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RECTAL BLEEDING IN INFANTS AND CHILDREN*

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Bleeding *per rectum* in infants and children may be classified in terms of the quantity of blood passed. Three clinically significant groupings are suggested: (1) slight, less than 1 c.c. in quantity and usually presenting as a drop or so of free blood or as streaking or staining of the stool or of the toilet paper after the stool; (2) moderate, amounting to a dram or so and appearing as free blood mixed or unmixed with the stool; and (3) gross haemorrhage, where the quantity is more than half an ounce at a time and is usually sufficient to give rise to general evidence as loss of blood. Whilst there are likely to be a number of examples in any series of cases where there is no dividing line between these quantitative groupings, yet they serve a useful purpose, and questions on these lines are almost invariably readily appreciated by the parent so that a fairly accurate history can be elicited.

TABLE I. CLASSIFICATION OF RECTAL HAEMORRHAGES: PRE-OPERATIVE DIAGNOSIS AND NUMBER OF CASES

Slight	*Moderate*		*Gross*	
Anal fissure	Polyp	19	Polyp	40
Proctitis:	Multiple polypi	4	Multiple polypi	9
Non-specific	Colitis and proctitis	11	Other tumours	3
Specific	Trauma:		Intussusception	51
Papillitis	Foreign body	2	Colitis and proctitis	4
Cryptitis	Enema nozzle	1	Trauma	3
Prolapse	Cause undiagnosed	18	Peptic ulcer	2
Haemorrhoids			Leukaemia	2
Abscess-in-ano			Thrombocytopenia	2
Fistula-in-ano			Henoch's purpura	1
			Meckel's diverticulum	1
			Cause undiagnosed	26

A review of patients from both hospital and private practice over the 7-year period 1950-56 is analysed in Table I.

SLIGHT HAEMORRHAGE

Most of the cases with slight haemorrhage are of the out-patient class. After attending for one consultation, or occasionally two, they are cured or continue with simple therapy under the care of their family doctors. There are thus no precise comparative figures for this group. However, it is clear that the large majority of slight rectal haemorrhages are due to *anal fissures*. These lesions occur at all ages; they are usually caused by the passage of a hard stool, or sometimes during the course of a bout of diarrhoea, giving rise to the typical, sharp, cutting pain after defaecation, and with a stool commonly described as 'streaked with fresh blood'. Sphincteric spasm is a suggestive sign and frequently prevents throughout examination of the anal verge. In the adult, chronicity of the fissure is common, but in the infant and child it is rare, as the exhibition of mild laxatives or spontaneous softening of the stools for several days together with some lubricant application to the anus, leads to healing.

Proctitis is probably the next commonest cause of slight haemorrhages. It is often found in the course of an attack of diarrhoea or as part of a more general colitis, but many cases occur apart from such conditions. The causes of non-specific proctitis are legion. In children, constipation with faecal impaction is not uncommon, as is also regular purgation administered by over-anxious parents. It is often seasonal and related to new and often not-quite-ripe fruit. On occasion, proctitis has been noted as a complication of acute infections, especially of the oro-pharynx, and it has persisted or even become worse when antibiotics have cleared the original focus. Worm infestation, especially threadworms, commonly causes proctitis. Mucus and pus are often present as well as blood; marked pruritus is a prominent symptom, and tenesmus is common. Sometimes the amount of blood passed is sufficient to put it into the category of 'moderate haemorrhage.'

Under the heading of proctitis, it is convenient to include two localized lesions of the rectum which are occasional causes of slight haemorrhage and produce a clinical picture similar to that of proctitis. The first is *papillitis*, which is being found in increasing numbers in rather older children (10-14 years of age): the second is *cryptitis* which is far less common. Both these conditions with their major distressing symptomatic manifestations, react well to minor operative procedures, and the careful examination required for their diagnosis is invariably well repaid.

Prolapse of the rectum, almost invariably of the partial variety, is an occasional cause of slight or even moderate haemorrhage. It is easily recognized and conservative therapy is usually successful.

Internal haemorrhoids, abscesses, and fistulae-in-ano are all uncommon causes of rectal haemorrhage in children.

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MODERATE AND GROSS HAEMORRHAGE

By contrast with the facility with which a diagnosis of the cause of minor haemorrhage is generally made, the problem in the cases in which bleeding is of more massive character is a major one, because in a remarkably high proportion the cause is not discovered despite the most careful and extensive examination and, sometimes, the cause remains obscure even after exploratory surgery.

