

## EXPERIENCE OF APPROACHING GASTROINTESTINAL BLEEDINGS IN A SICILIAN UNIVERSITY HOSPITAL

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### ABSTRACT

*The Authors illustrate the diagnostic and therapeutic guidelines utilized in the upper gastrointestinal bleedings from esophageal varices, non variceal upper gastrointestinal bleedings and lower gastrointestinal bleedings in a Sicilian University Hospital.*

*The implementation of the described protocols requires together with the involvement of a surgeon the work of a gastroenterologist and, often, of an anesthesiologist and an interventional radiologist.*

**Key words:** Upper gastrointestinal bleeding; lower gastrointestinal bleeding; endoscopy; embolization.

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### Introduction

Gastrointestinal bleedings can be either acute or chronic. Acute ones account for about 15% of all gastrointestinal bleedings and are defined as bleedings that determine a significant alteration of vital signs, often leading to blood transfusions. They have an incidence of 170 cases per year per 100,000 adults and are responsible of 1-2% of all hospital admissions. Patients above 65 years (50% of cases), often with associated diseases, are the most affected and also for this reason mortality is still quite high today, averaging out at 15-20 % of cases<sup>(1,2,3,4)</sup>.

In order to limit this incidence and obtain better survival rates, if not complete cure, a close cooperation between anesthesiologist, gastroenterologist, radiologist and surgeon is considered crucial today. The latter is now involved less frequently than in the past, namely in 5-10% of cases,

since often the gastroenterologist or radiologist can stop the bleeding; when the surgeon is called into question, his intervention is decisive to save the life of the patient.

Gastrointestinal bleedings are divided into upper and lower. The first are those secondary to disorders of the gastrointestinal tract above the Treitz ligament (mouth, esophagus, stomach and duodenum), the latter are secondary to diseases in the section below the same ligament (jejunum, ileum, colon, rectum, anus). The upper, or higher, gastrointestinal bleedings are more common, occurring in about 85% of cases; the lower ones are less frequent and generally have a more positive prognosis (less blood loss).

The following lines analyze the causes and the different ways in which the two types of gastrointestinal bleeding take place. Diagnostic and therapeutic algorithms are also introduced in order to make faster and easier the approach to these

patients who are often in very critical conditions when they enter the emergency room.

## Matherial and methods

The experience on the field of our group, which has been working for three decades on first aid and emergency surgery, has induced ourselves in the construction of guidelines which should facilitate the approach toward gastrointestinal bleeding at our department and, hopefully, also in other emergency departments.

To reach this aim, we compared our experience on gastrointestinal hemorrhage with others reported in the literature, examining above all the papers of last ten years and the articles which proposed guidelines and algorithms<sup>(5,6,7)</sup>, based on large experience on this field.

## Upper gastrointestinal bleeding

The main causes of upper gastrointestinal bleeding are: gastric or duodenal ulcers, acute erosive gastritis (usually secondary to anti-inflammatory drugs or alcohol abuse), esophageal and/or gastric varices (usually secondary to liver cirrhosis with portal hypertension), tumors (esophageal, gastric or duodenal), reflux esophagitis, Mallory-Weiss syndrome, vascular malformations<sup>(8,9)</sup>.

The upper gastrointestinal bleeding occur with hematemesis (vomiting of dark red or blackish blood) and/or melena (emission of black tarry stools). In cases of copious bleeding these symptoms may be associated with hypotension, tachycardia, unconsciousness, abundant sweating, pale skin, or the symptoms of hypovolemic shock.

A quick anamnesis recognition, possibly carried out with the help of family members, may reveal already known diseases (ulcers, gastritis, liver cirrhosis, hiatal hernia with reflux) or important information (excessive intake of anti-inflammatory drugs without protection with proton pump inhibitors or alcohol abuse).

Physical examination can show signs of liver cirrhosis (abdominal distension by ascites, periumbilical teleangectasias, flat or protruded umbilical scar), gastritis, gastric or duodenal ulcer (pain in epigastrium and/or right upper quadrant) or tumors (upper abdominal mass).

