How I assess the acute abdomen

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This discussion will be confined to the consideration of non-traumatic, acute abdominal pain unassociated with gastrointestinal bleeding.

Acute abdominal disease

Is sometimes diagnosed with ease. But oft the best attempts will meet
With sad and sorrowful defeat.

—from “The Acute Abdomen in Rhyme”, by “Zeta”*

How does one approach these common yet disturbing challenges to our diagnostic acumen?

It seems trite to mention the importance of taking a careful history and making a thorough physical examination, yet it is worth noting that in most diagnostic problems the history provides 70% of the information needed for diagnosis, the physical examination 20% and laboratory investigations only 10%. In the assessment of the abdomen an even higher percentage of the diagnostic information comes from the history since many acute abdominal processes have rather similar physical and laboratory findings.

The decision-making process can well be initiated by answering the following questions:

1. Is the patient ill enough to require admission to hospital?
2. Does the condition require an emergency abdominal operation, and if so, what?
3. If not, what observations are called for in the expectation of an urgent as opposed to an emergency procedure?

In deciding on the need for hospitalization it is hardly necessary to list the symptoms and signs that indicate that a person is seriously ill. Suffice it to say that the extremes are easy to identify. It is the in-between cases that pose the most demanding questions in view of the emphasis today on home care and because of the unavailability of hospital beds.

Once the decision is established that the patient is sick enough to require hospitalization, what reasoning determines the need for operation and, once this is decided, what diagnosis is entertained? An old adage suggests that we should always look first at the least obvious before examining the more obvious for fear of overlooking the real cause.

At this point a few general questions may be considered:

Question 1 — What systemic diseases can mimic the acute abdomen? These are legion but the following are most often cited:

— diabetes mellitus with acidosis
— uremia
— migraine
— periarteritis nodosa
— porphyria
— tabes dorsalis (possibly making a comeback)
— lead poisoning

In most instances to consider them is to recognize them although occasionally they may be quite confusing, particularly in children, or if they coexist with a true surgical abdomen.

Today, with the greatly increased use of various drugs such as anticoagulants, cortisone, antihypertensive agents and tranquilizers, the combination of pre-existing systemic disease and its treatment may produce, mask or imitate an intra-abdominal catastrophe, to the concern of the physician and the chagrin of the surgeon. Intestinal obstruction produced by intramural bleeding in a patient on anticoagulants, the masking of an abdominal catastrophe in a patient on cortisone, the production of peptic ulcers with perforation in patients on corticoids and the association of jaundice with pain due to sphincter spasm in the tense patient on tranquilizers, i.e. chlorpromazine, all make the life of the clinician more trying.

Question 2 — What non-surgical, non-abdominal diseases can mimic the acute abdomen?

I still use a concept I learned many years ago. I think of the abdomen as a box where the various pathological processes may have origin in any of its walls. Many of these processes are non-surgical.

Above, at the top of the box, are chest conditions that can give rise to abdominal complaints and even physical findings, e.g. pneumonia and pleurisy may be associated with guarding of the abdomen. Other cardiac and respiratory catastrophes may also be accompanied by abdominal pain but merely to think of them usually is sufficient, with a careful history and physical examination, to distinguish them from intra-abdominal problems. It is helpful to remember that, in cases of disease within the chest, even if rigidity is marked there is usually some variation in its degree with respiratory movement. Local abdominal tenderness secondary to a chest condition is not usually increased by deep palpation. If abdominal rigidity is of thoracic origin the muscles relax if the patient holds his breath with his mouth open at the end of expiration.

In the male, lesions below the box such as orchitis or torsion of the testicle may cause abdominal pain referred to the T-10 paroluminal segment. Palpation of scrotal contents is a sine qua non of examination in any acute abdomen, but particularly in patients with intestinal obstruction.

With respect to the posterior wall, such conditions as acute disc degeneration, osteomyelitis or extradural abscess can cause severe
abdominal pain. The ubiquitous herpes zoster occasionally is responsible for stabbing pain along the segmental nerves prior to the emergence of the blisters. Hypersensitivity on pinching the skin may lead one to predict the appearance of the full-blown blisters in a few days.

Anteriorly, rupture of a muscle fibre or hematoma within the rectus abdominis sheath caused by sudden movement can lead the unwary astray and initiate an operation where none is necessary.

**Question 3** — What non-surgical intra-abdominal diseases can trap the unwary?

Here one must think of the severe gastrointestinal infection that on occasion can be most difficult to differentiate from a surgical condition such as acute appendicitis in its atypical form. Retroperitoneal structures, for example, the kidneys when the site of pyelitis, can give rise to symptoms and signs not unlike those of appendicitis. One of the more difficult conditions to diagnose is pancreatitis in the absence of gall stones and presenting after the serum amylase has fallen to normal levels.

**Question 4** — What are the main pathological processes one should be prepared for on opening the abdomen?

I shall omit the enumeration of all the possible catastrophes that may occur in the abdomen and emphasize only the approach to decision-making.

