EMERGENCIES IN GENERAL PRACTICE**THE ACUTE ABDOMEN****I. EXAMINATION OF THE PATIENT**

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For the purpose of this article the "acute abdomen" is taken as meaning the patient who complains of pain of acute onset in the abdomen, pain being an almost invariable symptom of the conditions which come within this category. As this series is designed primarily for general practitioners this article deals mainly with diagnosis, for it is the diagnosis—and particularly early diagnosis—which is so important in saving lives and in preventing prolonged illness. Treatment is dealt with only in so far as it lies mainly in the hands of the general practitioner, but one of the chief questions in the consideration of these cases is whether the treatment can be carried out in the patient's own home or whether the case is one where the facilities which only a hospital can provide are necessary.

In the diagnosis of acute abdominal conditions the taking of a careful history is most important, for it will often go nearly all the way in establishing the diagnosis and will repay the little extra time occupied in taking it. The age of the patient is the first sign-post, for many acute abdominal conditions are more or less limited to particular age groups. The acute abdomen in children will be dealt with in a later article in the series, because there are a number of acute abdominal emergencies which are almost limited to children; thus, idiopathic intussusception is an illness of infants and acute gastro-enteritis presents particular problems in this age group, while acute non-specific mesenteric adenitis is a disease of older children. Most of the common acute abdominal emergencies may be found at any time during adult life, but in older patients complications of carcinoma or diverticulitis of the colon occur with increasing frequency, while gall-stones and their sequelae are rare in young adults and ruptured ectopic pregnancy is of course confined to the child-bearing age.

History of the Pain

In taking the history pain will usually be the main complaint, and particular attention and inquiry should be paid to this; apart from its duration, information about its onset and character should be sought. There are not many conditions in which the patient is able to state the exact time that the pain began, but in acute perforation of a viscus, in acute pancreatitis, and in the colics—particularly renal or biliary—the patient is often aware of the exact moment of onset. In acute obstruction the onset is not quite so abrupt, while in the inflammations it tends to be much more gradual.

The type of pain is most significant: in the colics the patient will tend to double himself up or roll about during the spasms and lie still in between; often he will press his hands on his abdomen, and the pain waxes and wanes; in the inflammatory lesions and in cases of perforation with peritonitis the patient prefers to lie still, often with his knees drawn up, and dislikes pressure on the skin, though he may blister himself with a hot-water bottle. The distribution or movements of the pain are significant: central pain moving to the right lower quadrant is typical of appendicitis, but may be associated with any inflammatory

lesion in that part of the abdomen or the right side of the pelvis; upper abdominal pain passing through to the back suggests gall-bladder or pancreatic disease, particularly if it also goes to the shoulder-tip—from the gall-bladder to the right shoulder, from the pancreas to the left, but in cases of gastric or duodenal perforation pain may be referred to either shoulder-tip. The distribution of renal pain, with its radiation down to the groin and scrotum or labium is well known, but the pain is not always characteristic, and it is often felt only in the loin and remains strictly unilateral.

Vomiting and Bowel Action

In the majority of acute abdominal conditions, after pain, vomiting is the most common complaint, and inquiry about it must always be made if the patient does not volunteer the information. The type of vomiting is important—it may be reflex, as so often occurs early in the onset of any intra-abdominal inflammatory lesion, in which case it passes off quickly; or it may be associated with the pain of a severe colic, in which case the vomiting or retching spasms coincide with the bouts of pain. In other cases it is due to intestinal obstruction; in high obstruction sickness will occur early and will be persistent, while in low colonic obstructions vomiting may not occur until pain has persisted for many hours or even a few days. Acute pancreatitis is often associated with almost continuous retching, and this helps to distinguish it from a case of gastric or duodenal perforation, in which vomiting is absent or slight. The character of the early vomit is not of great significance, but in cases of prolonged obstruction decomposition in the alimentary canal above the obstruction tends to make the regurgitated contents brown and foul smelling.

The third symptom of importance is any change in bowel action; thus acute gastro-enteritis is apt to be associated with diarrhoea, while constipation is the rule in cases of acute intestinal obstruction, though it may happen that the bowels evacuate their contents from below the obstruction after the onset of the pain. Most inflammatory lesions in the abdomen cause reflex diminution of bowel movements, and are thus associated with constipation, but inflammation in the pelvis, particularly in pelvic appendicitis, may cause irritation of the rectum and some tenesmus, which the patient interprets as diarrhoea.

