Current Practice

DISEASE OF THE DIGESTIVE SYSTEM

Diagnosis of the Acute Abdomen

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Brit. med. J., 1968, 1, 491-493

The patient with acute abdominal pain remains today as the principal purely *clinical* problem which confronts the medical practitioner. In no other common situation is reliance on clinical features, immediate decision, and accurate diagnosis of such paramount importance. In most other fields an initially tentative, or even incorrect, clinical diagnosis is not necessarily harmful; we can wait until it is confirmed or refuted by laboratory and radiological investigations. But in acute abdominal conditions delays of even a few hours in initiating the correct line of treatment may make the difference between a smooth or stormy course—or indeed even place the patient in lethal danger. To leave, for example, an early case of perforated peptic ulcer overnight undiagnosed and well sedated with morphine means missing the opportunity of achieving almost certain recovery for this patient; next morning one will be faced with a desperately ill patient with advanced peritonitis whose chances of survival have been seriously jeopardized. Sir Heneage Olgilvie summed this up perfectly when he wrote that “in the acute abdominal emergencies the difference between the best and the worst surgery is infinitely less than that between early and late surgery, and the greatest sacrifice of all is the sacrifice of time.”

Acute abdominal pain is not only an important diagnostic problem but it is also often a difficult one. It is vital to remember that the pain may result from disease of almost any organ in the body. Apart from the abdominal and retro-peritoneal viscera themselves, including of course the pelvic organs, one must also consider the chest, the central nervous system, and even the ears and throat. Basal pneumonia, acute cardiac ischaemia, and spinal root irritation can all mimic the acute abdomen. Children with otitis media are notorious for complaining of belly-ache. Metabolic disorders, particularly diabetes, but also acute porphyria, may give acute abdominal symptoms. Finally the psychological disturbance of the Munchausen syndrome provides us with a teasing diagnostic difficulty.

History Taking

The essence of diagnosis is, of course, a careful history and full examination; neither is easy when the patient has acute abdominal pain.

A fine economy must be employed in history taking; there is nothing to gain by exhausting and exasperating an ill patient with irrelevant questions. Yet such valuable gems of information as the shoulder-tip pain of diaphragmatic irritation in the perforation of a peptic ulcer or in haemoperitoneum following abdominal trauma, a missed menstrual period which suggests ectopic pregnancy, or blood-stained urine which has accompanied the violent colic of a ureteric stone must not be left uncovered.

Inquire about the severity, the speed of onset, the exact duration, and the accompaniments of the pain. Most serious intra-abdominal conditions stop the patient from sleeping and make it impossible for him to go to, or to continue at, his work. Of course there are always the exceptions; I have woken an obese lady from a deep sleep and have found her to have a gangrenous and perforated appendix. Perforation, torsion, and stone impaction have an acute onset and the patient can describe the exact moment at which his torture commenced. Inflammation and obstruction, in contrast, tend to come on insidiously.

Sometimes it is rather difficult to be sure whether the symptoms represent some minor abdominal upset or warrant more serious consideration. Here I have always found Sir Zachary Cope's aphorism useful; that a previously healthy patient who complains of severe abdominal pain for more than about six hours' duration is usually suffering from an acute surgical condition.

The accompaniments of the pain are far more valuable than any description by the patient of the pain itself. The man with peritonitis rarely wants to move, whereas the patient with renal or biliary colic, or with an intestinal obstruction, can usually hardly hold still with the pain. Jaundice or haematuria during the present or a previous attack are important pointers to gall-stones or renal calculi.

While on this topic it is worth remembering the important clinical observation by French and Robb¹; unlike the usual textbook description they found that biliary and renal colics are only very rarely intermittent in nature. Usually the pain is constant and continuous or else continuous with exacerbations. Intestinal colic, however, does indeed come on with waves of intermittent pain.

One last point in the history; although the patient is more than anxious to tell the doctor about his bowel actions, he will only discuss passage of flatus on direct questioning. A few days of constipation are of no great relevance, but 24 hours without the passage of wind denotes a complete intestinal obstruction, or paralytic ileus.

