EMERGENCIES IN GENERAL PRACTICE**THE ACUTE ABDOMEN****II. CAUSES OF ACUTE ABDOMINAL PAIN**

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Last week consideration was given to the examination of the patient with acute abdominal illness; in this article some of the causes of acute abdominal pain are considered.

Inflammatory Conditions

Acute appendicitis accounts in all except very small children for a greater number of abdominal emergencies than any other condition, and should be suspected in anyone who has pain in the right side and who has not had the appendix removed. The typical account of central pain moving later to the right iliac fossa is not always obtained, particularly if the patient has had a number of previous attacks; in quite a proportion of cases the diagnosis is overlooked because the appendix is in the pelvis and a rectal examination is not made, for in such cases abdominal tenderness and rigidity may be absent. Apart from pelvic appendicitis it is rare to find acute obstructive inflammation of that organ without some degree of tenderness of the abdominal wall, even early in the attack, and such tenderness in the right lower quadrant in a patient with a furred tongue and recent pain should always be regarded as evidence of appendicitis unless proved otherwise. The thermometer is not a good guide in the diagnosis of acute appendicitis—there is often a little fever, but a severely gangrenous appendix may cause no rise in temperature. It is safer to make an exploratory incision than to overlook acute appendicitis early in the attack.

There should be no delay in coming to a decision about an operation just because no mass is palpable, but the presence of a swelling during the first few days of an attack is of serious import; the swelling may be the distended inflamed appendix itself, but more often it is an abscess of which the omentum forms part of the wall. Thus it is unusual to feel a mass before perforation has occurred and the best time for operation has passed. Perforation of an appendix rarely occurs on the first day of an attack, but the symptoms may be so mild before perforation occurs that the patient ignores them. Sometimes, by the time the doctor is called in, the patient already has a spreading or generalized peritonitis and it is impossible to say precisely in which organ the inflammation has started; such patients should be explored surgically as soon as possible.

Perhaps the next most common acute inflammatory disease is acute cholecystitis, but this occurs in the middle-aged and much more commonly in women than in men; there may be no previous history of gall-bladder disease and the physical signs are usually confined to the upper abdomen. Where there is a palpable swelling it may be the gall-bladder itself which is distended, or it may be a mass of oedematous tissue, omentum, mesocolon, and adjacent organs with the gall-bladder in the centre, with or without a localized abscess; fortunately acute suppurative cholecystitis rarely causes generalized peritonitis, for there is time for protective localizing adhesions to form. In some cases an x-ray film may show the presence of one or more opaque gall-stones, but a negative radiograph is not helpful; early operation in an attack of acute cholecystitis in an otherwise healthy patient will often cut down the length of illness by many weeks and in good surgical hands carries no more risk than an interval cholecystectomy.

Acute pancreatitis, which accounts for between 1 and 2% of abdominal emergencies, is still a dangerous disease; the rigidity varies in intensity, but is usually confined to the

upper abdomen; the characteristic signs—discoloration in the loin, local swelling, and jaundice—are likely to develop late or not at all; and a confident diagnosis can rarely be made without the help of a raised serum amylase level. The general trend at present is towards conservative treatment, but if any doubt is entertained about the diagnosis laparotomy should be undertaken.

Acute salpingitis of sudden onset is much less common than formerly, but secondary infection of a broad-ligament cyst or hydrosalpinx occurs, and thus the importance of a pelvic examination in patients with acute lower abdominal pain, which may be suprapubic or referred to one or other iliac fossa, is stressed; in many of these patients the inflammation is chronic with acute exacerbations, so that a history of symptoms dating back some months is often obtained and a vaginal discharge is evidence of infection in the genital tract.

Acute diverticulitis of the sigmoid colon may present either with inflammatory or with obstructive symptoms: the tale that it presents as a case of left-sided appendicitis is only partly true, for often perforation and spreading peritonitis may be the first evidence that anything is amiss, while in other cases a localized left iliac or pelvic abscess comes on insidiously and presents as a tender swelling; unfortunately, patients with this disease are often fat and physical examination is difficult. Diverticulitis is rare under the age of 30 and the liability to it increases steadily as age advances; occasionally the acute attacks are accompanied by quite appreciable haemorrhage from the rectum, a point to bear in mind in the differential diagnosis from a growth in the left colon.

