Research Article

Gastroenterology, Hepatology & Digestive Disorders

Review of Endoscopic Management of Upper Gi Bleed

Hallal Mahmoud M.D*, Matar Rasha M.D, and Sanyour Joyce M.D

Department of Gastroenterology and Hepatology, AlZahraa University Medical Center, Beirut, Lebanon.

*Correspondence:
Hallal Mahmoud, Department of Gastroenterology and Hepatology, AlZahraa University Medical Center, Beirut, Lebanon, E-mail: hallalmahmoud@yahoo.com.

Received: 07 July 2018; Accepted: 21 July 2018

Citation: Hallal Mahmoud, Matar Rasha, Sanyour Joyce. Review of Endoscopic Management of Upper Gi Bleed. Gastroint Hepatol Dig Dis. 2018; 1(3): 1-4.

Upper gastrointestinal hemorrage, common problem worldwide, had an estimated annual incidence of 40-150 cases per 100 000 population [1] with 300 000 hospital admissions annually in United states and 3.5 % to 10% mortality rate [2].

The non variceal etologies are the most common cause of UGIH with 28% to 59% for peptic ulcers [3,4]. The other causes include mucosal erosion, Mallory-Weiss syndrome, Upper GI tract malignancy, Dieulafoy lesions, anastomotic ulcers, Watermeon lesions and others.

The endoscopic procedures are the first line therapy for UGIH with mechanical monotherapy or combination with injection therapy. These modalities recude the rebleeding, the need for surgery and the mortality rate.

The primary goal in GI bleed is the immediate assessment of hemodynamic status and the severity with prompt intravascular volume replacement by crystalloid fluids if needed, and restrictive red blood cell transfusion for a target

hemoglobin 7g/ dl and 9g/dl for cardiac patient [4]. The assessment of bleeding acuity, location, morbidities and coagulopathy should be added.

Several scores are validated for risk stratification than can aid clinical decision for urgent intervention and triage patients to in-hosptal vs out-of-hospital management. Two most widely validated score were Glascow Blatchford Score (GBS) and Rockall score [4,5]. GBS uses data on urea, hemglobi levels, SBP, pulse, presentation with melena, syncope, history of hepatic disease and history of heart failure [4]. Whereas Rockall score uses age, comorbities, SBP, pulse, diagnosis and major stigmata of recent hemorrhage [5].

In addition, the Forrest classification was developed 40 years ago to classify the ulcers bleeding and helps to stratify of further bleeding and identify the therapeutic strategy [6,7].

Prior to Endoscopy, high dose IV PPI, IV bolus of 80mg followed by 8mg/h should be initiated in patients with non-variceal UGIB before endoscopy to decrease the stigmata of hemorrhage but has no effect on rebleeding, need for surgery and mortality demonstrated by Cochrane meta-analysis [8].

A retroscpective analysis in more than 400 000 patients with NVUGIB reported an increase mortality in patients who underwent endoscopy after 24 hours [9]. Following hemodynamic resuscitation, ESGE recommends early (≤24 hours) upper GI endoscopy. Very early (<12 hours) upper GI endoscopy may be considered in patients with high riskclinical features, namely: hemodynamic instability (tachycardia, hypotension) that persists despite ongoing attempts at volume resuscitation; in-hospital bloody emesis/nasogastric aspirate; or contraindication to the interruption of anticoagulation [4].

Endoscopic hemostasis can be achieved using injection, thermal, andmechanical modalities. Starting by injection therapy, epinephrine injection (0.5-2 ml of 1:10 000 or 1:20 000 epiniphrine) is effective for primary hemostasis but inferior to other endoscopic hemostasis monotherapies [10,11]. The combination therapy with epinephrine decrease the rebleeding rate and emergency surgery as compare to monotherapy but no change in mortality rate [12].

Slerosants injections, ethanol, ethanolamine and polidocanol can be used to decrease blood flow and cause direct injury to the tissue and thrombosis of the vessels to stop bleeding. It decrease the need for surgery, further bleeding and mortality; but can cause tissue necrosis, pancreatitis and perforations [4,13]. Other injectable

modality can be used like thrombin, fibrin and cyanoacrylate glues.

Thermal therapy can be divided into contact and non contact device. Contact thermal therapy, heater probe or bipolar electrocoagulation, was significantly more effective than no endoscopic hemostasis in primary hemostasis, rebleeding, need for surgery and mortality [10].

Heater probe cause coagulation of blood vessel by vasoconstriction, activation of the coagulation cascade and tissue edema. 15-30 J is delivered by constant energy, relatively inexpensive and portable, efficacious and safe [14]. Another contact thermal therapy, the bipolar electrocautery, produce heat by the passage of an electical current through the tissue. Hemostasis can be achieved with the application of 15 to 20 W for 8 to 10 seconds [15].

