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Case Studies

A Compilation of 47 Clinical Studies

By

JAMES T. McRAE, M.D.

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Medical Examination Publishing Co., Inc.
an Excerpta Medica company
969 Stewart Avenue • Garden City, New York 11530

Library of Congress Card Number
79-88721

ISBN 0-87488-002-5

August, 1979

Printed in the United States of America

SIMULTANEOUSLY PUBLISHED IN:

Brazil	:	GUANABARA KOOGAN Rio de Janeiro, Brazil
Europe	:	HANS HUBER PUBLISHERS Bern, Switzerland
Japan	:	IGAKU-SHOIN Ltd. Tokyo, Japan
Mexico, Central America, and South America (except Brazil)	: ;	EDITORIAL EL MANUAL MODERNO Mexico City, Mexico
South and East Asia	:	TOPPAN COMPANY (S) Pte. Ltd. Singapore
United Kingdom	:	HENRY KIMPTON PUBLISHERS London, England

preface

The field of emergency medicine, like so many other medical fields, is changing so rapidly that anyone who ventures to write a book about it is either very brave or very foolhardy. In no other area of medicine are rapid diagnosis and treatment so necessary as in the emergency medical services setting. This book is written primarily for the physician or nonphysician who is working in that setting, whether it is called an emergency department (ED), an emergency ward (EW) or an emergency room (ER).

It has often been said that the first clinician who sees a patient plays a critical role in the outcome of his medical care: That certainly applies to the emergency department physician. He is the person who decides whether the patient has a condition requiring urgent treatment, consultation or possible hospitalization. The physician working in an emergency department has to gain an idea quickly of what the patient's problem is and where in the course of his illness or injury he is at the moment of arrival. The traditional methods of making a diagnosis are often impossible in the emergency department, and thus, the practice of medicine in that setting requires the highest form of detective work.

The approach in this book is that the clinical evaluation, however brief and incomplete, should give the physician a working diagnosis on which to base his request for further studies. Those studies should then be done concurrently, insofar as is possible, in order to decrease the waiting time for the patient. Inevitably, that means ordering some screening laboratory studies that might not be indicated if the physician were in an office where the patient may have been seen in the past and can usually be seen in the future for follow-up.

One basic assumption of the book is that the physician has ready access to consultants in the various specialty areas of medicine and that he can admit or transfer patients for more appropriate or long-term care than he can render in the emergency department.

The book is not encyclopedic, in the sense of covering all of the clinical conditions seen in the average emergency department. Nor is it a manual of emergency medical care, the question and answer format almost completely precluding that approach. It is, rather, a review of certain information and approaches to emergency patients and some of their problems. Few techniques and procedures are given, since many books on technique are already available. This book is designed to supplement those rather than to replace them or even to build on them.

Most of the case studies were taken from the files of the North Carolina Baptist Hospital. Their selection was not easy, but was based upon my desire to include some of the most frequently seen problems in the emergency setting. I have made an effort to summarize the outcome of each case, even when most of the care of the patient took place in some area other than the emergency department.

I did not attempt to formulate the questions on a par with those used in actual examinations. Rather, my goal was to stimulate interest in the subject as well as in the care of the patient as illustrated by the case study.

I made no effort to address or resolve the broad issue of the appropriateness of general patient care in the emergency department setting. Although I do not believe in converting emergency departments into walk-in clinics, I am aware that the public has already done that to a large extent, and that hospitals and physicians are trying to learn to live with that situation and still render consistently good care in the emergency department setting. Unfortunately for good public relations, many emergency departments have a policy against follow-up in the same setting even for the same condition, such as removal of sutures. That is a policy that many patients are unaware of when they take advantage of the convenience of emergency department care.

I have not attempted to cover pediatric cases adequately here, a coverage that would require a separate book. What I have done, whenever possible, is to bring out the points relating to children in each case study, although, admittedly, I have done so rather inadequately, and at times even haphazardly.