Other Necessary Questions

Disturbances of micturition should also be inquired into. I am not dealing with the subjects of acute retention of urine or anuria as emergencies, but only with the reflex disturbances which occur; thus in renal colic there is often, but by no means always, frequency of micturition and dysuria during the attack of pain, and inflammation in an organ related to the bladder—for example, a pelvic appendix or the Fallopian tubes—may cause frequency.

In women, inquiry concerning the menstrual cycle is pertinent. When was the last period? Is there a possibility of pregnancy? and, Is there any vaginal discharge; if so, of what duration?

Finally, in taking the history, note should be made of the previous history of the patient. Have there been similar attacks before? Have there been any symptoms to suggest a peptic ulcer or gall-bladder disease, renal stone, or intestinal colic, alimentary bleeding, or loss in weight? Has there been any previous abdominal operation, and is there

any condition outside the abdomen which might give rise to pain referred to the abdomen? The answers to any of these questions may have an important bearing on the diagnosis and correct treatment of the patient.

The Physical Examination

The examination of the patient will start with taking the temperature and noting the pulse and respiration rates. It is unusual for the temperature to be really high, and when it is above 102° F. (38.9° C.) the cause should be sought elsewhere. It may be due to influenza with abdominal symptoms, or to causes outside the peritoneal cavity, such as respiratory or urinary tract infections. In most cases of intraperitoneal infection there is a low fever, though in the early stages the temperature may be normal; in the obstructions or perforations it is either normal or sub-normal.

The pulse rate initially is not of great diagnostic value, but it is essential to record it, for if there is doubt about the diagnosis a rising pulse rate is of serious import and probably indicates extension of an inflammatory process or continuing haemorrhage. Coronary infarction may cause pain referred to the abdomen, and in this condition the quality of the pulse is important.

In pneumonia, particularly in children, pain from the chest may be felt in the abdomen, but some upper abdominal conditions, especially perforation of an ulcer or pancreatitis, may also cause an increase in the respiratory rate.

Inspection of the tongue is a valuable aid in acute abdominal diagnosis; thus it is very rare to find a clean tongue in a case of acute obstructive appendicitis. Patients with uraemia may present with vomiting and constipation, and so simulate acute intestinal obstruction, but in the uraemic patient the tongue will probably be more dry and furred and the breath may have the characteristic smell.

Inspection and Palpation of the Abdomen

Abdominal examination will begin with inspection in a good light, attention being directed to the respiratory movements, any local swellings, or visible peristalsis. The site of most pain may be indicated by erythema where a hot-water bottle has been applied, but in all cases the patient should be asked to point where the pain started and where it is now felt most severely. In all cases, but particularly those in which there is a possibility of acute intestinal obstruction, the inguinal and femoral canals should be palpated, for, if this is not made a routine, a strangulated hernia may be overlooked. At the same time the scrotum should be palpated to make sure that both testicles are present in the right place and that they are normal, for in acute epididymo-orchitis or torsion of the testicle the pain may be referred to the corresponding iliac fossa.

The presence of the scar of a previous operation may raise the suspicion that obstruction is due to an adhesion which may have caused a local obstruction or strangulation of a whole loop of intestine. Most of these cases are caused by talc granulomata, and the use of this substance as a glove lubricant should by now have been abandoned in favour of an absorbable glove powder.

Palpation of the abdomen will start well away from the suspected site of the lesion and should be very gentle at first, for anything but very light pressure may cause spasm of the abdominal muscles and thus mask an underlying swelling. The board-like rigidity in the case of a perforated peptic ulcer is well known and gives away this diagnosis, but if there has been only a little leakage into the peritoneum the physical signs are less definite and the diagnosis is much more difficult; acute pancreatitis may cause an almost equal amount of rigidity, but usually it is not quite so extensive. In the colics severe spasm of the parietal muscles will be present during the attacks, but in between, when the muscles are relaxed, deep palpation will be possible; thus the rigidity of these cases can be distinguished from that associated with the perforations and the inflammatory lesions. Occasionally in acute obstruction of the

small intestine the loop above may be felt to harden up during the spasms, but this rarely happens in obstruction of the large intestine.