It will be noted from Table I that the causes of moderate haemorrhage also operate as causes in the gross haemorrhage category. The essential value of retaining 'moderate' as a distinct class is in relation to the cases itemized as 'Cause undiagnosed'. In general, the quantity of blood passed is the important criterion in assessing the need for laparotomy in the cases in which the cause is not diagnosed, and while this aspect is elaborated below, it is noted here as the justification for classifying 'moderate' haemorrhage as a separate entity.

In our experience, the commonest cause of the more massive forms of haemorrhage is an *adenomatous polyp*. Often palpable on digital examination, usually visible on proctoscopy or sigmoidoscopy and, in a few, revealed by barium enema, the polyp may be extruded during defaecation and its red-ripe raspberry appearance is diagnostic. Its treatment is removal, either *via* the rectum or by laparotomy and colotomy.

The incidence of *multiple polypi*, 13 out of 72 cases of rectal polyp, is a measure of the importance of looking further before accepting the diagnosis of a solitary polyp. The opportunity of a final careful search by sigmoidoscopy during the anaesthesia induced for the removal of the known lesion should not be missed.

Second, and of almost equal frequency as a cause, is *intussusception*. Here, even in the cases where haemorrhage per rectum is the presenting and herald feature, the character of the blood and the clinical picture are usually diagnostic. The occasional atypical, so-called 'chronic,' intussusception may be difficult to recognize, and a barium enema is helpful in settling the matter.

Next in this series come *infections*—enteritis, colitis and proctitis. It is probable that infections are responsible for a much higher proportion of cases or rectal haemorrhage, because many of them do not come to the surgeon but remain with the physician as the haemorrhage is but an incident in the general picture of the enteritis or colitis. Occasionally a *chronic ulcerative dysentery* can only be diagnosed on sigmoidoscopy. There are other cases of haemorrhage *per rectum* which do not present to the surgeon, and the same consideration applies in that their causes should figure more prominently than is reflected in Table I. Such conditions are peptic ulcer, leukaemia, the purpuras, and the haemorrhagic diseases of the newborn.

In peptic ulcer, symptoms referable to the upper abdomen, the occurrence of melaena and an associated haematemesis on occasion, and barium-meal radiography usually lead to, and establish, the diagnosis, However the diagnosis is not invariably simple and straightforward, as is demonstrated by the example of a case in this series where the ulcer was clinically silent, the barium meal was negative, and the sole feature was the melaena stool.

Amongst the cases due to *trauma*, one remarkable case warrants a more detailed note (Fig. 1):

K.V., a boy of 5 years of age, had fallen over veranda pailings on to some recently pruned bushes. A branch of one of these penetrated the skin of his left thigh some 2 or 3 inches above the medial femoral condyle. The boy's father pulled out the broken branch and dressed the small skin laceration. The boy felt bilious soon afterwards and complained of pain; but this did not appear to be severe and medical advice was not sought until some 16 hours after the injury, when an ounce or so of dark blood was passed *per rectum*. This was repeated over the next few hours, the abdominal pain became severe, and vomiting began again. The main features on examination about 30 hours after the accident were the following: Tenderness and rigidity over the hypogastrium; tenderness along the inner side of the left thigh from a small half-inch lacerated wound of the skin at the lower third up to the perineum; marked tenderness and a feeling of bogginess on digital examination of the rectum; and the presence of red blood in the rectum.

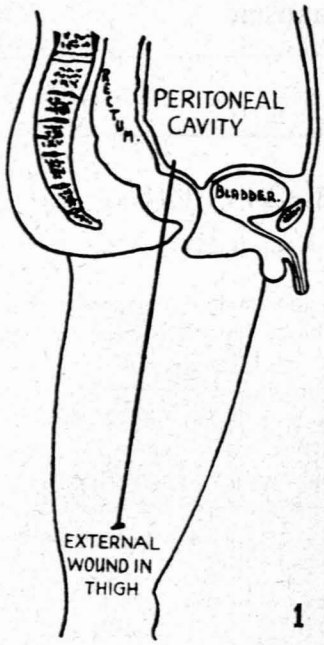

Fig. 1. Case K.V. Diagram of wound track with rectal injury.

