

Decision Making Process in Acute Abdominal Pain

Haris Pandza¹, Nizama Salihefendic², Rifat Sejdinovic³, Samir Custovic¹, Samir Delibegovic², Muharem Zildzic²

General Hospital „Prim. Dr. Abdulah Nakaš“, Sarajevo, Bosnia and Herzegovina¹

Clinical Center University of Tuzla²

General Hospital Tesanj, Bosnia and Herzegovina³

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Summary

Acute appendicitis is one of the most common causes of acute lower abdominal pain. However, there are other diseases that can cause pain and mimic acute appendicitis. Some of these conditions are treated surgically; however, some of them should be treated conservatively. Therefore, the treatment of diseases associated with a number of decisions made by doctors and patients. The decision making is divided into three levels. At the first level, the patient and his family are to decide that patient should go to visit physician. At the second level is a physician in primary health care, who decides whether a patient deserves conservative or operative treatment. If he think that it is necessary to forward patient to the hospital, the other specialist: surgeons, urologists and gastroenterologists are involved in the decision making process. At the third level are decisions about the future treatment of the patient. The patient can be sent to home treatment, control exam could be appointed, patient could be operated or observed. For decision making process physicians use information collected from patient's history, physical examination of patients, laboratory tests and radiological examinations.

Key words: Acute abdominal pain, decision making process.:

1. INTRODUCTION

Despite the development of medical diagnostics the evaluation of patients with undifferentiated abdominal pain remains modest with accuracy of diagnosis of 45-50%. Computer-aided decision support (CADS) systems that use computer-generated algorithms show improvement in accuracy of 17:25% if these systems are used (1). The significant role of these systems is in the initial evaluation of the acute abdominal pain.

Pain is one of the most important reasons why the patient visits a doctor. The pain is usually a sign that there is a pathological condition in organism, although the pain may be caused by normal physiological processes (2).

Abdominal pain is usually a sign that some organ or group of organs is ill.

The character of pain in the abdomen depends on the affected organ. From all the types of pain, abdominal pain is the most common cause of hospitalization.

Visceral pain originates from the abdominal organs, which innervated by autonomic nervous system and respond mainly to the sensation caused by muscle contraction and distension. Local irritation, tearing or cutting of the organ usually does not cause pain. Visceral pain is usually vague, dull, and causes the urge to vomit. It is poorly localized and usually

in conjunction with the embryonic location and origin of organs. Structure arising from the anterior gut (stomach, duodenum and pancreas) cause epigastric pain. Small intestine, proximal colon and appendix cause periumbilical pain. Distal colon and urogenital tract are causing pain in the lower abdomen (2).

Somatic pain originates from the parietal peritoneum, which is innervated by the somatic nerves. The pain is sharp and well localized. This occurs due to irritation of the peritoneum and is usually due to the transfer of inflammation from intraabdominal organs and chemical irritation (bile, gastric contents).

Reference pain is spread far from the places of origin due to the convergence of nerve fibers. Examples are the scapular pain with biliary colic, the pain of renal colic in the groin and shoulder pain in case of the diaphragm irritation (often after laparoscopic surgeries) (2).

Many of intraabdominal disease causing abdominal pain, some are trivial while others can quickly endanger the life of the patient (abdominal aneurysm, perforated organs, mesenteric ischemia, etc.). Also, there are serious illnesses that are not so urgent and which can also be life threatening if not treated on time (appendicitis, pancreatitis, bowel obstruction, etc.).

The occurrence of acute abdominal pain puts the doctors, especially surgeons in need to make deci-

sions. One of the most common reasons why a patient comes to the doctor is the pain. Abdominal pain is the leading. The etiology of abdominal pain is diverse and its evaluation requires experience and knowledge of possible causes. In order that the patient decides to seek medical help takes some time (2).

2. THE PATIENT AS DECISION MAKER

Many factors affect when the patient will make decision to seek the help from doctors. Therefore, it is one of the parameters that we take into consideration the time from the onset to the moment when the patient reports to the doctor. Due to the nature and intensity of pain varies in different diseases and it is logical that since this parameter depends on the patient's diagnosis. This data must be interpreted in conjunction with other clinical and laboratory parameters.

