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RESEARCH ARTICLE

CLINICAL SYMPTOMS OF VISCERAL ISCHEMIC SYNDROME AND INDICATIONS FOR URGENT LAPAROTOMY

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A B S T R A C T

Acute and chronic visceral syndrome can be dramatic or slow in its onset. Early detection of symptoms and prompt diagnosis can aid the surgeon in his decision to perform emergency laparotomy. Surgical therapy includes a resection of the dysfunctional part of the intestine and the use of anticoagulant therapy. Occlusive ischemic syndrome manifests it self as an intestinal edema, loss of mucosa and a disorder of absorption in the gut. Prolonged ischemia can lead to spreading of the disease throughout the entire thickness of the intestinal wall, causing gangrene. A history of previous operations, sudden abdominal pain, without abdominal guarding, meteorism, vomiting, arterial fibrillation and laboratory parameters can define the exact time to perform a laparotomy.

The aim is to establish recognizable symptoms in the history of the illness and diagnostics. Therapeutic administration of low-molecular-weight heparin and resection of the bowel offer a better chance for patient survival.

Patients and methods: The five-year study, from 2011 to 2016, included 47 operated patients, 25 men and 22 women. The following diagnostic test were performed: electrocardiography (ECG) to prove arterial fibrillation, native radiographic recording of the abdomen (RTG) to prove intestinal dilatation and aeroliquid levels, and laboratory parameters of urea and creatinine. Symptoms of pain, vomiting and hematochezia, were included in the study. All parameters were established on the day of admission to the hospital.

Conclusion: Emergency operation in the first 24 hours of the onset provides a better survival chance. High levels of urea, creatinine, atrial fibrillation and an X-ray of the abdomen are good indicators of urgency for emergency laparotomy. Colostomy and ileostomy have proven to be procedures which give a higher chance for the patient's survival. These bowel resection methods provide relief which reduces the intestinal edema. Surgical complications of anastomoses in the intestines in the first 10 days of the post-operative period ended by performing the stoma and patient survival chances were higher with high doses of low-molecular-weight heparin.

INTRODUCTION

Constant unexplained stomach pain, abdominal distension, meteorism, nausea, discomfort can be present for a few days and weeks. Based on the history data and a clinical presentation of the thrombosis of mesenteric blood vessels, determining the right time to perform laparotomy is a difficult decision for the surgeon. Ischemia of the intestinal lining is gradual. Ischemia leads to reduced vitality of the intestine and results in an invasion of aerobic and anaerobic microorganisms. Prolonged ischemia and acute intestinal inflammation lead to gangrene and perforation of the bowel wall.

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(1) Clinically it presents rectorrhagia with dark-colored blood in the stool. The pain is sharp and strong and manifests itself in the region of the upper left quadrant of the abdomen, where the upper anastomosis and the lower artery mesenterialis are located. The patient experiences nausea, other symptoms include an occasionally elevated temperature and arterial fibrillation. There are various causes of intestinal ischemia and it is more common among the elderly. Mesenteric embolia is an embolia with a cardiac cause, standard arterial fibrillation and a myocardial infarction. It causes a sudden onset of acute pain in the abdomen with the occurrence of explosive diarrhea. Intestinal sound is variable. Peritoneal sign (tympanism), dark-colored blood in the stool are late and ominous signs of an already existing intestinal gangrene. (2,3,4) Early recognition of symptoms and rapid diagnosis can determine the start of urgent laparotomy. Surgical treatment is

the resection of the dysfunctional intenstinal part and the use of low-molecular-weight heparin as therapy. (4)

In order to establish the diagnosis of intestinal ischemia, the following are used: laboratory tests, complete blood count (CBC), C-reactive protein (CRP), urea, creatinine. Radiographic native image of the abdomen shows no occlusion for obstructed passage, but shows aeroliquid levels in the gut. Confirmation of diagnosis may also be a computed tomography (CT) of the abdomen which will show the same findings of aeroliquid levels in the gut. (5,6,7,8) Reduced absorption of liquid is caused by damage to the lining of the intestine. Indicators of decreased liquid absorption are elevated levels of urea and creatinine. ECG always shows atrial fibrillation as a result of embolization or thrombosis of mesenteric blood vessels.(2) The CT angiography is rather specific for mesenteric embolization. (9) Besides from rectal examination, blood in the stool can also be determined by flexible sigmoidoscopy and colonoscopy. The operation is strictly individual. Emergency revascularization should be parallel to a surgical treatment. (10,11,12) The type of surgery to be performed is determined intraoperatively by resecting the intestine. The intestinal part to be resected is determined by the following parameters: color, spontaneous peristalsisand, palpability of the pulse which is not always sensitive and specific for dissection. (10) Ischemia which is limited to the mucosa and submucosa provides higher chances of patient survival.