Regional ileitis, or Crohn's disease, may similarly present with inflammatory or obstructive symptoms and may be difficult to distinguish from acute appendicitis; a swelling may be present early in the attack, and it is usually more mobile than an appendix abscess and elongated in shape.

In the lower abdomen most of the acute inflammatory lesions require urgent operation in view of the danger of spreading peritonitis; of those that do not require operation, acute enteritis, acute mesenteric adenitis, and tubercular peritonitis should be mentioned. The first two are mainly diseases of children, the third is rarely diagnosed without a laparotomy; the presence of active pulmonary tuberculosis may give a hint to the diagnosis, but it is surprising how this disease in its acute form closely mimics acute appendicitis in both its symptoms and signs.

Acute renal infections may cause some anxiety in diagnosis, for rigidity may make palpation of the kidney difficult, and frequency of micturition may occur in cases of appendicitis or diverticulitis when the inflamed organ is related to the bladder; as a rule, higher temperatures are found in acute pyelonephritis, and examination of the urine for pus cells will probably settle the doubt.

Obstructive Lesions and Colics

The characteristic pain of an obstructive lesion is a colic, and it is usually not difficult to distinguish by their distribution between intestinal, biliary, or renal colic. The main difficulty is in knowing whether intestinal colic is associated with acute organic obstruction or merely with irritation causing excessive peristalsis. Both may be associated with vomiting, but in the absence of organic obstruction diarrhoea rather than constipation is a usual concomitant. The

examination may be most helpful. Palpate the hernial orifices, for strangulated herniae are much the most common cause of acute intestinal obstruction and they are nearly all inguinal or femoral; when a para-umbilical hernia strangulates it is usually because a knuckle of small intestine has slipped into the sac alongside omentum or transverse mesocolon; strangulated obturator hernia is a rarity, and the diagnosis is hardly ever made before operation.

It is important to examine the patient in a good light, as the presence of visible peristalsis is a most valuable physical sign: if scattered peristalsis is present over most of the abdomen there is probably no organic obstruction; if the peristalsis is seen to come and go persistently in the same loop of bowel, then assuredly there is an organic obstruction and operation must not be delayed. Very early and gross distension suggests the occurrence of a volvulus of the sigmoid colon or caecum, but unfortunately many patients with intestinal obstruction are not seen until some distension is present, and this makes the location of any obstruction more difficult; even so, localized distension may be a valuable physical sign, particularly a distended caecum, which in colonic obstruction is usually the first part of the large intestine to become distended even if the site of obstruction is in the left side of the colon. A local mass may also help in the diagnosis; in cases of acute following on subacute obstruction, as, for example, in carcinoma of the colon, the primary tumour is often palpable, but in most cases of acute small intestine obstruction due to intra-abdominal causes, such as bands or internal hernia, no causative swelling can be detected. A vascular lesion of the mesenteric vessels, either thrombosis or embolism, may present as a case of intestinal obstruction; in thrombosis blood is sometimes passed from the rectum, while in cases of embolism the source of the embolus, such as a fibrillating heart, will arouse suspicion.

Of the remaining colics little need be said. Biliary colic does not always show the characteristic distribution and may sometimes be experienced on the left side as much as on the right; in fact, it is rarely confined entirely to the right side; it may be mistaken for the pain of coronary artery disease, but more often the reverse is the case. Urinary colic—renal or ureteric—is much more characteristic and is rarely mistaken for intestinal colic; if suspected, examination of the urine for red cells after centrifugalization may be helpful. These colics do not require urgent operation, and, if confidently diagnosed, antispasmodic and analgesic drugs may be given.

The fact that lead colic still occurs should be borne in mind. It is many years since I have seen a tabetic crisis simulating acute abdominal disease, but a number of patients with acute porphyria have been admitted to hospital as cases of acute intestinal obstruction and the true diagnosis has been suggested only when the dark colour of the urine has been observed.

