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Research Article

**EVALUATION AND MANAGEMENT OF ACUTE
ABDOMINAL PAIN IN THE EMERGENCY DEPARTMENTS**¹Dr Aqdas Qayyum, ²Dr Rida Saleem, ³Dr Mirza Mashaal Khan^{1,3}MBBS, King Edward Medical University, Lahore.²MBBS, Ameer ud Din Medical College, Lahore.**Article Received:** February 2020**Accepted:** March 2020**Published:** April 2020**Abstract:**

Aim of Study: At some points, evaluation of patients become extremely difficult when they present with acute abdominal pain issues with no other prominent disorder. Delay in the presentation and diagnosis of the issue can obscure the results and leave adverse outcomes for the patient. Multiple diagnosis techniques must be considered by clinicians, especially when the condition is life threatening and require immediate attention to limit mortality and morbidity.

This article encapsulates the general information regarding abdominal pain, and some important steps of modus operandi are discussed to minimize the uncertainty of the case. Additionally, the approach for unstable patients with acute abdominal pain has also been discussed here.

Evaluation of the emergency department patient with acute abdominal pain is sometimes difficult. Various factors can obscure the presentation, delaying or preventing the correct diagnosis, with subsequent adverse patient outcomes. Clinicians must consider multiple diagnoses, especially those life-threatening conditions that require timely intervention to limit morbidity and mortality. This article will review general information on abdominal pain and discuss the clinical approach by review of the history and the physical examination. Additionally, this article will discuss the approach to unstable patients with abdominal pain. Evaluation of the emergency department patient with acute abdominal pain is sometimes difficult. Various factors can obscure the presentation, delaying or preventing the correct diagnosis, with subsequent adverse patient outcomes. Clinicians must consider multiple diagnoses, especially those life-threatening conditions that require timely intervention to limit morbidity and mortality. This article will review general information on abdominal pain and discuss the clinical approach by review of the history and the physical examination. Additionally, this article will discuss the approach to unstable patients with abdominal pain.

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INTRODUCTION:

One of the most common reasons for a visit to emergency department is abdominal pain, which accounts for almost 7% (9 million) out of 120 million ED visits per year. No doubt, internists are skilled in the assessment of abdominal pain, but a few aspects must be kept in mind. Moreover, a common presentation of the patient with complaints of abdominal pain must be taken seriously as it might be an indicator of other underlining serious disease.

Despite sophisticated diagnostic modalities, 25% of the patients visiting ED are diagnosed with undifferentiated abdominal pain and are discharged. The follow up shows their recovery within a week. 35 to 41% of patients are admitted to hospitals for serious issues linked with abdominal pain. With the therapeutic and diagnostic advances like tomography, ultrasonography and laparoscopy, the rate of misdiagnosis of surgical emergency has still not pretty much declined.^{1,2} Most of the medicolegal actions which are taken against both general and pediatric EM physicians are due to misrepresentation and treatment of abdominal pain.^{3,4}

Abdominal case diagnosis ranges from benign to life threatening and pose complex challenges for the clinicians. The causes might be surgical, intra-abdominal, medical and extra-abdominal ailments. As the symptoms and presentation of many abdominal issues are similar, so this further complicates the situation.

Some cases as of immunocompromised older adults and childbearing women pose special diagnostic challenges leading to time consuming workups. Old and diabetic patients often have atypical, vague and non-specific complaints that can be benign or potentially fatal.^{5,6} Older patients of above 65 accounts for 20% that visit ED, 3 to 5% out of which have complaints of abdominal pain. One- half to two third of these patients are hospitalized and one- third requires surgical intervention.^{7,8}

Modus Operandi

It is imperative to note down as much history as possible of the patients because history is considered as a cornerstone of an accurate diagnosis. History must include the complete details about patient's pain and associated symptoms. Important information can also be gathered by obtaining surgical, medical and social history of the patient.

Assessment of Patient's Pain

The general mnemonic for complete pain history analysis is given below:

- P3- Position, palliating and provoking factors
- Q- Quality
- R3- Region, Radiation and Referral
- S- Severity
- T3- Temporal factor like time, progression

This mnemonic PQRST aids greatly in ensuring the thorough history assessment. It is up to the clinician that how he wants to follow the sequence. Usually, it is preferred to ask about the location of the pain, kind of pain, when and how it began, its intensity and its progression over time.

Location

Location of pain matters a lot. Visceral organs when generate afferent pulses then they are poorly localized, so visceral pain is generally known to be occurring in the midline. Vigorous contraction, distention, stretch and ischemia can stimulate visceral nociceptors. Pain will be localized in the epigastric region if it is originating from foregut organs like stomach, pancreas, liver, biliary system and proximal duodenum. Rest of the organs including small bowel, proximal third of colon and appendix fall in midgut structures and pain originating from them is perceived in the periumbilical region. Pain in suprapubic region is caused by the bladder, pelvic genitourinary organs and distal two third of colon. Aorta and kidney can generate pain in the back of retroperitoneal structures.^{4, 9} Embryology determines where a patient will "feel" visceral pain, which is generally perceived in the midline because afferent impulses from visceral organs are poorly localized.