Most of the case studies did not seem to require documentation of the statements made, since most of the statements are common knowledge. However, in a few case studies, I thought it wise to list the articles that I had found especially useful. The general reference section that appears at the end of the book lists sources that cover, in much greater detail, the problems described in this book, as well as the many clinical problems that were excluded because of space limitations.

The opinions expressed and the statements made in this book are entirely my own and do not necessarily reflect the official opinion or the recommended treatment protocol of any official body.

James T. McRae, M.D.

acknowledgments

I would like to thank the faculty and residents in Emergency Medicine at Bowman Gray School of Medicine, North Carolina Baptist Hospital and Forsyth Memorial Hospital, all of Winston-Salem, North Carolina. They have offered helpful suggestions on which clinical problems to include in this book and the particular points to bring out that will be helpful to others working in emergency departments.

My thanks also go to Mrs. Judith T. MacMillan, editor in the Department of Surgery at Bowman Gray School of Medicine, and her assistant, Mrs. Frances H. Casstevens, both of whom did far more than the usual work in typing, re-typing, revising and general editing of this material.

My special appreciation goes to my family for waiting patiently for me once more to have time available for them.

notice

The editor(s) and/or author(s) and the publisher of this book have made every effort to ensure that all therapeutic modalities that are recommended are in accordance with accepted standards at the time of publication.

The drugs specified within this book may not have specific approval by the Food and Drug Administration in regard to the indications and dosages that are recommended by the editor(s) and/or author(s). The manufacturer's package insert is the best source of current prescribing information.

contents

EMERGENCY MEDICINE

CASE 1: SEVERE MID-ABDOMINAL PAIN IN A 42-YEAR-OLD MAN

HISTORY: A 42-year-old man reported to the emergency department with severe mid-abdominal pain and vomiting of two days' duration. He had previously experienced several similar, although less severe, episodes of pain. He had consumed one pint of alcohol daily for several years. He denied having had alcohol withdrawal symptoms in the past, but had been tremulous for two days before admission. He had been shot in the abdomen two years before; the wound had been "just sewed up" and there were no complications. His appendix had been removed sometime in the past without sequelae.

Examination revealed a tremulous, agitated man in moderate distress. His pulse was 120 per minute; blood pressure, 160/120 mm Hg. There was moderate tenderness in the epigastrium and right upper abdominal quadrant. Liver was palpable 2 cm below the right costal margin. There were no other abnormal findings.

LABORATORY DATA:

Hemoglobin: 14.3 gm/dl
Hematocrit: 43.6%
White blood cell count: 9,600/mm^3 with 87 segmented neutrophils and 5 bands
Urinalysis: negative except for trace of protein
Electrolytes: within normal range
Serum amylase: 600 Somogyi units/100 ml (normal range: 50 to 150 Somogyi units/100 ml); six hours later - 450 Somogyi units/100 ml
Serum creatinine: 1.1 mg/dl
Serum calcium: 11.8 mg/dl (normal range: 8.5-10.5 mg/dl)
Serum phosphorus: 4.1 mg/dl

Total bilirubin: 1.07 mg/dl
Alkaline phosphatase: 116 I.U. (normal range: 30 to 110 I.U.)
Lactic dehydrogenase: 225 I.U. (normal range: 60 to 220 I.U.)
Serum glutamic oxaloacetic transaminase: 62 I.U. (normal range: 0 to 40 I.U.)
VDRL: Nonreactive
X-rays: Chest: bilateral atelectasis, lower lobes. Abdomen: ileus in transverse colon and splenic flexure; no calcification in the region of the pancreas.