If the entire wall is affected by ischemia, this will lead to intestinal gangrene and eventually to death. Intestinal ischemia, a short-lasting stomach syndrome with a low insufficiency of mucosa in remission, when affecting large segments of the intestine can end in a colostomy. If the nutritional absorption is satisfactory, the colostomy can be surgically closed. However, if the parameters of urea and creatinine with C-reactive protein are still increased, reoperation can be performed in the next 48 hours. (7) Explorative laparotomy is generally performedon patients with exacerbated vomiting symptoms, bloody stools containing mucous and atrial fibrillation of over 130 bpm. Mortality of patients is 80%.

The aim was to demonstrate that clinical findings of meteorism, increased levels of urea and creatinine, atrial fibrillation and radiographic findings of the abdominal aeroliquid levels may affect the decision for emergency laparotomy.

PATIENTS AND METHODS

During the five-year study, from 2011 to 2016, 47 patients were operated. The medical history data described abdominal pain, vomiting, stool types, earlier operations, heart disease and hypertensive disease. Laboratory data such as CSF, CRP, urea and creatinine was provided by the laboratory diagnosis clinic at UCC Tuzla. The Institute for Radiology, Clinical Center Tuzla, provided the X-ray data, while the Department of Surgery provided the data on operations.

RESULTS

The study included 47 patients who underwent surgery. During the five years from 2011 to 2016 patients for emergency laparotomy were monitored for thrombosis of mesenteric blood vessels. There were 45 men and 22 women. They were aged between 50 and 90, with most of the patients being female and aged 70-80. (Figure 1)

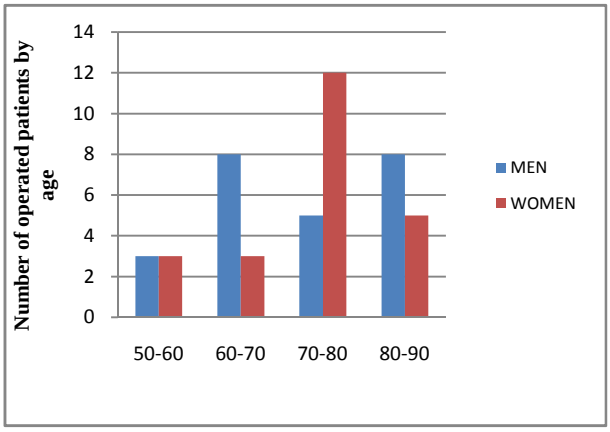

Figure 1 Distribution of patients by gender and age

On the first day of hospital admission, all of the patients reported pain in the abdomen and vomiting. ECG showed an atrial fibrillation of over 100 bpm. Regarding diagnostics, native abdominal X-rays showed aeroliquid levels in all patients with no signs of obstruction and perforation. X-ray findings were consistent with the clinical findings of meteorism and tympanism of the abdominal wall.

Explorative laparotomy was performed on 19 patients with a heart rate above 130 bpm. The same patients had urea levels over 30 mmol/L and creatinine levels up to 400 mmol/L. These parameters indicate the lowest absorption in the intestine. The operation showed complete gangrene of the small and large intestine, which ended in explorative laparotomy and a fatal outcome within 24 hours.