Blood analysis are used to calculate the amount of blood lost (complete blood count with hemoglobin, hematocrit and red blood cell count),

check the patient's clotting ability (prothrombin time, partial thromboplastin time, prothrombin activity, international normalized ratio), also through the values of liver function (alanine aminotransferase, aspartate aminotransferase, serum albumin), and to evaluate the patient's kidney function (blood urea nitrogen, creatinine).

When a patient reaches the emergency department of a hospital with an acute gastrointestinal bleeding it is recommended to prepare two intravenous accesses and start the administration of crystalloid solutions at high speed<sup>(10,11)</sup>. In the meanwhile blood is sampled for the laboratory tests to determine the blood group and to perform the test of compatibility in case blood transfusions are necessary.

The patient's vital signs (blood pressure, heart rate, oxygen saturation, urine output, electrocardiogram track) are monitored, while the anesthesiologist decides whether to make more maneuvers (sampling for blood gas analysis, isolation of central venous line, blood transfusions, plasma or platelets, tracheal intubation)<sup>(10,12)</sup>.

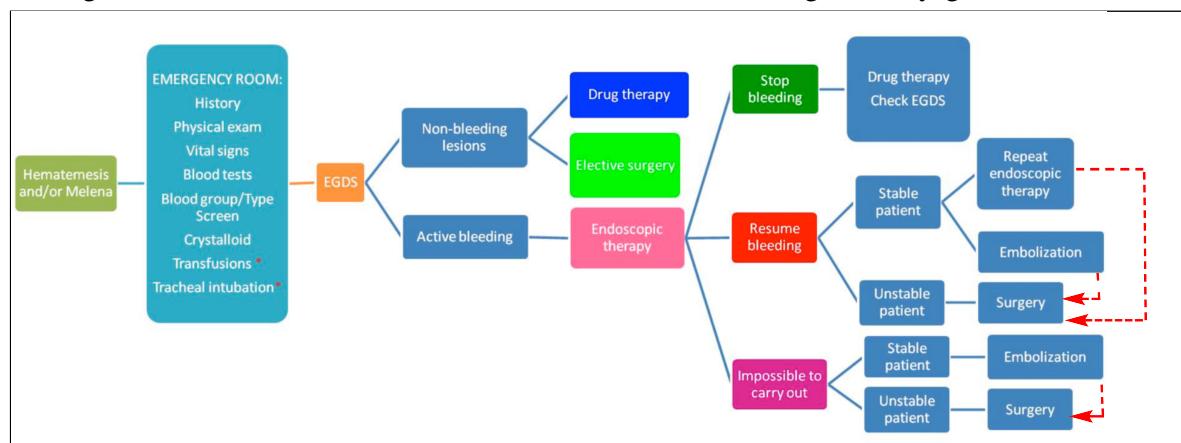
At this point it is crucial to ask a gastroenterologist to perform an esophagogastroduodenoscopy (EGDS) that, depending on the extent of the bleeding, should be carried out within 1 hour (emergency) or within 12 hours (urgency)<sup>(10,11)</sup>.

This exam, but most of the times the simple anamnesis and the first physical examination, direct us towards two main categories of upper gastrointestinal bleeding: bleeding from esophageal varices (and/or gastric) and non variceal bleeding (peptic ulcer, gastritis, tumors etc.). This first distinction is important because the diagnostic and therapeutic process is very different in the two cases, as we will see.