Examination

The clinical examination, too, requires its own particular skill. The common mistake in an emergency situation is to rush ahead and palpate the abdomen at once. Time spent in careful observations of the patient as a whole and of the abdomen in particular is time well spent indeed. It is important to search for small clues. Start by taking the temperature and pulse rate. One should be suspicious of the diagnosis of acute appendicitis without pyrexia; it does occur, but it is unusual. Auricular fibrillation associated with the features of paralytic ileus will suggest a mesenteric embolism. The coated tongue is certainly common in peritonitis and acute appendicitis, but, again, it is not an invariable finding. The

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patient's posture is helpful. The restlessness of colic is in sharp contrast to the stillness of peritoneal irritation. The girl sent in with acute appendicitis who is pale and fainting is more likely to have a ruptured ectopic pregnancy.

Turning now to the abdomen itself, it should be scrutinized for distension, either local or general, for visible peristalsis, or for the presence of a previous laparotomy scar. Even if this is 20 years old and almost forgotten about it may indicate the presence of underlying adhesions or an obstructing band. Although the anatomist delimits the boundaries of the abdomen as being from the xiphoid to the pubis, the wise clinician will take these borders to be the nipples above and the knees below, and he will have all the territory between laid bare for his inspection. Perhaps the commonest sign to be missed is the small strangulated inguinal or, more especially, femoral hernia, particularly in an obese female patient. It may seem unbelievable that a patient with intestinal obstruction does not know that he has an irreducible hernia, but this is certainly the case. Indeed, I have known a distinguished doctor, seized with acute abdominal pain, who realized he had a strangulated inguinal hernia only when his physician pointed this out to him. Make it a rule, therefore, always to inspect and palpate the hernial orifices of every patient in acute abdominal pain.

At the same time one may just as well take this opportunity to feel the femoral pulses; their absence is a good clue to the rare dissecting aortic aneurysm.

Palpation is a delicate art. The heavy-handed tyro may think that the abdomen is rigid, yet the more experienced clinician will find the muscles to be relaxed under his gentler touch. There is all the difference between the voluntary and protective guarding against rough handling and the involuntary and reflex rigidity of muscles due to underlying peritoneal irritation or inflammation. An abdomen that will relax completely and allow the posterior abdominal wall to be massaged rarely harbours an acute disorder. However, constant localized tenderness and muscle spasm and the presence of release tenderness are signs which can be trusted and which usually indicate mischief beneath. The same applies to tenderness in the pelvic peritoneal pouch on rectal examination, which naturally must never be omitted.

Particular skill is required in palpation of the abdomen in children. Once the patient is hurt or frightened he cries, the abdominal muscles snap tight, and any opportunity of further examination is now lost. Utmost gentleness is essential. The child is best held in his mother's arms and the examiner's warmed hand then insinuated beneath the blanket and under the cover of soothing words. If all this fails, the young patient must be examined again after sedation with chloral.

Finally a specimen of urine is obtained and examined—especially for blood, pus, bile, and sugar.

Differential Diagnosis

It may not, indeed often cannot, be possible to make an exact pathological diagnosis—the acute abdomen is full of surprises—but at least we should attempt to diagnose the *type* of disease process which is going on. It is useful, once the clinical examination has been completed, to consider the following list of causes of intra-abdominal mischief:

- (1) Inflammation (e.g. appendicitis or diverticulitis).
- (2) Obstruction of a hollow viscus—bowel, bile duct, or ureter.
- (3) Perforation.
- (4) Haemoperitoneum (e.g., ruptured spleen or ruptured ectopic pregnancy).
- (5) Torsion of a viscus.
- (6) A vascular catastrophe (dissecting aneurysm or mesenteric occlusion).

Having determined the type of abdominal emergency, we then usually have to rely on the laws of probability to guess at the underlying disease. There is nothing really to distinguish between an acutely inflamed appendix and an acute Meckel's diverticulitis, except the first is extremely common and the second rather rare. Occasionally good luck or experience will enable the uncommon to be diagnosed, often because some small extra fact in the history or examination has been elucidated. Thus, pigment spots on the lips and buccal mucosa might suggest that the youngster with intestinal obstruction may have an intussusception of a Peutz-Jegher polyp.