Small RCTS showed that non contact thermal therapy, Argon plasma cogulation (APC), similar in efficacy to injection of sclerosants and contact thermal therapy (10). APC is more complex and costly than the standar heater probe [10].

Other than injection and thermal therapy, mechanical hemostasis play an important role in variceal and non variceal upper gastrointestinal bleeding.

Endoscopic clips "through- the scope" clips achieve hemostasis by mechanical compression.The Risk of recurrent bleeding was significantly reduced after using mechanical therapy. Five metaanaylsis were done comparing mechanical therapy using endoscopic clips vs injection monotherapy and the superiority to endosclips was siginificant [16].

The clip is drawn into the tube sheath, allowing it to be passed through the accessory channel of the endoscope. At the target tissue, the clip is advanced out of the sheath, oriented and deployed as directed by the physician and typically slough off within days to weeks after placement.

Multiple factors can affect adversely the placement of an endoscopic clip these include the difficult to access lesions regarding the anatomy "for example an ulcer in the lesser curvature or posterior wall of the duodenum", large blood vessels > 2mm, and hard indurated or fibrotic base ulcer [17]. Different types of clips are available and they are differ in their ability to rotate, re-opened, re-positioned, inaddition to the difference in the opening width and jaw length [18].

Another mechanical modality used for variceal bleeding is the endoscopic band ligation. It's aim is to produce mechanical compression and tamponade on the tissue and the varice by placement of elastic band [19]. When comparing to endoscopic sclerotherapy, the endoscopic variceal ligation is superior in all major outcomes: time to eradicate the varices, recurrent bleeding, local adverse events including ulceration and stricture formation and survival [20].

In patients failing to respond to initial endoscopic therapy, the adaptation of new endoscopic hemostatic devices is promising in improving the patient outcome.

Similar to Band Ligation the Cap-mounted clips "Over-the scope Clip System" is released by using a hand wheel, and the advantage of such clip is that it allow to suction a large amount of targeted tissue, mainly used in anastomotic bleeding, in difficult to access lesions and ulcers " posterior wall of the duodenal bulb" , hard fibrotic and indurated ulcers, gastric Dieulafoy lesion, post-biopsy and post-polypectomy bleeding or when initial endoscopic therapy failed, inaddition to its main indication in the closure on perforations and fistulas [21-23].

Hemospray is an inorganic powder was used initially as a first aid-kits by the military to control the hemorrhage. It forms a mechanical barrier over the bleeding site. it is an absorbent and acts as a serum separator resulting in high concentration of clotting factors activates the intrinsic clotting cascade [24].

The Spray is Delivered through a non-contact catheter resulting in an easy technique especially in covering lesions in difficult locations, inaddition to its ability to cover a wider surface are, without focusing on a precise target lesion [24].

Ankaferd Blood Stopper (ABS) is approved in turkey for topical treatment of external bleeding. It is a mixture of extracts from several plants [25]. Its main advantage is in the formation of an encapsulated protein mesh that allow rapid aggregation of the erythrocyte [25]. The ABS solution is delivered through a spray catheter to the bleeding site resulting in the formation of an adherent yellowish coagulum [25].

Cyanoacrylate (CYA) Spray is a spray technique that can be used as an alternative method in emergent settings for uncontrollable GI bleeding. Cyanoacrylate is a synthetic rubbers, once contact with blood " weak base" it will leads to an exothermic reaction and thus rapid polymerization. In endoscopy, there are two forms used : Enbucrilate (N-butyl 2-cyanoacrylate; Histoacryl) which is widely used in variceal bleeding and is FDA approved, and Acrylate (2-octyl cyanoacrylate) (26, 270. The disadvantage of such technique is that the permanency of the CYA can destroy endoscopic equipment thus its advised to use with appropriate precautions [26,27].

Placement of a fully covered self expandable metallic stent (FCSEMS) is indicated after failure of routine hemostatic modalities in controlling the post-sphincterotomy bleeding and balloon sphincteroplasty bleeding [28-30]. FCSEMS placement in the esophagus was studied in patients with esophageal variceal bleeding refractory to conventional endoscopic techniques "band ligation"and vasoactive drugs, and patients who are unable to undergo transjugular intrahepatic portosystemic shunt "TIPS" because of patient instability, and the result was promising especially comparing to Balloon tamponade "BT"where SEMS was superior to BT in outcome regarding oral nutrition, patient

mobility, incidence of aspiration pneumonia duration in hospital [28-30].

In their most recent consensus report the BAVENO VI committee has recommended that SEMS be considered as an alternative to balloon tamponade [28-30].

Finally, second look endoscopy (within the next 24 hours) should not be performed routinely after each episode of GI bleeding with effective hemostasis. With poor initial endoscopic visualization, suboptimal initial endotherapy, clinical evidence of recurrent bleeding patients with persisting high-risk endoscopic stigmata, second look endoscopy showed to decrease the rebleeding rate in high risk patients and decrease mortality [31].

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