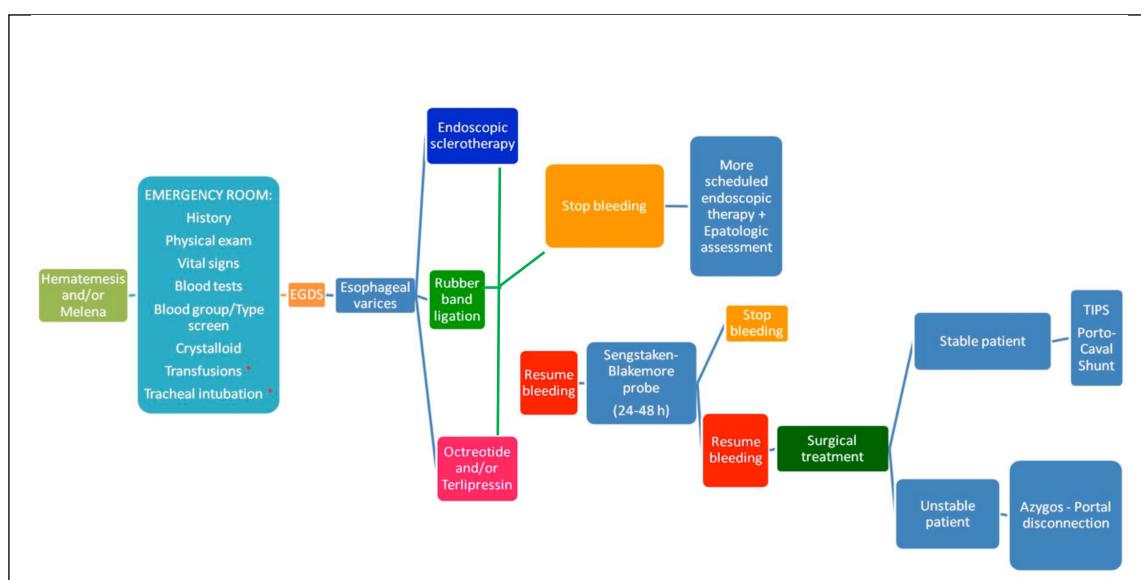
In non variceal bleeding (Fig. 1) the first EGDS will show whether bleeding is active or not. In the case of a non bleeding lesion (ulcer, gastritis, esophagitis) it is sufficient to start a drug therapy (proton pump inhibitors, magnesium-aluminum, antibiotics if there is evidence of helicobacter pylori) associated with fasting for some days<sup>(10)</sup>. The discovery of a tumor almost always leads toward an elective surgery treatment after evaluation of the histological nature and staging.

When the EGDS shows an active bleeding a hemostatic therapy is carried out, unless technical difficulties or failure to display the hemorrhagic source (torrential or oozing bleeding). In most cases this consists of a diluted adrenalin injection (vaso-

constrictor action) around and below the bleeding lesion; alternative methods are represented by thermocoagulation and the placement of surgical clips on the damaged vessel<sup>(13,14,15)</sup>.



**Figure 1:** Non variceal gastrointestinal bleeding.



**Figure 2:** Variceal gastrointestinal bleeding.

The endoscopic hemostasis results in stopping bleeding in 90% of cases; thereafter patients are treated with oral drug therapy and endoscopic follow-up (with possible biopsy). When the endoscopic therapy fails and the bleeding continues or resumes after a short time either an aggressive surgical approach or a conservative one must be taken into consideration. The first approach is recommended when the patient is in unstable hemodynamic conditions, the bleeding is copious, 4-5 units of blood have already been transfused and it is esti-

mated that the patient has already lost more than two liters of blood. Surgical treatment will consist in ulcer suture, ligation of the arteries responsible for the bleeding (usually gastroduodenal artery

and/or gastroepiploic artery) or, if necessary, in the subtotal or total gastrectomy.

A conservative approach can be chosen when the patient presents stable hemodynamic conditions and the bleeding has been limited; in these cases a new attempt of endoscopic hemostasis and an angiographic embolization of the bleeding vessel can be considered<sup>(10,11)</sup>. It is clear that if such treatment fails the patient must be taken to the operating room<sup>(16)</sup>.

The embolization and surgical treatment are also the only two valid options when the endoscopic treatment has not been possible during the first endoscopy, either because of technical difficulties (stricture, food residues) or because of failure to display the hemorrhagic source. Also in these cases it is recommended to attempt a surgical procedure for hemodynamically unstable patients and consider instead embolization in more stable patients.