Under anaesthesia, proctoscopy showed a laceration of the rectal wall to the left of the mid-line posteriorly, about 2 inches above the anus and, an inch or so higher up, another ragged tear in the anterior rectal wall.

At laparotomy, a pelvic peritonitis with a pool of blood and faecal matter in the recto-vesical pouch was found. The anterior wall of the rectum was perforated just above the peritoneal reflection. This was repaired, the peritoneum was cleaned out and drained, and a colostomy was done. The peri-rectal space, particularly behind the lowest portion of the rectum, was drained by enlarging the track of the penetrating wound and by incising the skin over the track in the perineum.

The subsequent progress was reasonably smooth, and the colostomy was closed after 2 months.

This case was remarkable for the delay in the onset of severe symptoms, and for the rather unusual course of the impaling injury, lending emphasis to the dictum that the diagnosis and treatment of injuries of the rectum are always individual, and usually complex, problems.

The last items in the 2 columns under 'moderate' and 'gross' haemorrhages, labelled 'Cause Undiagnosed' (Table I), represent more than 1/5th of the total number of cases. Investigations including blood counts and blood studies, X-ray screening and proctoscopy and sigmoidoscopy failed to lead to a diagnosis, and a decision had to be made whether it was advisable to seek the cause by exploratory operation.

Apart from the presence of additional features such as an abdominal mass, which may occasionally call for surgical exploration, the outstanding criterion in such a consideration is the severity of the bleeding. On this basis not one of the 18 cases of undiagnosed cause in the 'moderate' group was submitted to operation; in fact during the course of follow-up examinations and repeated laboratory and X-ray investigations, a number of them ceased attending, presumably because the haemorrhage had stopped recurring, and in others such cessation of haemorrhage was confirmed over a lengthy period of regular review.

In the 'gross haemorrhage' group there were 26 cases whose cause was not diagnosed pre-operatively; 4 of them had had a single massive haemorrhage which was not repeated, and the lack of a diagnosis was accepted without the question of laparotomy being raised. These cases illustrate the policy of regarding the primary and real aim of operation as therapeutic in cases not amenable to other forms of treatment and not brought under control by the lapse of time and strictly relegating diagnosis by operation to the position of a means to a therapeutic end. There were 8 instances in this group of unknown cause in which blood transfusion adequately coped with the haemorrhages and their recurrences, and in which, apart from the haemorrhage, there were no other symptoms of the condition; 5 of these cases have stopped bleeding and have been free of it for over 2 years; the other 3 cases are still under observation and the question of surgical intervention is reconsidered from time to time.

Table II presents a summary of the cases exhibiting moderate and gross haemorrhages of unknown cause and their subsequent progress.

TABLE II. PROGRESS OF 44 CASES OF UNKNOWN CAUSE

	Moderate	*Gross*
Solitary haemorrhage	8	4
Spontaneous 'cure' after 1 or more recurrences	10	5
Control by symptomatic treatment (blood transfusion) and still under observation	—	3
Submitted to operation	—	14

The findings in the 14 cases of unknown cause submitted to exploratory surgery are listed in Table III.

TABLE III. FINDINGS AT OPERATION ON 14 UNDIAGNOSED CASES

Polyp of colon	2
Meckel's diverticulum	2
Sarcoma of small bowel	1
Gastric ulcer	1
Contusion injury of sigmoid colon	1
Adenoma and intussusception of jejunum	1
Presence of abnormal vein	1
Cause not established	5

It seems worth remarking on the absence of a case of reduplication of the bowel as a cause of haemorrhage, and this seems to negate the view expressed by Donovan,[1] who places this condition high in importance as a cause of gross intestinal haemorrhage in infants and children.

There are a number of other features of the operative findings that require comment and elaboration.

The 2 cases of Meckel's diverticulum listed in Table III and the 1 case in Table I were heralded by massive haemorrhages associated with the clinical features of sudden and severe anaemia, but they were otherwise symptomless. One case was diagnosed pre-operatively, because the presence of an enterostoma of the umbilicus suggested this diagnosis as the most probable cause of the bleeding. The other 2 cases were discovered at laparotomy; although the presence of a Meckel's diverticulum is strongly suspect as the cause of a symptomless and massive haemorrhage, there is no means of diagnosing it with reasonable certainty except at laparotomy.

