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Endoscopic band ligation, and Argon plasma coagulation Yields in management of Post-Hepatitis Portal Hypertensive Gastropathy

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Abstract

Background: Portal hypertensive gastropathy (PHG) refers to the visible alterations in the stomach that occur due to the dilatation of blood vessels in the mucosal submucosal layers, as observed during an upper endoscopy.

Aim: To compare Endoscopic band ligation (EBL), Argon plasma coagulation (APC), and combined (EBL) & (APC) in the management of severe PHG associated with post-hepatitis liver cirrhosis.

Patients and methods: This research performed on 108 cirrhotic individuals had overt or occult bleeding from severe PHG attending the Hepatology, Gastroenterology & infectious diseases Department, Al Azhar university hospitals, from June 2021 till June 2022. individuals were separated into three groups: Group I: 35 patients underwent APC sessions, Group II: 37 patients underwent (EBL) only, and Group III: 36 patients underwent combined sessions of APC and EBL.

Results: There was statistically significant variance among the examined groups concerning the improvement of post-treatment hemoglobin level, with no statistically significant variance regarding post-treatment hospitalization, transfusion, and incidence of endoscopic complications. Regarding the pre-and post-treatment hemoglobin level improvement in overt bleeding patients, There was a statistically significant variance, while in occult bleeding individuals, there was no statistically significant variance.

Conclusion: APC, EBL, and combined therapies are all effective procedures in managing severe PHG with no major endoscopic complications. In overt bleeding patients: Combined therapy of APC and EBL showed more superiority over APC and EBL alone. In occult bleeding patients: All procedures are effective, with no superiority of any procedure over the others.

Keywords: PHG, APC, EBL

1. Introduction

PHG refers to visible alterations in the stomach's mucosal and submucosal blood vessels, which can be observed during an upper endoscopy. PHG arises as a consequence of either cirrhotic or non-cirrhotic portal hypertension. PHG is of clinical significance due to its potential to induce immediate, substantial, or gradual hemorrhage.¹

The pathophysiology of PHG still needs to be fully comprehended. Nevertheless, as indicated by its name, PHG necessitates the existence of portal hypertension. Research has demonstrated that a hepatic venous pressure gradient (HVPG) of 12 mmHg or more is linked

to PHG. Furthermore, individuals with severe PHG had a larger HVPG compared to those with mild or no PHG. Furthermore, additional consequences of liver insufficiency may probably play a role. According to Kumar et al., there is evidence indicating that individuals with PHG have better cardiac output and lower systemic vascular resistance.²

The primary focus of PHG management is to decrease portal pressure, primarily via medicinal treatment rather than endoscopic methods. Nonselective beta-blockers are the primary treatment for reducing portal pressures, especially in individuals with persistent gastrointestinal bleeding caused by PHG.³

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APC is a novel method of non-contact electrocoagulation that utilizes high-frequency electronic radiation to induce specific thermal effects in tissue. This technique may be employed for both thermal devitalization of the tissue and achieving hemostasis. Argon plasma coagulation is a highly successful method for obtaining endoscopic hemostasis in cases of portal hypertensive gastropathy.⁴

Multiple sessions of argon plasma coagulation are needed to achieve complete and sustained endoscopic improvement of severe portal hypertensive gastropathy.⁵

EBL is commonly used as a successful and established therapy for esophageal varices due to its ability to eliminate submucosal varices.⁶ A few reports indicate EBL's usefulness in managing gastric antral vascular ectasia (GAVE) and PNG.⁷

The research aimed to compare EBL, APC, and combined (EBL) & (APC) in managing severe PHG associated with post-hepatitis liver cirrhosis.

2. Patients and methods

This research was performed on 108 cirrhotic individuals who had overt or occult bleeding from severe PHG attending the Hepatology, Gastroenterology, and Infectious Diseases Department, Al Azhar University Hospitals (Al Hussein & Sayed Galal Hospitals) from June 2021 till June 2022. These patients were separated into three groups: Group I (APC group): Thirty-five cases were subjected to APC sessions for treatment of severe PHG, Group II (EBL group): Thirty-seven patients were subjected to endoscopic band ligation sessions only (EBL) for management of severe PHG and Group III (Combined therapy group): Thirty-six patients were subjected to combined sessions of APC & EBL for treatment of treatment of severe PHG.