The presence of a local swelling may give a very strong lead to the diagnosis: if such a swelling is found during the first few hours of an attack it was probably present before the attack started, and if the other investigations point to the case being one of an inflammatory lesion the inflammation is probably arising in an already diseased organ; if the case is one of acute intestinal obstruction the mass is probably a tumour which is obstructing the bowel. If such a local mass is felt its mobility should be tested: inflammatory swellings tend to be fixed early, but occasionally an appendix abscess, in which the wall is formed entirely by omentum, may be movable; inflammatory gall-bladder swellings tend to lose their normal up-and-down movement with respiration as they become fixed to surrounding structures.

Conclusion of the Examination

If there is any possibility that the pain is referred from the chest careful examination of the heart and lungs is necessary; mention has already been made of the fact that pain of coronary thrombosis or a basal pleurisy may be referred to the abdomen. Palpation of the neck and axillae for enlarged lymph nodes is necessary, either because the patient may have an acute inflammation of lymph nodes generally—including those in the abdomen, as, for example, in glandular fever—or there may be metastatic malignant nodes in either of these sites from a primary growth in the abdomen.

Finally, but by no means the least important, digital examination of the rectum, and perhaps the vagina, must be made. Some pelvic swellings may be palpable only by this route. In acute intestinal obstruction the rectum will be empty unless the case is one of faecal impaction, but a rectal tumour may be felt or the characteristic ballooning, which is present below an obstruction a little higher up, may be noted. Inflammatory swellings in the pelvis will be felt and will be tender—a pelvic appendix, Fallopian tube, or an ovarian cyst; a malignant tumour elsewhere in the abdomen may have given rise to pelvic metastases, and their presence will be an indication both of the diagnosis and of the prognosis. In cases where salpingitis is suspected, inspection of the vulva will show whether the hymen is ruptured and whether there is any vaginal discharge.

If there is any question of a renal lesion the urine may be examined. In renal colic it may contain blood, and in the urinary infections there may be sufficient pus to cause a turbidity which does not disappear on warming or adding acid; it may be necessary to examine a centrifuged specimen for pus cells and to have a mid-stream or catheter specimen taken and cultured for organisms. A trace of albumin is found in the urine of many patients with extra-renal inflammatory lesions and does not necessarily indicate an organic lesion in the urinary tract.

Ancillary Investigations

Apart from the pathological examination of the urine to which I have just referred, all the examinations already discussed are entirely clinical and can be carried out by any doctor in the patient's own home or the surgery, and should lead to a correct diagnosis in the great majority of cases. The main thing for the general practitioner to decide is whether he can safely treat the patient at home or whether further investigations or treatment which cannot be carried out in the home are necessary. Of course, if the diagnosis is such that urgent operation is indicated the patient must be transferred to a suitable place, and there will always be a number of patients in whom the diagnosis is in doubt who are better in hospital, where operation can be undertaken quickly if any change takes place in the patient's condition to make this necessary. There are very few special investigations which are likely to be called for in this group of cases, but such as there are are most

important. Of these I would place first a plain radiograph of the abdomen; it may reveal free gas in the peritoneum in cases of perforation, a loop of distended intestine or more generalized distension with fluid levels in acute intestinal obstruction, or the presence of a stone in the urinary tract. Even when the diagnosis of acute intestinal obstruction is clear and a decision in favour of early operation has been made, a radiograph will often help the surgeon in planning his incision and in dealing with the cause (see illustration).

Plain x-ray film of a patient with intestinal obstruction, showing a distended loop of jejunum and a gall-stone in the left side of the abdomen.

Examination of the blood may also be called for; a leucocytosis will be found in most inflammatory conditions, and such a finding is occasionally helpful. In cases in which acute pancreatitis is suspected estimation of the serum amylase is most important, though it is occasionally elevated in a few other abdominal emergencies; a very high figure is almost diagnostic of acute pancreatitis, but is only likely to persist for a few days early in the attack.

In this article the examination of the patient with acute abdominal symptoms has been briefly described; next week some of the specific diseases which cause such symptoms will be considered.

Part II will appear in the next issue.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners are still available at 25s. (postage 1s.) each. The first volume is now sold out.