An especial difficulty in late cases is that one pathological process may by now have merged into another. In particular, an inflamed or strangulated viscus may have now ruptured so that the immediate features are those of a peritonitis. Here one relies heavily on the history of the events leading up to the patient's present clinical state; a rigid belly seen within a few hours of onset suggests a primary perforation of, say, a peptic ulcer, but generalized rigidity the day following a typical Murphy sequence suggests that a gangrenous appendix has now ruptured.

Investigations

What help can we obtain from the laboratory and the radiology department in the diagnosis and differential diagnosis of acute abdominal pain? Unfortunately, although occasionally invaluable, these special investigations often yield little, if any, more information than our clinical acumen, and every now and then are frankly misleading. A very good working rule is this: if the special investigations fit in with the diagnosis made on clinical grounds, then they provide most useful confirmatory evidence; but if there is total disagreement between a laboratory test and carefully elicited clinical features in an acute abdominal emergency, then it is wise to side with the latter. Thus a raised white cell count is certainly an interesting finding and fits in well when all the other evidence points to peritoneal infection (for example, a raised temperature, signs of peritonism, etc.); but, having obtained all the clinical indications that a patient has acute appendicitis, the doctor should not budge from this diagnosis in the face of a normal white cell count. A raised serum amylase is strong supporting evidence to a diagnosis of pancreatitis, but an elevation of the amylase may occur in perforated peptic ulcer and after morphine; moreover, an overwhelming pancreatitis may be associated with a perfectly normal amylase level.

The E.C.G. and estimation of the serum transaminases are certainly helpful in the differentiation of the pain of myocardial ischaemia from an acute upper abdominal crisis such as cholecystitis.

Urine examination, which, as we have already mentioned, may be invaluable, hardly falls into the ambit of a "special investigation." It is much better regarded as merely an extension of the clinical evaluation of the patient presenting as an acute abdominal emergency and must never be omitted.

X-ray films of the chest and abdomen, taken with the patient in the erect and lying positions, may yield considerable information. Free gas beneath the diaphragm is pathognomonic of perforation of a hollow viscus, except in the post-operative period following laparotomy, when the air which has been admitted into the opened abdomen remains visible for some days. However, a minority of perforations, especially those which have sealed rapidly or where principally fluid rather than gas has escaped into the peritoneum, may not show this sign. Intestinal obstruction on radiographic examination typically demonstrates one or more distended loops of bowel with fluid levels contained therein. In theory, it is easy enough to distinguish these findings from the generalized gaseous distension of the gut in peritonitis or in the paralytic ileus which so often accompanies ureteric colic; in practice,

the two are confused with surprising ease. Furthermore, if the obstructed loop of bowel happens to be distended entirely with fluid the characteristic air bubble is absent and the involved segment of intestine is radiologically invisible. Fortunately renal and ureteric calculi are radio-opaque and can often be identified on plain abdominal x-rays; the more the pity that gallstones are visible in only some 10% of cases.

X-rays are certainly helpful in acute abdominal emergencies, but with a seriously ill and especially a restless patient it is often impossible to obtain first-class films. Under these conditions—which always seem to coincide with the middle of the night and the most junior radiographer's turn on duty—it is best to forgo this investigation.

Special Difficulties

If one asks any group of surgeons to list the real difficulties in diagnosis of the acute abdomen, they will invariably include the very young patient, the very old, the postoperative case, and the malingering.

In the infant, the history is often hard to obtain, examination is difficult, and the child's condition can deteriorate with alarming speed. The history in the elderly patient, again, may present problems, and moreover many acute conditions seem to have quite a different appearance at this age, perhaps because of the usually higher pain threshold. Acute appendicitis, for example, often gives a picture rather like that of an intestinal obstruction with vomiting, distension, generalized pain, and little fever.

During the postoperative period we contend with the background discomfort of the operation itself, the heavy sedation which has often been given, and the natural reluctance to reopen a fresh abdominal wound in the search for possible mischief within. But the patient whose paralytic ileus quietly

slips into an acute mechanical obstruction due to adhesions presents a serious problem in both diagnosis and management which is often resolved only by the most careful and often repeated examinations.