Visceral nociceptors can be stimulated by distention, stretch, vigorous contraction, and ischemia. Pain from foregut structures, which include the stomach, pancreas, liver, biliary system, and the proximal duodenum, will be typically localized to the epigastric region. The rest of the small bowel and the proximal third of the colon including the appendix are midgut structures, and visceral pain associated with these organs is perceived in the periumbilical region. Hindgut structures such as the bladder, and distal two-thirds of the colon, as well as pelvic genitourinary organs usually cause pain in the suprapubic region. Pain is usually reported in the back for retroperitoneal structures such as the aorta and kidneys. Embryology determines where a patient will "feel" visceral pain, which is generally perceived in the midline because afferent impulses from visceral organs are poorly localized.

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Intensity

Intensity of pain can define the severity of the situation and can be a reason for a serious underlying disease. However, benign pain should not be taken lightly in old, pregnant and those patients who already have some serious illness.

Radiation and Referral Pain

Radiation and referral pain can be predicted from the neural pathways. For instance, ipsilateral scapula pain occurs due to biliary disease. Shoulder pain can occur if there is some inflammatory process or contiguous organ to the diaphragm; similar pain is also caused by Kehr's sign due to diaphragm irritation. Radiation may also depict the progression of disease such as an ongoing ureteral stone.¹⁰

Duration and Progression

Pain's duration and progression are vital points to note. Persistent progression of pain is worrisome, while a decline in pain intensity is usually favorable. Many pain patterns can aid in disease diagnosis, for example the pain migration in appendicitis. In this illness, the initial distention of appendix produces periumbilical visceral pain that shifts to right lower quadrant once the somatic sensors of parietal peritoneum detect the inflammation.

Another example of small bowel obstruction shows that how pain initially progresses from an intermittent pain to more severe constant pain on the occurrence of distention.

Provocative and Palliating Factors

It is quite vital for clinicians to ask, if anything or any action is impacting the pain in positive or negative ways like coughing or walking exacerbates or calms the pain. Pain increases with jolts and bumps in patients with peritonitis. Clinician can ask simple questions about the patient's arrival to understand the provoking factors. The patient should also be questioned about the intake of any antacids or analgesics or any other self treatments, and body's response.

Pain in the upper abdominal pleuritic region can signify some chest disease. Eating can exacerbate or relieve peptic ulcer. Intermittent pain can occur with consumption of fatty meals which can indicate the presence of gallstones, eating may also precipitate mesenteric ischemia.

Assessment of Associated Symptoms

Assessment of associated symptoms can help the clinician to diagnose the disease on time. Gastrointestinal, urinary, fever and cardiopulmonary symptoms are usually of primary focus. Patients's age and present course of illness should also be included in the clinical context.

- **Anorexia**

Anorexia is usually present in 68% of patients with appendicitis. However, the report of this symptom declines with age to 20- 44% in elderly patients.

- **Vomiting**

Vomiting may occur in any abdominal disease and in general fever, but pain precedes vomiting when the condition is surgical except in esophageal rupture due to emesis.¹¹ nature of vomiting can also aid in proper diagnosis of the illness.

For instance, in small bowel obstruction, as the illness progresses, the patient anticipates succession of gastric contents to bilious to feculent emesis. In gastric volvulus, frequent non-productive retching can be observed. Repetitive non-queasy vomiting can be a symptom of gastric outlet obstruction. In infants, queasy vomiting is considered an indicator of serious illness like intestinal malrotation. Presence of blood, bile or coffee ground emeses can indicate the liver complications.

Benign vomiting can be caused by food borne illness and is a less worrisome factor.

- **Bowel Symptoms**

Diarrhea is a less worrisome feature as long as it is benign and not progressing. However, in various diseases diarrhea is considered as one of its symptomatic factor as in appendicitis and mesenteric ischemia. Scarcely, any patient with age below 40 has ever found to have diarrhea as a symptom to any surgical condition.¹²

Moreover, diarrhea can present the colonic obstruction illness, it can also occur in small bowel obstruction. In the later, reflexive hyperactive bowel distal to the obstruction clears itself and diarrhea prolongs with partial obstruction. Blood in stool with acute abdominal pain can also raise suspicions for multiple diseases like, mucosal compromise from ischemia, melena, ruptured aneurysm or ruptured ectopic pregnancy in the young.

Physical Examination

The very first thing which should be done by the clinician upon the presentation of the patient is the keen observance of physical appearance. The person with an ill look and abdominal pain might need immediate attention and can have an undiagnosed illness. On the other hand, elder patients with fine look must also be given special consideration because they may have a serious underlying disease. Patients's position, facial expressions, respiratory pattern, spontaneous movements and voice (shivering or fine) etc., should be observed.

Abdominal Examination

After physical examination, the clinician should move towards abdominal examination. There are some limitations for this check-up and the key elements of this process must be understood.

