible. With severer degrees of obstruction a

Mickulicz procedure is indicated. An alternative is Muir's method⁷ of decompressing the terminal ileum, after the ileo-transverse anastomosis, by introducing a soft rubber tube or catheter through the closed end of the transverse colon and up the lumen of the terminal ileum for about 6 inches. This tube is brought out through a separate stab incision in the abdominal wall, and is removed in 7-10 days. A further alternative is Woodhall's modification of the Mickulicz procedure: after resection an ileo-transverse anastomosis is performed, but the divided ends of the terminal ileum and the transverse colon are exteriorized. The anastomosis is performed about 2 inches from the divided ends, around which the abdominal wall is closed, leaving 1 inch protruding. These ends are occluded with clamps. If any distension occurs, the clamp on the small bowel is removed. After 7 days an extra-peritoneal closure of the divided ends is performed.

In the ileo-ileal type of intussusception, an enterectomy, including the causative lesion, followed by primary end-to-end anastomosis is indicated if simple excision of the lesion is not feasible. In practice, resection and anastomosis is usually done.

In the 2 ileo-ileal intussusceptions reported here, resection and primary anastomosis was performed, in one because the intussusception was irreducible and gangrenous, and in the other because the causative lesion was thought to be a benign tumour. In the caeco-colic intussusception, the bilharzial lesion of the caecum could not be distinguished from a carcinoma, and a right hemi-colectomy with primary end-to-side ileo-transverse anastomosis was performed.

SUMMARY

1. Four cases of intussusception in the adult are presented. The condition is probably not as rare as is generally believed.

2. The clinical features of the condition are discussed. Presentation differs widely from case to case. There may be merely recurrent attacks of abdominal pain with no clinical intestinal obstruction. There may be recurrent bouts of subacute intestinal obstruction which may terminate in complete obstruction. It may resemble the condition in the infant and present as a sudden acute intestinal obstruction. Vomiting occurs fairly frequently, but passage of blood *per rectum* in less than half of cases. A palpable mass is present in one-half to three-quarters of cases.

3. X-ray of the abdomen will reveal evidence of intestinal obstruction if this is present, while a barium enema shows pathognomonic features if the apex of the intussusception is in the large bowel.

4. In the treatment of the condition, hydrostatic reduction has little or no place in the adult because few cases are primary. At operation the intussusception is reduced if possible, and the causative lesion dealt with according to the conditions present. A simple tumour of the bowel or a Meckel's diverticulum may be excised, but resection and primary anastomosis is usually preferable. In the large bowel, resection in one or two stages, according to the degree of obstruction, is the procedure of choice.

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REFERENCES

1. Botsford, T. W. and Newton, F. C. (1941): *Surgery*, 10, 265.
2. Brown, C. H. and Michels, A. G. (1952): *Ibid.*, 31, 538.
3. Deterling, R. A., O'Malley, R. D. and Knox, W. (1953): *Arch. Surg.*, 67, 854.
4. Donhauser, J. L. and Kelly, E. C. (1950): *Amer. J. Surg.*, 79, 673.
5. Ferrer, J. M. (1950): *Surg. Clin. N. Amer.*, 30, 515.
6. Lower, W. E. (1925): *Ann. Surg.*, 82, 436.
7. Muir, E. G. (1947): *Proc. Roy. Soc. Med.*, 40, 831.
8. Nichols, H. (1941): *Surg. Gynec. Obstet.*, 73, 832.

ADDENDUM

Since submitting this paper for publication, the author has encountered a further case in a young Bantu adult male. This patient was admitted under Mr. B. Lewin with generalized abdominal colic following an attack of diarrhoea the day before admission to hospital. There was a doubtful story of passage of blood *per rectum*. He had no further bowel action after admission but he continued to pass a little flatus. Vomiting and abdominal colic persisted. A significant physical sign was shifting point tenderness in the peri-umbilical area. At laparotomy, an ileo-ileal intussusception was found about 4 feet from the ileo-caecal valve. It reduced easily, and the apex was found to be formed by a smooth round tumour projecting into the lumen from the anti-mesenteric border. A wedge resection of the tumour-bearing segment of ileum (about 5 inches in all) was performed, followed by an end-to-end anastomosis. He made a good recovery after the operation. Histological examination showed that the tumour was a polypoid adenoma with mucoid degeneration.

The explanation of the shifting, but extremely localized, tenderness lies in the much greater mobility of the ileo-ileal as compared with the ileo-caecal intussusceptions. No mass could be palpated in this case.