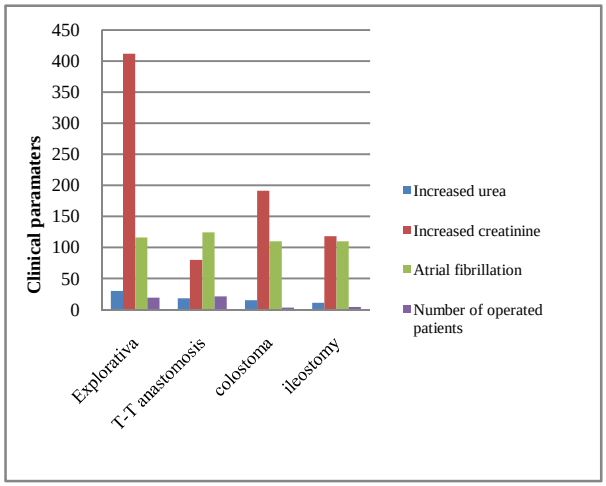

Figure 2 Clinical parameters with number and type of surgery

There were 21 patients who underwent a resection of the bowel and a T-T anastomosis of the functional bowel. This group of patients had elevated levels of urea with 9.0 mmol/L and creatinine up to 80 mmol/L. The group patients with a colostomy (3 patients) had urea levels of 18 mmol/L and creatinine up to 124 mmol/L. In ileostomy patients (4 patients) urea was 6,5 mmol/L and creatinine was 120mmol/L. Patients with colostomy and ileostomy did not vomit, nor did they had signs of blood or mucousin their stools. (Figure 2) (Table 1)

Table 1. The symptoms of the first day of hospitalization and the type of surgery

Surgery / symptoms	Number of operations	Vomit	Abdominal pain	Liquid-bloody feces
Explorativa	19	40,4%	40,4%	40,4%
T.T anastomosis	21	44,6%	34,0%	4,2%
Colostomia	3	6,3%	6,3%	----
Ileostomy	4	8,5%	-----	-----

DISCUSSION

In total 47 patients underwent emergency laparotomy, 25 men and 22 women. They were aged between 50 and 90. The study found that most operations were performed on female patients aged 70-80. Studies of other authors show the same data. (2,11,12). All 47 patients experienced symptoms of abdominal pain, while vomiting was reported by 40 patients. After the initial examination of patients with ischemic bowel disease, laboratory tests were performed and showed parameters which deviated from reference values - 2.8 to 7.2 mmol/L for urea levels and 53-124 mmol/L for creatinine. Elevated creatinine and urea levels are indicators of irregular absorption in the intestine. Explorative laparotomy was performed in 19 patients who had urea levels above 30 mg/dL and creatinine levels above 400 mmol/L. Other authors have noted different values in their studies. (7,10) Clinical examination determined the presence of meteorism, intestinal flatulence intestine with signs of tympanism in the abdomen wall, with no signs of abdominal guarding in all 47 patients. All 47 patients had atrial fibrillation of over 100 bpmon admission.

Atrial fibrillation following a thrombosis in blood vessels is described in other studies as well. (2,3,4) Native abdominal X-ray along with a CT of the abdomen showed clear aeroliquid levels without occlusion in the intestines in all patients. A group of 19 patients that underwent urgent explorative laparotomy had retrorrhagia with dark-colored, bloody stool containing mucous. The same group of patients had a fatal outcome. Other studies have also reported a high mortality rate for patients diagnosed with bowel gangrene. (6.11) Intestinal resection with T-T anastomosis due to ischemia was performed on 21 patients, whose urea levels were 9.0 mmol/L and creatinine levels up to 80 mmol/L. These patients had better survival rate, but they also experienced complications of anastomosis dehiscence and reoperation. Group of patients with a colostomy (3 patients) had urea levels of 18 mmol/L and creatinine levels up to 124 mmol/L. Ileostomy patients (4 patients) had 6,5mmol/L of urea and 120 mmol/L of creatinine. Patients who had a stoma performed had better survival chances. Monitoring stoma coloration and its function can provide an insight into the status of the rest of the intestine. High doses of heparin allowed revascularization of the rest of the bowel. Colostomy closure operations were performed two months later, while patients with ileostomy underwent closure operations after 1 month. Other studies have reported a strictly individual stoma closure timing. (13,14)

CONCLUSION

Factors which may determine the timing to perform urgent laparotomy and type of procedure include early clinical signs of pain, vomiting, retrorrhagia, meteorism, atrial fibrillation, increased levels of urea and creatinine, radiographic aeroliquidlevels in the gut. Undergoing operation in the first 24 hours provided better survival chance in patients with thrombosis of mesenteric blood vessels. All patients who had high levels of urea and creatinine and experienced a heart rate above 130 bpm underwent a explorative laparotomy and a fatal outcome. Patients who had colostomy and ileostomy, along with another intensive treatment, had higher chances of survival.

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