The case of haemorrhage due to gastric ulcer is that referred to above as being symptomless and not discovered on X-ray screening.

The contusion injury of the sigmoid colon presented in a child of 2 years of age. No history of the injury was elicited, nor could post-operative enquiries establish the traumatic episode. However, the lesion found at laparotomy seemed to fit this diagnosis better than any other.

No fewer than 5 cases eluded diagnosis despite a careful examination at laparotomy, nor could their causes be found during the subsequent follow-up period: 3 failed to attend for further appointments after a few months; the other 2 reported cessation of the rectal haemorrhage after 4 and 8 months respectively.

The last 2 diagnosed cases listed in Table III, both presented unusual features which, because of their possible bearing on the diagnostic problem as a whole, appear to be worth recording in detail.

B.K., a European girl aged 10 years first presented in June 1951 as a possible acute abdominal condition; and again with a similar clinical picture in January 1952. On both occasions, the symptoms cleared entirely after 48 hours. Investigations afterwards included a barium meal, which was negative. In May 1952 a further bout of abdominal pain, vomiting and, on this occasion, localizing symptoms and signs in the right iliac fossa, led to appendicectomy; however, the appendix is recorded as being of 'doubtful pathology'. Three weeks after this operation she had an attack of severe colic, general in its disposition but most severe in the upper abdomen; and repeated profuse vomiting; she also induced vomiting to relieve the colic. Physical signs were absent.

The symptoms subsided by the 3rd day, and because of the associated constipation, a glycerine and saline enema was given. It produced a stool mixed with dark red blood. This was followed by rapid deterioration of the general condition of the patient, and the signs of peripheral failure became marked, with all the indications of a severe loss of blood. The abdomen became somewhat distended, and tenderness was found in the left hypochondrium. Three further stools consisting of dark red blood, but not black or tarry, were passed in the next hour.

At laparotomy, an extensive irreducible entero-enteric intussusception of the jejunum was found; the whole affected loop of bowel had undergone a volvulus of about three-quarters of a circle, and this loop was non-viable, much of it being frankly gangrenous. The length of affected bowel was resected and an anastamosis was done to re-establish continuity.

The specimen was found to consist of some 7 feet of small bowel; the apex of the intussusceptum was topped by an adenoma (probably benign, but the histological appearances were clouded by the advanced strangulating lesion so that a complete and definite diagnosis remained in doubt).

Her convalescence was surprisingly smooth. Subsequent regular bi-annual examinations, including liver function tests and assessment of protein balance, have been negative.

A feature of considerable interest in relation to the general diagnostic problem, is that relating to the character of the blood passed *per rectum*. Blood originating in appreciable quantity in the small bowel undergoes alteration and can be expected to present as tarry or melaena stools. In this patient this did not occur, and it seems to be important to draw the lesson of such an unusual event: it is essential to include the upper reaches of the small bowel and also the stomach in the examination during laparotomy for the undiagnosed rectal haemorrhage, whatever the character of the blood passed.

The other case, S.M., aged 18 months, recorded in Table III as 'presence of abnormal vein,' is remarkable on account of the considerable rarity of the cause of her rectal haemorrhage (Fig. 2).

Over a period of 6 months, this infant had had 3 massive haemorrhages *per rectum*. On each occasion the blood, bright red in colour, fluid in consistency, and mixed with faecal material, was lost in sufficient quantity to call for urgent hospitalization and the administration of blood transfusions to overcome the obviously

severe exsanguination. On each occasion full investigation, including blood studies, radiological screening, and sigmoidoscopy, failed to produce a diagnosis. Finally, after recovery from the effects of her third haemorrhage, she was submitted to laparotomy.