Perforations

Sudden perforation of a viscus of the alimentary canal into the peritoneal cavity is nearly always due to a peptic ulcer of the stomach or duodenum, but occasionally acute perforation of a carcinoma of the stomach occurs, and mention has already been made of the fact that perforation of the colon may be the first evidence of diverticulitis. The generalized and board-like rigidity of the abdominal muscles, coupled with the dramatic onset, usually leaves little doubt about the diagnosis of a perforated peptic ulcer; occasionally confusion arises with acute pancreatitis, but in this vomiting is likely to be persistent, and when in real doubt a serum amylase estimation will be of value. The other type of perforation which may be overlooked is the leaking duodenal ulcer. A little fluid runs down the right paracolic gutter to the right iliac fossa and then the signs mimic appendicitis; such patients may carry on for a day or two before they call in a doctor, and then at operation the perforation may be found sealed with omentum. It is in just these cases that an x-ray picture of the abdomen will be of great value, for if there has been any appreciable escape

of their contents from the stomach or duodenum free gas in the peritoneal cavity will be evident. Conservative treatment has a place in the management of some cases of perforation of a peptic ulcer, but if there is any doubt about the diagnosis exploration will be the safest course except in an extremely ill patient.

Torsion

There are not many abdominal organs which undergo torsion, as few of them have a sufficiently narrow attachment to provide a suitable axis round which to twist. When a loop of intestine undergoes torsion (volvulus) the symptoms will be those of acute intestinal obstruction; such a volvulus may reduce itself spontaneously, so there may be a history of previous similar attacks. The pain of torsion of an organ is like the pain of an inflammatory lesion; thus torsion of the omentum, particularly if it is adherent in the right iliac fossa, may simulate appendicitis. The omentum rarely undergoes torsion unless it is attached at its apex. Ovarian cysts which twist on their pedicles are usually between 5 and 10 cm. in diameter and can often be felt above the pubes; the smooth rounded nature of the swelling presents early in the attack, and the fact that it is more mobile than an appendix abscess will give away the diagnosis.

Torsion of the gall-bladder or of the spleen is so rare that it is unlikely that the diagnosis would be made before operation.

Haemorrhage

Spontaneous intraperitoneal haemorrhage of sufficient degree to cause severe blood loss is very rare except in cases of ruptured ectopic gestation; the sudden onset, tenderness, and perhaps the presence of a swelling felt on vaginal examination, together with the menstrual history, will usually make the diagnosis clear, often before there is evidence of blood loss. Of greater difficulty in diagnosis is the bleeding into the peritoneum which may be associated with the rupture of a Graafian follicle. The blood loss is not severe, but it is sufficient to irritate the peritoneum and causes low pain, referred to one side or the other; if on the right it is likely to be confused with appendicitis. This condition usually occurs in young women between the ages of 15 and 25 and about the mid-menstrual period; tenderness is most severe immediately above the pubes, and in the pelvic peritoneum when palpated through the rectum. The condition will settle down without operative treatment, but if the diagnosis is in doubt laparotomy should be undertaken.

A dissecting or a leaking aneurysm of the aorta, due to atherosclerosis, may give rise to sudden abdominal pain suggesting an intraperitoneal catastrophe; a difference between the two femoral pulses, or the appearance of bruising, may lead to a correct diagnosis before a laparotomy is performed.

Conclusion

There are many patients who have mild attacks of indigestion, perhaps with intestinal colic and vomiting, for which no cause can be found; these may be due to dietary indiscretions or to the ingestion of some toxic substance. It is most important that such a condition should not be diagnosed in a patient who has an acute abdominal lesion which is likely to lead to peritonitis. In particular, no patient with acute inflammatory disease in the abdomen should be given analgesics or be treated by sulphonamides or the antibiotics until a definite diagnosis has been confidently made and a decision has been reached that the patient does not require an urgent laparotomy. The mortality of acute abdominal emergencies has been greatly reduced in recent years, but the commonest cause of a fatal outcome is still delay in seeking advice or in making a correct diagnosis.

Next article on Emergencies in General Practice.—*"The Acute Abdomen in Children,"* by Mr. Denis Hindmarsh and Professor Donald Court.