Inclusion criteria: Patients with post-hepatitis liver cirrhosis who present with upper gastrointestinal tract (GIT) bleeding or anemia with severe PHG on esophagogastroduodenoscopy (EGD) and patients with post-hepatitis liver cirrhosis who will undergo elective EGD that reveal severe PHG.

Exclusion Criteria: Refusal to participate in the study, pregnant females, patients with Peptic ulcer diseases, patients on anticoagulants or antiplatelets, patients with chronic renal failure presenting with anemia or GIT bleeding, patients with GIT malignancies and patients with mild PHG.

Ethical Aspects: The protocol has received approval from the Committee of Tropical Medicine Department and the Committee of Faculty of Medicine at Al-Azhar University, followed by the ethics committee at Al-Azhar University. Every

individual enrolled in this investigation provided their informed permission, which was accepted by the ethics council of Al-Azhar University. They were adequately informed about the procedures and possible advantages and risks.

Methods:

Naïve patients received carvedilol as a treatment for portal hypertension, as continuing the study without adding Beta-blockers therapy to them was unethical.

All cases were subjected to the following: Clinical evaluation, history taking, laboratory measurement, and radiological studies.

Tests for Liver function by serum bilirubin, serum albumin, aspartate aminotransferase (AST), alanine transaminase (ALT), and international normalized ratio (INR).

Tests for renal function are done by blood urea serum creatinine.

Serum electrolytes (sodium, potassium) and erythrocyte sedimentation rate (ESR).

Iron studies: serum iron, ferritin, and total iron binding capacity (TIBC).

Tumor markers: (Alfa feto protein, carcinoembryonic antigen (CEA), CA19-9).

Virology markers (hepatitis B surface antigen (HBs Ag) and Hepatitis C antibody (HCV Ab).

Ultrasonography: To diagnose cirrhosis, hepatic focal lesion, portal vein diameter patency, spleen size, splenic vein diameter, and ascites.

The endoscopic assessment was done at the endoscopy unit of Alhussein and Sayed Galal hospitals. The patients were given conscious sedation.

Follow-up: Esophago-gastro-duodenoscopy (EGD) was scheduled every 2-4 weeks for about six months. Follow-up laboratory results (hemoglobin (Hb) level, serum iron, serum ferritin) were done monthly. Any complication related to the endoscopic procedure was reported on patient follow-up.

3. Results

No statistically significant variance in demographic features among the examined groups (Table 1).

Table 1. Demographic features of the examined groups

CHARACTERISTICS	APC (N= 35)	EBL (N= 37)	COMBINED (N= 36)	P VALUE
AGE (YRS.)	55.3±7.9	54.7±8.6	56.1±9.2	0.784
SEX (FEMALE/MALE)	19/16 (54% / 46%)	17/20(46% /54%)	18/18(50% /50%)	0.778
RESIDENCE (URBAN/RURAL)	14/21 (40% / 60%)	12/25(32%/ 68%)	10/26(28% /72%)	0.544

P-value >0.05: Non significant P-value <0.05: Significant P-value < 0.01: highly significant

No statistically significant difference among the studied groups concerning type of bleeding from severe PHG was observed (Table 2).

Table 2. Type of bleeding from PHG in the examined groups:

BLEEDING (YES)	APC (N= 35)	EBL (N= 37)	COMBINED (N= 36)	P VALUE
HEMATEMESIS ± MELENA	9 (26%)	12 (32%)	14 (39%)	0.100
MELENA ALONE	18 (51%)	23 (62%)	20 (56%)	
OCCULT BLEEDING	8 (23%)	2 (6%)	2 (5%)	

No statistically significant difference among the studied groups regarding evidence of portal hypertension was noted (Table 3).

Table 3. Evidence of portal hypertension in all patients:

CHARACTERISTICS	APC (N= 35)	EBL (N= 37)	COMBINED (N= 36)	P VALUE
SPLENOMEGALY	18 (51%)	21 (57%)	25 (69%)	0.28
PORTAL VEIN DILATATION	24 (69%)	27 (73%)	20 (61%)	0.27
COLLATERALS	6 (17%)	8 (22%)	11 (31%)	0.39
ESOPHAGEAL VARICES	12 (34%)	6 (16%)	9 (25%)	0.21

There was statistically significant difference among the studied groups regarding number of treatment sessions. In overt bleeding patients A statistically significant variance among the examined groups concerning number of treatment sessions while in occult bleeding patients: no statistically significant variance among the examined groups concerning number of treatment sessions was noted (Table 4).