QUESTIONS:

1. Your main working diagnosis in this patient is:
   A. Alcohol withdrawal syndrome
   B. Acute alcoholic hepatitis
   C. Acute alcoholic gastritis
   D. Penetrating peptic ulcer
   E. Acute pancreatitis

2. TRUE OR FALSE: There is more than one clinical type of pancreatitis.

3. Which of the following are related etiologically to the development of acute pancreatitis?
   A. Trauma
   B. Gallstone disease
   C. Alcoholism
   D. Recent abdominal operation
   E. All of the above

4. The most important historical features in diagnosing acute pancreatitis are:
   A. Abdominal pain, usually upper
   B. Back pain opposite the epigastrium
   C. Nausea and vomiting, usually severe
   D. Fever
   E. All of the above

TRUE OR FALSE (Questions 5-9):

5. Serum amylase elevation has been known to be pathognomonic of acute pancreatitis since 1929.

6. Urinary amylase excretion is a useful test for diagnosis of acute pancreatitis.

7. Elevated serum lipase is specific for acute pancreatitis.

8. It is usually possible to accurately predict the course of pancreatitis once the diagnosis is made.

9. Nasogastric intubation with suction is indicated in all cases of acute pancreatitis, regardless of the severity.

10. This patient was admitted to the hospital and treated with bed rest, nasogastric suction for 55 hours, intravenous fluids, and pain medication. Would any narcotic have been satisfactory for pain relief?
    A. Yes
    B. No

11. The complications of acute pancreatitis are:
    A. Paralytic ileus
    B. Hypocalcemia
    C. Pseudocyst
    D. Abscess
    E. Hypovolemic shock
    F. All of the above

TRUE OR FALSE:

12. Operation is almost never indicated in uncomplicated acute pancreatitis.

13. It is not particularly important to differentiate alcoholic pancreatitis from gallstone pancreatitis.

14. The role of anticholinergics and antibiotics in acute pancreatitis is clearly defined and they should always be used.

COURSE: This patient's serum calcium level was 10.3 mg% on the day of discharge. Blood pressure was 140/100 mm Hg on his return visit to the clinic, one month later. Further studies were planned to investigate his biliary system and the cause of his hypertension. He was advised to stop drinking. He failed to return for further follow-up visits.

ANSWERS AND COMMENTS:

1. (E) Acute pancreatitis. The others are possibilities and any of them, or any combination of them, could explain this patient's symptoms and signs. He probably does have early and mild alcoholic withdrawal symptoms (A), precipitated by decreased intake of alcohol from vomiting. However, unless fullblown delirium tremens develops, treatment can be deferred until

more important diagnostic and therapeutic steps are taken.

Acute alcoholic hepatitis (B) is suggested by both the history and the finding of an enlarged liver. However, it is unlikely that all of the patient's symptoms are related to liver derangement. Acute alcoholic gastritis (C) could have caused some of his findings, but the abdominal tenderness in this condition is usually less severe. One must always be aware of penetrating or perforating peptic ulcer (D) in this clinical setting, and the studies ordered should reflect that awareness.

The diagnosis of acute pancreatitis is often very difficult, even with the best history-taking, examination, and ancillary studies. A high index of suspicion is one of the most valuable diagnostic tools. The clinical picture of pancreatitis varies considerably from one patient to the next, and even in the same patient from one attack to the next and during each attack.

2. (True) Of the acute forms, the range of severity is from mild acute edematous (or interstitial) pancreatitis to hemorrhagic (or necrotizing) pancreatitis. Edematous pancreatitis can progress to hemorrhagic pancreatitis, although the mechanism of that progression is unknown. Acute relapsing pancreatitis is that form of the disease in which there are multiple attacks that leave no permanent pancreatic scarring. This is the picture most often associated with biliary (gallstone) pancreatitis.

Chronic pancreatitis is usually associated with alcoholism. With this form, intraductal and parenchymal calcification appears within the pancreas and usually progresses over a period of years. Most patients with chronic pancreatitis have severe chronic abdominal and back pain.

3. (E) All. About 40% of cases are associated with biliary tract disease, and 40% with acute or chronic alcoholism. The pathophysiological mechanisms in these 80% are poorly understood. Five percent of cases are associated with trauma (usually blunt abdominal), operation (usually, but not necessarily, upper abdominal), hyperparathyroidism, hyperlipidemia, or hereditary causes (often beginning in childhood). The remaining 15% of cases are classified as idiopathic.