- **Inspection, Auscultation, and Percussion**

Inspection is carried out for the detection of surgical scars, hemorrhage, liver disease (caput medusa), and skin changes as in herpes zoster. Percussion helps in observing the distended area and aids in differentiating between advanced ascites and large bowel obstruction. Auscultation has limited diagnostic capacity, but it is done to diagnose bowel obstruction by carefully observing low- high pitch sounds or the silence encountered with ileus. Small bowel obstruction, abdominal catastrophe and ileus obstruction are usually diagnosed via auscultation.

- **Palpation**

Palpation is directed primarily for localized tenderness, peritonitis identification, and detection of abnormal enlargements such as abdominal aorta. Stethoscope is advisable to be used for palpation in anxious and less cooperative patients, usually children. Localized tenderness usually indicates the underlying reasons of the pain. But, generalized tenderness makes diagnosis more challenging. If the patients are cooperative, then liver and spleen size can be assessed via palpation or percussion for pulsatile, other masses and assessment of the quality of femoral pulses. Expansile mass and a tender pulsatile are the key features of an acute abdominal aortic aneurysm.

- **Tests for Peritoneal Irritation**

The primary objective of abdominal examination is the detection of peritonitis. Multiple methods are famous for this, but usually a traditional rebound test is performed. In it, gentle pressure on the abdominal wall is applied for 15 to 30 seconds with sudden release. Then the patient is asked to score the pain on basis of depression or release.

A famous term, guarding is used which is defined as the increased abdominal wall tone. Rigidity is a prominent feature of it. It is significant only to observe involuntary reflex which is reflected during a physiological attempt to reduce intraperitoneal structures' movement. In this procedure, the examiner observes the respiratory cycle and muscle tone by flexing the knees and hips. Guarding and rigidity depends upon the age because of laxity of the abdominal musculature.

Rectal Examination

Rectal examination has various limitations, but it is carried out to observe late intussusceptions, intestinal ischemia or colon cancer. This examination, due to discomfort level, is not allowed for children. However, patients with age above 50 with nonspecific abdominal pain can undergo this examination for colon disease inspection.

Special Abdominal Examination Techniques

There are some special abdominal examination techniques performed by clinicians to observe the sign of specific diseases. A few of these special techniques are given below:

- **Carnett's Sign**

Different kinds of trauma can cause abdominal wall hematoma and tenderness, for its diagnosis this test is carried out. The point of maximal pain is checked, then the patient is asked to sit with arms crossed and the area is palpated with relaxed and tensed abdominal wall. If pain increases with the tensed wall, then it is a positive sign otherwise it is considered negative.

- **Murphy's Sign**

In this test, the examiner curl his fingers below the anterior right costal margin of the patient, and this describes cessation of inspiration in cholecystitis if the patient has it. Deep palpation of the right upper quadrant while inspiratory arrest, is also commonly performed to check cholecystitis.

- **The Psoas Sign**

When the patient is lying on their contralateral side, psoas sign is observed by asking the patient to lift the thigh against hand resistance. If the pain increases then it indicates the irritation of psoas muscle by an inflammatory process. If the pain increases on right side of the abdomen, then it is considered a sign of appendicitis. Other conditions like pancreatitis, pyelonephritis and psoas abscess will also evoke psoas sign.

- **Cough Test**

Cough test is done to observe peritoneal irritation by having cough. Cough produces sharp, localized

pain. Examiners consider different signs of pain like flinching, grimacing or patient moving his hands to the abdomen as a positive sign. It is reported that coughing increases sensitivity by 78% and aids in detection of peritonitis by 79%.¹³

Approach to the Unstable Patients

Sometimes, in the emergency department, patients present with acute abdominal pain. Immediate attention is required for ill-appearing patients with acute pain, otherwise the mortality rate rises up.

Resuscitation is usually applied to unstable patients with abdominal pain. Hypotension demands parallel process of treatment as well as early assessment for life-threatening states. Hypotension is usually apparent from blood and fluid loss from the GIT and digital rectal examination. If this aspect isn't apparent, then early examination of other abdominal spacing must be carried out, as fluid shifts into peritoneal space or bowel lumen and can cause intestinal catastrophes. Ultrasonography is useful in such conditions.

Sonographic evaluation is useful for intravascular volume status and sonography for heart and other peritoneal space observance. Severe myocardial depression can be identified via echocardiography. If ultrasound detects large amount of free fluid in abdominal cavity in younger patients, then it might be due to rupture of spleen, hemorrhagic ovarian cyst or an ectopic pregnancy. Immediate urine test is the best option for pregnant ladies. Patients with aortic aneurysm must be shifted to operating room for emergency aortic stent placement.

CONCLUSION:

Evaluation and management of abdominal pain is a perplexing task. Most of the patients have similar symptoms, pain patterns and complicating medical and social history. Many of them have benign issues that can be cured on time and patient can leave for home, but in some the situation is worrisome.

Careful examination is required to reduce the mortality rate and diagnose underlying diseases, if any is present. Clinicians must know which symptoms or pain progression is linked with the specific disease so that early detection can lead to early treatment.

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