There was statistically significant difference among the examined groups concerning the post-treatment hemoglobin level improvement with no statistically significant variance among the examined groups concerning the post-treatment Hospitalization, Transfusion and Incidence of endoscopic complications (Table 6).

Table 6. Post-treatment data of the examined groups

CHARACTERISTICS	APC (N= 35)	EBL GROUP (N= 37)	COMBINED THERAPY GROUP(N= 36)	P VALUE	
HB	7.2±1.6	8.1 ±1.6	9.4±.18	≤0.001	
HOSPITALIZATION	0.40±0.86	0.40±0.88	0.40±0.82	1	
BLOOD TRANSFUSION	20 (57%)	17 (49%)	12 (34%)	0.13	
INCIDENCE OF ENDOSCOPIC COMPLICATIONS	ulcer	2 (5.7%)	3 (8.1%)	4 (10.8%)	0.711
	Bloating	4(11.4%)	2(5.4%)	5(13.8%)	0.466
	Abdominal pain	5(14.2%)	4(10.8%)	5(13.8%)	0.889
	perforation	0	0	0	1
	Hypertrophied Polyp	0	2(5.4%)	2 (5.55%)	0.369

Table 4. Treatment sessions of the studied groups and number of rubber bands applied were studied

GROUPS	OVERT (N= 96) GROUP (I)		OCCULT (N= 12) GROUP (II)		P VALUE
	N	ttt sessions	N	Ttt sessions	
APC (A)	27	2 (1-4)	8	1 (1-3)	0.026
EBL (B)	35	3 (1-4)	2	1 (1-2)	
COMBINED (C)	34	1 (1-3)	2	2 (1-2)	
ONE WAY ANOVA	0.001*		0.382		
	P1 >0.05				
	P2 <0.05				
	P3 <0.05				

P1= group a Vs group b, P2= group a Vs group c, P3= group b Vs group c

In overt bleeding patients: A statistically significant variance among the examined groups concerning the Pre- and post-treatment hemoglobin level improvement while in occult bleeding patients: no statistically significant variance among the examined groups concerning the Pre- and post-treatment hemoglobin level improvement (Table 5).

Table 5. Pre- & post-treatment hemoglobin in overt and occult bleeding patients

HB (OVERT BLEEDING)				
	APC (n= 35)	EBL (n= 37)	Combined (n= 36)	P value
PRE	7.1±1.2	7.6±1.1	7.3±1.3	0.05
POST	7.2±1.6	8.1 ±1.6	9.4±.18	≤0.001
HB (OCCULT BLEEDING)				
PRE	7.1±1.2	7.6±1.1	7.3±1.3	0.210
POST	7.2±1.3	7.9 ±1.2	7.3±1.5	0.058

There was no statistically significant difference among the studied groups regarding the Child classification (Figure 1).

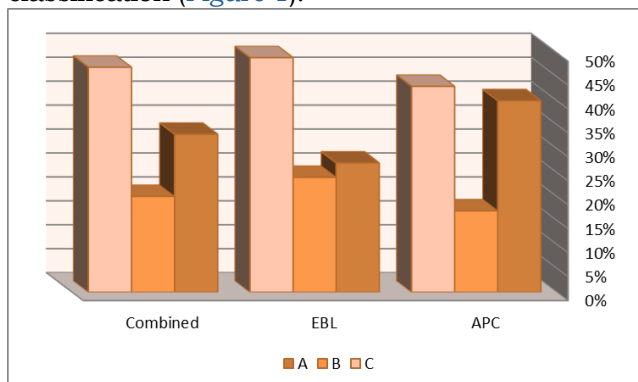


Figure 1. Child classification in the studied groups.

4. Discussion

The current research revealed no statistically significant variance in demographic features (age, sex, and residence) among the examined groups.

This is consistent with the findings of Abd El-Ghany et al.⁸ who discovered that cirrhosis was associated with advanced age in a univariate study. Furthermore, in a multivariate analysis, age was the sole significant predictor of cirrhosis. They stated that individuals who had clinical signs of portal hypertension were, on average, fifteen years older than those who just had histology indications of cirrhosis.