In varicose bleeding (Fig. 2), the best treatment is now represented by the injection of sclerosing agents (cyanoacrylate, polidocanol) or sclerotherapy. Less used is the rubber band ligation of venous gavoccioli. In combination with these methods or waiting for a gastroenterologist to be available (at night or on holidays) it is useful to administer octreotide and/or terlipressin to reduce the amount of bleeding<sup>(17)</sup>.

If sclerotherapy succeeds in stopping the bleeding, the gastroenterologist programs further elective treatment sessions, at the same time recommending the patient to undergo hepatology visits to control the underlying disease (usually cirrhosis) with drug therapy or to take into consideration a liver transplant.

If sclerotherapy fails a Sengstaken - Blakemore probe for 24-48 hours is placed and infusion of octreotide and terlipressin may be continued or not according to the doctor's personal evaluation. After the extraction of the probe, if the bleeding has stopped, it is sufficient to program the sessions of sclerotherapy and some hepatologic analysis.

If instead bleeding resumes, like for the patients who need repeated ( $> 4$ ) blood transfusions or have persistent hypotension ( $< 70$  mm Hg) and tachycardia ( $> 100$  b/m) during hospitalization, a surgical treatment is required. In hemodynamically unstable patients it is better to run an azygos-portal disconnection with or without esophageal-gastric transection and termino-terminal anastomosis; in stable patients a transjugular intrahepatic portosystemic shunt (TIPS)<sup>(18)</sup> performed by an angio-radiologist and a portacaval or splenorenal shunt with laparotomy are two options to be considered. In subsequent inspections, depending on the stage of liver cirrhosis, liver transplantation must be considered<sup>(19,20)</sup>.

### **Lower gastrointestinal bleeding**

The main causes of lower gastrointestinal bleeding are: diverticular disease, malignancies (at

the level of the small intestine, the colon or rectum), inflammatory bowel disease (ulcerative rectocolitis, Crohn's disease), angiodyplasia (more common in the elderly), acute ischemia (small intestine or colon), the abuse of drugs with anticoagulant effect (anti-inflammatory drugs, heparin, dicumarolici), diseases of the anal region (hemorrhoids, fissures).

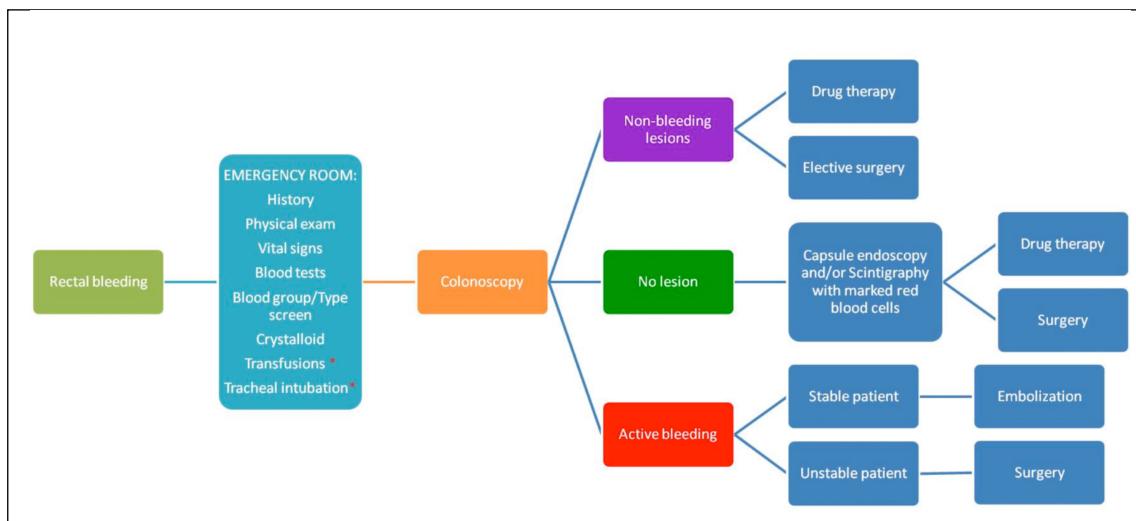
The lower gastrointestinal bleedings occur with rectal bleeding (release of bright red or dark red blood from the rectum). Compared with upper tract bleeding, lower gastrointestinal bleeding are more limited and often stop spontaneously. In fact, the status of hypovolemic shock, with the list of symptoms already described, is found only in 20% of patients who are admitted to the emergency room, compared with 35% of patients with gastrointestinal upper bleeding. Also the demand for blood transfusions is significantly lower in the lower tract bleedings (about 35% vs. 65%).