The decision that the patient seeks help because of pain in the abdomen depends on many factors. One of the most important factors is the intensity of pain. If the patient has more severe pain it will come sooner to the doctor (3, 4).

Other important factors are associated symptoms. If a patient has a fever, nausea, vomiting, noticed a change in color of feces or urine, in this case will be concerned about its health even when the pain is less intense.

Family members are an important factor. Often they are very responsible to send a patient on the time to the doctor. In cases where there is an older person with a potentially dangerous disease (mesenteric thrombosis, perforated hollow organ), the time elapsed from the onset to the arrival of the doctor can decide whether a patient would survive.

3. PRIMARY HEALTH CARE PHYSICIAN AS A DECISION MAKER

One of the most critical moments is the decision made by the doctor who first comes into contact with the patient seeking help. They are usually doctors from primary health care, general practitioners, specialist of family medicine. They should based on clinical presentation, medical history and a limited number of laboratory tests decide whether to send the patient to a surgeon.

The patient may be referred to radiologists for further tests. Sometimes it is necessary to consult a gastroenterologist.

The most important decision that doctors at the ambulatory made is whether to refer the patient to a medical institution of secondary or tertiary level, or let it home with a therapy or without. Should follow-up be scheduled?

If there is doubt on the existence of acute surgical diseases the patient is referred to the hospital. The decision to send every patient with pain to a hospital can contribute to the fact that doctors at the secondary level health care have too many patients. On the other hand, the number of patients who are not famil-

iar with the hospital and had an acute surgical disease is minimized. Doctors with more experience will refer fewer patients to hospitals, while younger doctors often think that it is better to refer the patient to the hospital without a reason than to make a mistake.

Doctors in smaller cities are under much greater pressure when making decisions. They usually have only one ambulance and if they send the patient to the hospital for next couple of hours they cannot refer anyone else. Therefore, those patients are observed to collect as much information possible to make safe decision. Their decisions are taken under different conditions than the doctors who work in vicinity of the hospitals where it is possible to surgically treated patients.

4. THE SURGEON AS A DECISION MAKER

When a patient arrives to surgeon, the surgeon is faced with the fact that he/she need to make decisions. The quality of decisions depends on the data and information that he managed to collect. Our decisions seem reasonable if we manage to gather enough information from the patient. In the following example we will show how a mechanism for making decision about a patient can look like.

The patient is referred by GP because of pain in the abdomen. The patient gives the following information:

The pain started about 6 pm, first in the navel area and after a few hours spread to the right lower abdomen. Earlier mostly healthy with no allergies and serious illnesses. Had chills.

Based on the above information, we can conclude that it is most likely the case of acute appendicitis. Given that we are not hundred percent sure we want to substantiate our decision to provide more data in order to have enough relevant information for proper decision. Therefore, we do a physical examination of the patient:

The patient sensitive to palpation to the right touch ileocecal, reacting with painful grimace, the visible mucous membranes are dry, tongue is white and thickened, the skin of the patient is warm to the touch.

Now we already have a significant set of information that we believe that appendectomy is necessary. This information is cheap because invested in them is just our effort. However, we would be more secure in our decision and we will do laboratory tests, ultrasound examination of the abdomen or even a CT scan. This information is relevant and relate to our problem of diagnosis and subsequent treatment. Some doctors in situations where there is great suspicion of the existence of indications for surgery delay it because they know from experience that once these conditions resolve by themselves without endangering the patient by the fact that the actual surgery is being postponed.

5. CRITICAL INFORMATION

Of all the information that we obtain from the laboratory tests the most relevant is one that refers to

the number of leukocytes in the blood. If the value is high then it can represent the value of so-called “critical information” for the decision on surgical treatment. We could have a number of critical information, because we make more decisions. For example, abdominal pain sensitivity may be critical information to make the decision about hospitalization. On the other hand, the number of leukocytes is critical information for the surgery of the appendix (3,4).

That’s why we say that the **critical information** is really necessary information to successfully diagnosis in a particular case. It can be just one as in the example above, or may represent a critical mass of relevant informations (3, 4).