Finally, there is the malingeringer who all too often haunts our casualty departments and who has an extraordinary facility for imitating most of the acute abdominal emergencies to perfection. One man I came across could mimic a traumatic abdomen well enough to have been explored on at least two occasions. But always be on guard. There was the famous case in Scandinavia of a sailor who presented with all the features of a perforated peptic ulcer, the scars of two previous operations for the same condition, and finally a magnificent ship in full sail tattooed on his chest. The surgeon recognized this description as that of a well-known case of the Munchausen syndrome and sent him home. Unfortunately there are *two* sailors in Sweden with two scars on the abdomen and a ship in full sail tattooed on the chest; sad to say, *this* was the one with the genuine perforation.

REFERENCE

- ¹ French, E. B., and Robb, W. A. T., *Brit. med. J.*, 1963, 2, 135.

B.M.J. Publications

The following are available from the Publishing Manager, B.M.A. House, Tavistock Square, London W.C.1. The prices include postage.

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ANY QUESTIONS?

We publish below a selection of questions and answers of general interest.

Absorption of D.D.T.

Q.—*What are the toxic hazards to man of the use of sprays containing D.D.T. and other insecticides? Is there any evidence that, with the increased use of these sprays, the hazard is a real one?*

A.—Those at greatest risk from insecticide sprays are men who handle the concentrates and apply the sprays in agriculture, food storage, or disease-control programmes. The Ministry of Agriculture, through its inspectors, investigates all reported cases of poisoning by pesticide sprays used in agriculture, and cases of sickness absence among agricultural workers are also investigated to exclude poisoning by a pesticide as the cause.

Despite the increased use of these sprays there has been no upward trend in the very small number (about 20–30) of cases reported each year, and many of them are of skin irritation or splashes in the eye. The introduction of each new type of active ingredient requires renewed vigilance until its safety in use has been established, and the Ministry has powers to modify the safety precautions required during application where a need is established.

In the case of D.D.T. small quantities are taken in our diet, mainly from animal fats,

and are stored in the body fat while intake continues. Despite an increased use of D.D.T. over the past 15 years in the U.S.A. the levels in tissue fat have not risen. The average levels in those living in the U.K. are lower than those in U.S. residents, but there are not yet enough data to indicate whether these figures are changing.

Asphyxia from Bolus

Q.—*A man developed signs of acute asphyxia after inadvertently swallowing a hot potato whole. Was it more likely to have been due to the size of the bolus or its temperature, and what is the causative mechanism?*

A.—Asphyxia after “swallowing a hot potato whole” can happen only because the object becomes lodged in the pharynx or glottis in such a way as to obstruct breathing. If it were actually “swallowed” no breathing difficulty would arise. Many instances of death from this kind of accident have been recorded, most often in those who, like imbeciles, bolt unmasticated food, or in drunks whose perception of danger has been dulled.

When the bolus becomes impacted fair and square in the glottis a reflex vagal inhibition ensues and death may be virtually instantaneous, without any asphyxial, even any choking, episode. When the bolus settles into place more gently, or as a result of attempts to swallow it, a choking fight to breathe may develop, and if this is not relieved by dislodging the bolus (or by tracheostomy) a classical asphyxial death will ensue during the next few minutes.

It has always been known that to initiate a vagal inhibition only a tactile stimulus in the right spot is needed. The size or weight of it does not matter, but the “nervy” taughtness of the subject does: it may heighten the reaction.

Imipramine and Blood Sugar

Q.—*Is there evidence that imipramine raises the blood sugar in the normal and/or the diabetic subject?*

A.—It is known that certain of the phenothiazine derivatives, notably chlorpromazine, have a diabetogenic effect. It is possible that imipramine has a similar action, but it has also been suggested that imipramine decreases the need for insulin in diabetic patients. The evidence is conflicting and is discussed by Arneson.¹

REFERENCE

- ¹ Arneson, G. A., *Neuropsychiatry*, 1964, 5, 181.