Clinical Pathology Book.—"Clinical Pathology in General Practice," a collection of 39 articles on clinical pathology that appeared in the *Journal* as part of the Refresher Course for General Practitioners, is now available, price 21s. (postage 9d.).

Both these volumes are obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

The Parliamentary Secretary to the Minister of Labour and National Service, Mr. HAROLD WATKINSON, announced recently that there would be a continuing "competition" for posts of H.M. Inspectors of Factories instead of the former two a year. This is to ensure that 10-15 new members are recruited each year, so that the Inspectorate remains at a total of 380. The service began with four men appointed to enforce the 1833 Factory Act. The "certifying surgeons" who helped them had to guess the children's ages from their appearance; since registration of births became general only after 1837. Alexander Redgrave, Chief Inspector when the inspectorate was centralized in 1878, explained its aim in words still applicable when he said that the inspector must be an adviser rather than a prosecutor.

SECOND INTERNATIONAL CONGRESS OF NEUROPATHOLOGY

SOME SCIENTIFIC CONTRIBUTIONS

[FROM A SPECIAL CORRESPONDENT]

Many of the 180 papers* presented at the Second International Congress of Neuropathology, which as reported last week (p. 734) was held in London, September 12-17, were grouped into special sessions under headings such as "the blood-brain barrier," "intoxications," "trauma," "pathology of involuntary movement," "granulomas and reticulososes," "gliomas," without necessarily being very closely related.

Tentorial Herniation and Temporal Lobe Epilepsy

However, a joint session with the 4th Symposium Neuro-radiologicum, also meeting in London on the Wednesday afternoon, took the form of a discussion on "Tentorial Herniation," which has recently come to be regarded as an important cause of temporal lobe epilepsy, and various brain lesions. The tentorium, it will be recalled, is a membrane which divides the skull cavity, separating the cerebral hemispheres above from the cerebellum and medulla below, and possessing one free border, sharp and crescentic, curving anteriorly round the brain stem. Under certain conditions parts of the temporal lobes, particularly the uncus, may be pushed down against or beyond the free crescentic edge into the lower compartment. This leads to ischaemia of the compressed herniated parts and sclerosis, and the scar may become an epileptic focus. The ischaemia may be a direct effect of the compression, but various vessels, including branches of the anterior choroidal artery, which supplies the hippocampus, may also be caught and squeezed in the hernia. The hernia is a result of increased cerebral pressure, for instance from cerebral infarction, as described by J. M. FOLEY (Boston). H. W. PIA (Giessen) explained vascular lesions of the occipital lobes not, as previously thought, on the basis of compression of the posterior cerebral arteries caught in a hippocampal herniation, but of compression of the internal occipital vein against the tentorial border, leading to venous congestion and infarction. J. L. POOL (New York) discussed the neurosurgical relief of uncus herniation where raised cerebral pressure is the result of cyst, tumour, or haematoma. Decompression and a gentle lift were usually enough, and splitting of the tentorium was rarely necessary or advisable. L. WOLMAN (Sheffield) analysed the findings in 270 patients dying with a tentorial pressure cone; 12% showed haemorrhagic infarction of the occipital lobes, and infarction of the pituitary gland was found in nearly 5%.

Late Effects of Brain Injury

Other post-mortem brain studies were discussed in the section on trauma, where C. E. BENDA (Waverley, Mass.) made the point that the effect of a single head injury is not restricted to that event, but progressive, leading to interference with the circulation and nutrition of the brain, with further pathological repercussions. This is particularly so in infancy and childhood, where trauma may distort the whole of subsequent brain development. Several papers tried to correlate the antemortem clinical signs with the results, both macroscopic and microscopic, at necropsy, including one by A. C. LØKEN (Oslo) on a boy nearly 18 years old who survived four and a half years in a state of decerebration, following a ten-minute arrest of heart and respiration. During this time he mostly lay with open eyes, though blind, and responded to strong auditory and painful stimuli with slow complex movements of his arms, trunk, and face; his secondary sexual characteristics developed normally.

*The majority of the papers read at the Congress have been abstracted in *Excerpta Medica* (Section VIII, Neurology and Psychiatry), 8, No. 9, September, 1955.