Gathering of information is the most important moment from which depends the fate of the patient. In some patients, the decision to operate a patient can be justified and beneficial or harmful to the patient if the patient does not have a disease that requires surgical treatment. During night duties the possibility of gathering information is limited by the fact that the surgeon does not have available all the resources necessary to collect all relevant information. Although CT findings are often indicated for the presence of appendicitis in our conditions are rarely an indication for surgical treatment based on CT findings. The test is too expensive and complicated to organize even during working hours.

6. ALGORITHM FOR DECISION MAKING IN PATIENTS WITH ABDOMINAL PAIN

In order to present the mechanism of decision-making algorithm was made according to which decisions are made about the treatment of patients. The algorithm is a series of steps by which we collect the relevant data necessary for the proper decision. Please note that each decision is a choice between alternatives (3, 4, 5).

6.1. History data

The algorithm shows that the first move is made from of the localization of pain. Apart from localization also essential are the time, the character of pain, spreading of the pain and its intensity.

When we consider these parameters we will be focusing on general symptoms. These are the axillary and rectal temperature, fever, vomiting, constipation, diarrhea, blood in the feces, impaired urination, menstruation, use of contraceptives, etc... So the difference between rectal and axillary temperature can give information about the acute appendicitis.

6.2. Physical findings

After an adequate history we begin with a physical examination. This review includes an inspection of the patient, his appearance, whether he have coated tongue, whether it is dehydrated, or with red or pale cheeks. Digitorectal examination can detect the presence of low-positioned tumors of the colon. Percussion can determine whether there is meteorism of the intestine.

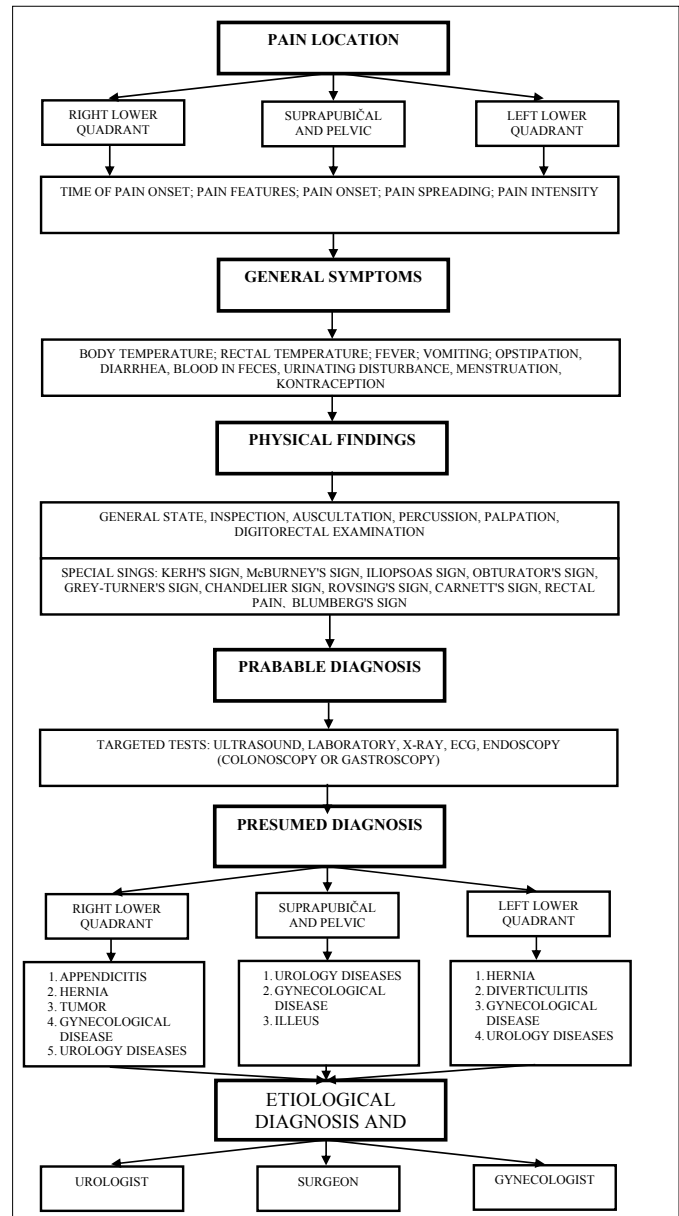


Figure 1. Algorithm for decision making in patients with abdominal pain

Specific signs may identify specific diseases that lead to the occurrence of abdominal pain. The most famous signs are Kerh sign Mcburney sign, a sign of iliopsoas, obturator sign, Grey-Turne sign, Chandelier sign, Rovsing sign, Carnett sign, rectal pain, Blumberg sign (2).