No one needs to apologise for failure to make an immediate diagnosis in the Emergency Department with its chaos of activity and anxiety and cacophony of sound that at times render logical assessment most difficult. When the diagnosis of perforated ulcer or ruptured appendix is obvious the decision is simple to make, but where some doubt exists, rarely can fault be found with allowing a period of observation of one or two hours. The important “suck and drip” routine is helpful not only in permitting further observations to be made but good preparation for a planned operation. Repeated recording of pulse and temperature, urinalysis and noting of urine output, simple blood investigation, de-
termination of suction volume, observation of changes in abdominal signs and a quiet review of the history make apparent even the subtletest of obscure processes. The decision for or against operation then becomes more obvious.

What factors in the history alert one to the possibility of a surgical abdomen?

When the cause of abdominal pain is a medical one there is a tendency (although not always) for malaise and even vomiting to occur before the pain. The surgical abdomen usually manifests itself first by pain followed by vomiting and the gradual development of malaise. Although some persons vomit much more readily than others, it is true that the higher in the intestinal tract obstruction occurs, the earlier after the onset of pain does vomiting ensue.

At first the pain of the acute abdomen is often ill-defined, often generalized or midline, since it is mediated through the sympathetic division of the autonomic nervous system. The levels of innervation, for example of the gallbladder, are important to remember since the sympathetics pass via the celiac plexus up the splanchnic nerves to enter the spinal cord at T9 and account for referred pain between the shoulder blades in biliary colic or cholecystitis.

The character of the pain, poorly localized at first, changes as the reacting peritoneum comes in contact with the parietal peritoneum and therefore with the segmental nerves, becoming more sharply localized.

When a patient can accurately locate the site of the pain from the onset and is aware from the first that it hurts him to move or cough, not only is this highly suggestive of an acute surgical abdomen, but it is greatly in favour of a localized contamination, e.g. perforation of a peptic ulcer or rupture of an ovarian cyst.

On occasion, a disease process (e.g. acute appendicitis) can pass through the visceral stage while the patient is asleep and waken him only when the parietal peritoneal involvement produces sharply localized pain. Thus the usual sequence of an ill-defined pain later becoming localized may be absent in the patient who is awakened at night by localized pain in the right lower quadrant.

What physical findings in the abdomen alert us to the possibility of a surgical abdomen?

The following are listed in order of the severity of irritation they produce in the peritoneum:

a) gastric contents (most irritating)
b) bowel contents (the higher in the gastrointestinal tract, the more irritating)
c) blood

d) bile and pancreatic juice unless activated in combination or secondarily infected (when it is of the same order as b)
e) urine

As with most generalizations, there are numerous exceptions, but the old triad of abdominal pain, its association with tenderness and its increase with movement (such as pulling the belly in and out or coughing) are still valid in most instances. When, as well, there is real and not just voluntary guarding with the further observation of referred tenderness and rebound tenderness, the diagnosis is almost certain. A word of caution about the interpretation of rebound tenderness. At one time I suspect all of us have had the impression that the most important finding of the acute abdomen was the presence of rebound tenderness. However, the iconoclasts are always with us. Prout of St. Thomas's Hospital, London, studied this sign in 100 patients, particularly its relationship to other physical signs and to the subsequent course of the patients. He found little evidence that it was helpful and actually it was misleading in some cases. One is tempted to observe that the clinician didn't really know how to elicit the sign and that the usual mystical concept of "clinical experience" was lacking, but to be fair, it is quite evident that this conclusion confirms the importance of carefully building the framework of your diagnostic structure by integrating all your observations, sometimes over a period of time, and then coming to your conclusions. I would caution you that the same man must make repeated observations and record them accurately if a high level of diagnostic accuracy is to be attained.

The clinician, having correlated the information derived from the history and a full physical examination with, in some cases, radiographic and laboratory evidence, is in a position to make a single positive diagnosis. In reaching this point his thought processes may have included classifying the case as belonging to one of several general groups, viz:

1. Local and general intra-abdominal inflammation
2. The colics, intestinal, renal, biliary and even of the fallopian tube, each with its specific rhythm and timing
3. Intestinal obstruction and strangulation at various levels
4. Perforations and ruptures of viscera
5. Torsion of viscera, e.g. an ovarian cyst
6. Vascular lesions

Usually it is possible to assign a particular case to one of these categories and even establish what organ is involved. At this point a knowledge of the relative frequency of a particular pathological process can help to lead us to a specific diagnosis.

Summary

It has been said that a good clinician is one who can reach a decision based on inadequate information and be right most of the time. Nowhere is this more true than in the acute abdomen where one faces the humbling experience of immediate feedback at operation; here it is clearly established whether you were right or wrong. Each of us must work out his own approach. I have outlined some guidelines that I have found useful in maintaining a reasonable diagnostic-accuracy rate.

An astute old clinician once told me, "Don't believe everything your teachers tell you; take from each what is best for you and weave it into the fabric of your own experience". From the above discussion you may find a few threads for your own cloth.

References