A large vein (Fig. 2) was found at the base of the mesentery of the sigmoid colon, extending from just above the peritoneal fold at the pelvic floor to near the junction of the left renal vein with the inferior vena cava, both of which latter veins were apparently normal. The abnormal vein, about 2½ inches in length, had a diameter of approximately ½ inch (somewhat more than that of the inferior vena cava) for most of its length. It began by the confluence of two large tributaries in the region of the upper third of the rectum; about ¾ inch proximal to its commencement, there was a communication by a short vertical channel of large

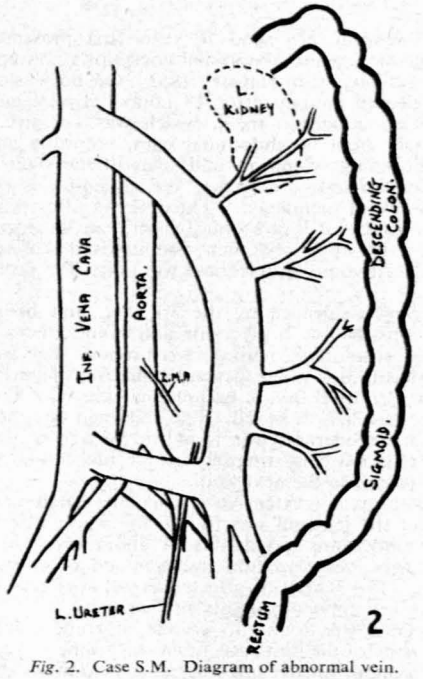

Fig. 2. Case S.M. Diagram of abnormal vein.

diameter to the lateral angle of the junction of the left common iliac and inferior vena caval veins. The main trunk of the abnormal vein continued centrally ultimately to connect with the vena cava just at the site of junction with its left renal tributary. Large radicals from the related portion of the left colon drained into the abnormal vein; a normal inferior mesenteric vein could not be found. The inferior mesenteric artery was of usual anatomical arrangement; it crossed in front of the short communicating venous channel to the commencement of the inferior vena cava. The left ureter was not visualized in the course of dissection and mobilization of the abnormal vein in its upper portion, and it was presumed to be well posterior to this part of the vein; at the lower end, the ureter passed behind the short communicating vein, and then in front of the iliac vessels.

The colon, over a length of approximately 3 inches, from about the apex of the sigmoid loop to the upper portion of the rectum, was congested and bluish in colour and somewhat more thickly walled than the adjacent and paler portions. It was apparent that the portion of the bowel affected by the venous congestion was the site of the haemorrhage which had been passed *per rectum*; and it also seemed highly probable that the abnormal vein was the essential cause of the trouble. Temporary occlusion of the extremities of the abnormal vein demonstrated that the left colon from 2 inches distal to the splenic flexure as far as 1 inch above the pelvic peritoneal reflection was affected. Accordingly this length of bowel was resected (by Paul Mickulicz method) together with the abnormal vein.

A review of the literature, and especially the articles by McClure and Butler,[2] and Huntington and McClure,[3] on the subject of abnormal abdominal veins suggests that the abnormality found in this case is a persistence of the left post-cardinal vein—an abnormality not described in the records available for review.

Apart from the interest in the rarity of this abnormality, the case also points to the necessity for the careful appraisement of the vascular pattern of the bowel in cases of undiagnosed rectal haemorrhage.

SUMMARY

Rectal haemorrhage in infants and children is classified into 3 groups according to the quantity of blood passed. Slight haemorrhage, of up to a few drops at a time, is caused by minor and transient conditions, such as anal fissure, proctitis, anal prolapse, papillitis and cryptitis. Moderate and gross haemorrhages are due to a variety of causes; and the cases over a 7-year period, 1950-56, are tabulated and analysed. A case of trauma to the rectum is presented in detail to give point to the dictum that these injuries are invariably individual problems.

In a remarkably high proportion of cases, despite extensive investigation, including blood studies, sigmoidoscopy and X-ray examination, the cause cannot be diagnosed, and laparotomy must be considered. The decision to operate is based mainly on the quantity of blood lost, whether this is a single episode or whether it is repeated. It is in the light of this criterion for laparotomy that the justification for the classification of the grosser forms of haemorrhage into the 2 categories, 'moderate' and 'gross' is to be found.

The progress of all undiagnosed cases is analysed, and the features of those cases submitted to operation are discussed.

One case of massive haemorrhage due to an adenoma of the jejunum, complicated by intussusception and volvulus, is described in detail, because of the intrinsic interest in the case and also because of the lesson to be drawn from the fact that the haemorrhage *per rectum* presented unchanged, and not as melaena.

Another case, in which the cause of massive haemorrhage in a child of 1½ years of age, was found to be an abnormal vein, probably a persistent post-cardinal vein, is also noted in detail because of the rarity of this abnormality and also because of the possible wider clinical implications of this finding.

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