6.3. Probable diagnosis

After we finished with a history and physical examination we make decisions about diagnostic methods in order to confirm the presumed diagnosis. Always start from the tests that are cheaper and give us more relevant information. One of the decisions that the physician should make is the one refers to the need for further diagnostic procedures.

If there are no indications that the patient has an acute surgical disease the patient can go home or appointed for follow-up.

6.4. Presumed diagnosis

If we are not sure that the patient has no acute surgical disease we do diagnostic tests of which the most

important are blood tests and urinalysis findings. Increased leukocytes in peripheral blood smear show that it is the likely case of inflammatory process and contribute to the decision that the patient should be hospitalized or operated.

Abdominal ultrasound is a test that is very useful because it is noninvasive, inexpensive and provides a lot of diagnostic information. It is usually carried out by a radiologist and in some institutions, other specialty doctors (surgeons, ER specialist) trained to do this examination.

CT and MRI are the tests that are rarely used due to their cost and the fact that they are not available in most cases. However, their diagnostic value may be important in acute conditions such as appendicitis because it may show thickened wall of the appendix and other signs of inflammation.

Tests such as gastroscopy and colonoscopy are used when we suspect the existence of diseases of the gastrointestinal tract which can be differentiated by this examination.

6.5. Etiological diagnosis and targeted referral

On the basis of the examinations are set the etiological diagnosis. The patient on indication is referred to appropriate specialists. If we suspect the disease should be treated by surgeons such as appendicitis patient is sent to a surgeon. Gynecological or urological diseases are referred to urologist and gynecologist.

If doctors follow the algorithm to make decisions that will be properly made.

7. CONCLUSION

Decisions made in the treatment of patients with acute abdominal pain are made on several levels. The first level is the patient and his family who decide to send him to the medical examination. In this decision, apart from affecting the character of pain and other symptoms and signs that accompany the basic disorder.

Doctors in primary care make different decisions. There are several alternatives that are available. The patient can return home without treatment, if you

send patient back home without treatment, make findings and give the patient therapy. In case of these alternatives decision-making end at this level. However, there are alternatives that when the patient should be sent into the hospital. Even here there is a choice of hospitals and specialists to who we will refer the patient (urologist, surgeon, gastroenterologist).

The third level of decision-making is reserved for patients in hospitals. Doctors at the reception department decide which tests to do, which specialists to call. At the end of a decision on admission of patients, given therapy and whether the patient can be sent to the home treatment. The decision on surgery is the next decision, however, even here we have an alternative (3). Operate immediately or later, which surgical method to use? In the postoperative period we can also make decisions. Do we administer antibiotics? Does the patient need surgery again in case of complications?

It is evident that the treatment of patients with abdominal pain is associated with a series of decisions that can significantly affect the fate of the patient. In order that physicians can make decisions it is necessary that there are alternatives. If there are no alternatives to choose from, we cannot talk about medical decision making. So we can say that every decision is the choice among the alternatives (3,4,5).

REFERENCES

1. Cooper JG, West RM, Clamp SE, Hassan TB. Does computer-aided clinical decision support improve the management of acute abdominal pain? A systematic review. *Emerg Med J*, 2010 Nov 2.
2. <http://www.painclinic.org/aboutpain-paintypes.htm>, pristup 5.decembar 2010.
3. Masic I, Ridjanovic Z. Medical informatics, AVICENA, Sarajevo, 2002,
4. Ridjanović Z, Mašić I. Medicinsko odlučivanje. AVICENA, Sarajevo, 1994.,
5. Kern J, Petrovečki M. Medicinska informatika. Medicinska naklada, Zagreb, 2008: 211-21.

Corresponding author: ass prof Haris Pandza, MD, PhD. General hospital Sarajevo, Kranjcevic
b.b. E-mail: haris.pandza@gmail.com