4. (E) All. It is most unusual for a patient with acute pancreatitis not to have abdominal pain. The pain may last only a few hours and not be very severe, but it is usually present. In most instances, it is quite severe and steady, is of a boring character, and is usually located in the epigastrium and corresponding

portion of the back. If true board-like rigidity of the abdominal muscles is present, the patient is more likely to have a perforated duodenal ulcer than acute pancreatic disease.

Nausea and vomiting are almost invariably present, beginning at the same time as the pain, and are usually quite severe.

Fever is variable but frequently present, along with other symptoms suggesting inflammation in the upper abdomen.

5. (False) Although in 1929, Elman and associates[3] reported an elevation in serum amylase in most patients with acute pancreatitis, it has never been thought to be pathognomonic of this condition, and it may not even be present at a particular time in patients with known acute pancreatitis. It is one of the signs in too wide a spectrum of diseases[2] to be of definitive diagnostic value alone in acute pancreatitis. In a series of 519 patients with acute pancreatitis, Jacobs, et al.,[6] found the degree of elevation of serum amylase to be unhelpful in prognosis.

6. (True) Excretion of amylase, via the kidneys, is speeded up in the presence of acute pancreatitis. The cause is not well understood, since the increased rate of excretion persists longer than the elevation of serum amylase in patients with acute pancreatitis; in many of these patients, the level of serum amylase may be only slightly elevated or normal.[9]

The specimen to be checked should be a timed specimen, if possible, since checking a urine sample collected at random may not give definitive results. A one- or two-hour specimen is most commonly used.

7. (False) Hyperlipasemia occurs in acute pancreatitis but is not specific for it, as it does occur in other conditions, sometimes alone and sometimes concomitantly with hyperamylasemia.[2] In other words, it is no more specific for acute pancreatitis than an increased serum amylase, although it persists longer. This may be useful diagnostically in patients seen late in an acute episode, since the elevated serum amylase usually returns to normal after 24 to 72 hours.

To repeat, no one of the three usual tests, serum amylase, timed urinary amylase excretion, serum lipase, is specific for acute pancreatitis. At least one, and frequently all three, modalities are elevated early in the course of an attack and may serve as diagnostic guides. Because the diagnosis is often so elusive, it is wise to check all three in any patient with severe upper ab-

dominal pain and tenderness, unless some other diagnosis is obvious. If some, or all, are normal initially, they should be rechecked at least daily, because in some patients with acute pancreatitis, the levels may not be elevated at all, while in other such patients, they are elevated only transiently. In this patient, the diagnosis of acute pancreatitis was obvious and additional tests were not required.

The patient who has recently ingested alcohol or other drugs presents a special problem, not only in the differential diagnosis but in the extent to which the alcohol can mask pain and tenderness. In such a patient, screening tests, such as the ones described previously, are mandatory. Repeated evaluation is also essential, including key laboratory tests.

Even when all laboratory tests for acute pancreatitis are negative, it is wise not to abandon this diagnosis in the patient who has upper abdominal pain and tenderness, with associated vomiting, when no other diagnosis seems acceptable. Such patients should be hospitalized for observation and further diagnostic studies.

In summary, the following are pitfalls in the diagnosis of acute pancreatitis: (1) failure to consider pancreatitis in the differential diagnosis; (2) failure to determine enzyme levels early enough and frequently enough; (3) failure to remember that other diseases may elevate the serum amylase; and (4) labelling upper abdominal pain "functional", because it does not fit nicely into any other diagnostic category.

8. (False) The initial evaluation is often very misleading, in that the patient may become progressively sicker, or he may improve rapidly, even though he was moderately ill when first seen. Because of this unpredictability, it is safest to hospitalize the patient with acute pancreatitis and to start treatment as soon as possible.

9. (True) It relieves pain, rests the pancreas, and relieves or prevents the recurrence of ileus. Relief of pain is frequently used as the signal for removal of the nasogastric tube, provided the bowel sounds have returned to near normal.

10. (B) No. It is far better to avoid narcotics known to produce severe spasm of the sphincter of Oddi, since such spasm may make both the pain and the pancreatitis worse. The narcotic that is both effective and least likely to cause such spasm is meperidine (Demerol®), usually given in doses of 100 mg or more,