The medical history may reveal the presence of diseases previously diagnosed, potential causes of rectal bleeding (ulcerative rectocolitis, Crohn's disease, aortic aneurysm, diverticulosis, coagulopathy), the use of anticoagulant drugs or the recent onset of major symptoms (eg. weight loss and alterations of bowel, often related to the presence of an intestinal neoplasia).

Physical examination may highlight abdominal masses indicating a neoplastic or inflammatory disease (Crohn's disease, diverticular inflammation) or, through rectal examination, can identify the presence of hemorrhoids, fissures or tumors (polyps, cancer). Blood tests (blood count, coagulation tests, creatinine, transaminases), like for upper bleedings, indicate the amount of blood lost by the patient, his clotting ability and liver and kidney function.

After the first resuscitation treatment is performed by the anesthesiologist (preparation of two venous access lines, administration of crystalloid solutions, close monitoring of vital signs, possible blood transfusions), and after making sure that bleeding from the rectum is not coming from the upper tract by placing a nose-gastric tube and observing the color into the collection bag, the gastroenterologist is required to carry out a colonoscopy preferably within the first 12 hours<sup>(21)</sup> (Fig. 3).

This examination is certainly more reliable if in the meantime the bleeding has stopped, or if the patient's conditions have made possible a bowel



\* if necessary; EGDS= Esophagogastrroduodenoscopy; TIPS= Transjugular Intrahepatic PortoSystemic Shunt

**Figure 3:** Lower gastrointestinal bleeding.

preparation. If colonoscopy can identify the cause of rectal bleeding (eg. tumor, angiodysplasia, diverticular disease, hemorrhoids) and no active bleeding is detected, or the bleeding is modest, an appropriate therapy is performed, pharmacological and/or delayed surgical, possibly after accessory diagnostic investigations (biopsy, abdominal computed tomography or other).

If colonoscopy is negative and there is no sign of bleeding, the cause of rectal bleeding should be investigated in the small intestine through targeted examinations, in particular capsule endoscopy<sup>(22,23,24)</sup> and scintigraphy with marked emazies, and then start the most appropriate therapy, medical or surgical, depending on the detected pathology.

When colonoscopy shows an active bleeding, whether the cause is identified or not, angiography with possible embolization of the bleeding vessel must be performed<sup>(25)</sup> or, in the case of unavailability of an angiography suite, the patient is taken to the operating room for emergency surgical laparotomy.

Surgery is strongly recommended in bleeding causing hemodynamic instability or when repeated blood transfusions are necessary to maintain the vital signs within acceptable limits.

## Conclusions

Gastrointestinal bleeding are responsible for 1-2% of all hospital admissions with a mortality rate of 15-20%. In order to optimize the time since the patient has access to the emergency room different diagnostic and therapeutic strategies have been sug-

gested. After a quick medical history, our protocol consists in physical examination of the abdomen and a blood sample (laboratory and blood group), a resuscitation treatment, if necessary, and performance of an endoscopy (esophagogastrroduodenoscopy in case of hematemesis or melena, or colonoscopy in the case of rectal bleeding).

Hemodynamically stable patients, in whom EGDS and colonoscopy showed no cause of the bleeding, may be subjected to capsule endoscopy, scintigraphy with marked emazies or angiography. The therapy aims primarily to the arrest of bleeding which can be obtained, depending on the cause, with simple administration of drugs or with endoscopy, angiography (embolization) or surgery. An immediate activation of diagnostic and therapeutic procedures and an effective team-work among anesthesiologist, gastroenterologist, radiologist and surgeon is absolutely crucial to limit the death rate<sup>(26)</sup>.

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