Regarding our results, there was no statistically significant variance among the studied groups concerning the kind of bleeding from severe PHG. This agrees with Yusoff et al.⁹

Our outcomes revealed no statistically significant variance between the examined groups concerning the Child classification.

Merkel et al.¹⁰ generated controversial findings by reporting the absence of a link between hepatic function, as evaluated by the Child-Pugh score and PHG.

Our research demonstrated that there was statistically significant variance among the examined groups concerning the number of treatment sessions, which means that in overt bleeding patients, combined therapies of APC and EBL need fewer treatment sessions than APC and EBL alone, but in occult bleeding cases, there was no statistically significant variance among the examined groups concerning the number of treatment sessions & this agrees with Roberto de Franchise.¹¹

Our study showed that combined therapies of APC & EBL are adequate procedures in the management of severe PHG, either with overt or occult bleeding, with more significance in overt bleeding patients than occult bleeding patients. This significance may be related to the fact that

the bleeding points in overt bleeding patients are targeted with the therapeutic procedures in contrast to occult bleeding patients that show diffuse distribution, which makes therapeutic procedures less effective.

Roberto de Franchise¹¹ (Baveno VII – Renewing consensus in portal hypertension) has demonstrated that APC is an effective method for managing PHG, either with overt or occult bleeding.

Also, Hanafy and El Hawary¹² concluded that after two years of managing PHG, we have discovered that the combination of APC and an appropriate dosage of nonselective beta-blockers is extremely effective in controlling bleeding from PHG. Additionally, we have found that APC alone is a quick and efficient method for controlling bleeding caused by PHG, particularly in cases where beta blockers cannot be used due to contraindications.

In occult bleeding patients: No statistically significant variance was observed among the examined groups concerning improving pre- and post-treatment hemoglobin levels. This may be related to the fact that PHG in occult bleeding patients shows diffuse distribution, which makes therapeutic procedures less effective.

The findings closely aligned with those of Gonzalez-Suarez et al.¹³ who examined the impact of APC on bleeding from PHG in a cohort of twenty-two cirrhotic individuals (sixteen with chronic anemia and six with PHG and acute bleeding). The individuals were monitored for an average duration of thirty-six months. The hemoglobin level showed a notable increase following the administration of APC.

Furthermore, these findings closely align with the research conducted by Hanafy et al.¹² which showed that using both APC and nonselective beta-blockers effectively and safely controlled bleeding from PHG. Furthermore, APC alone is fast and efficient in managing bleeding caused by PHG, particularly when beta blockers are not recommended.

Orloff et al.¹⁴ on the other hand, state that endoscopic therapy is not feasible for portal gastropathy due to its diffuse nature. The authors recommend pharmacological reduction of portal hypertension with propranolol, radiological intervention with TIPS, or surgical intervention with a portosystemic shunt.

Our research revealed that no significant endoscopic complications occurred during APC, EBL, or combined procedures among the studied patients.

This is in agreement with Herrera et al.¹⁵ who reported that we can effectively use APC to treat bleeding gastric lesions with minimal complications.

Also, Hashim et al.¹⁶ showed No adverse

postoperative consequences were observed in the analyzed patient groups, except for mild gaseous distension and localized discomfort at the epigastrium. However, it is essential to note that these effects are temporary and mild.

Our findings showed that there was statistically significant variance among the examined groups concerning after-treatment hemoglobin level improvement, especially in overt bleeding patients, with no statistically significant variance among examined groups concerning treatment Hospitalization, Transfusion and this agrees with Roberto de Franchise.¹¹

Limitation: The current study was limited by its small sample size, being a single-center study, the lack of a control group, and a relatively short follow-up period.

4. Conclusion

Portal hypertensive gastro-pathy is considered one of the most important reasons for microcytic hypochromic anemia in cirrhotic cases. APC, EBL, and combined therapies are all effective procedures in the management of severe PHG with no major endoscopic complications. In overt bleeding patients: Combined therapy of APC and EBL showed more superiority over APC and EBL alone. In occult bleeding patients: All procedures are effective, with no superiority of any procedure over the others.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

All authors have a substantial contribution to the article

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There are no conflicts of interest.

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