

Endoscopic Band Ligation Versus Argon Plasma Coagulation for the Treatment of Gastric Antral Vascular Ectasia in Egyptian Patients with Liver Cirrhosis

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Abstract: Argon Plasma Coagulation (APC) is the standard treatment of Gastric antral vascular ectasia (GAVE). Endoscopic band ligation (EBL) has become the standard treatment of varices because it effectively obliterates the submucosal plexus of esophageal varices with an acceptably low rate of complications. Recently, the use of banding in the gastric antrum with the same system that is used for variceal ligation has been evaluated for the treatment of GAVE. The aim of this study was to evaluate the therapeutic effects of EBL as a new modality for the treatment of bleeding from GAVE in comparison to APC in Egyptian patients with liver cirrhosis. The study was conducted on forty cirrhotic patients presenting with overt or occult bleeding from GAVE. The patients were divided into two groups: Group I (APC) group: 20 patients were subjected to APC. Group II (EBL) group: 20 patients were subjected to EBL. Sessions were applied every 3 weeks till adequate endoscopic ablation was achieved. Regular follow-up and endoscopic assessment at 6 months were done with documentation of the recurrence of GAVE if that occurred. Results revealed that Twenty one patients were females and 19 were males with age ranging from 40-70 years old. Most of the patients presented with overt bleeding (hematemesis and/or melena) (85% in the APC group and 80% in the EBL group). EBL was superior to APC as regards the rate of cessation of bleeding (95 versus 65%), lower rate of recurrence during follow-up (5 versus 40%) as well as higher increase in hemoglobin (P value 0.179), less transfusion requirements (P value <0.01), decreased rate of hospitalization (P value 0.045) and fewer treatment sessions (p value 0.001). In conclusions, Both APC and EBL are effective treatment options for GAVE. However, EBL proved to be superior to APC.

Key words: Liver Cirrhosis • Gastric Antral Vascular Ectasia • Argon Plasma Coagulation • Endoscopic Band Ligation

INTRODUCTION

Gastric Antral Vascular Ectasia (GAVE) is characterized by the presence of red spots without a background mosaic pattern that are typically located in the gastric antrum. GAVE is most frequently observed in patients with cirrhosis and portal hypertension. The etiology of this disorder remains unknown but recent theories include hypergastrinemia and elevated antral motility [1, 2].

The endoscopic treatment of GAVE with thermal therapies such as laser, electrocautery and argon plasma coagulation (APC) has been successful and provided an alternative to surgical antrectomy, but significant limitations including multiple treatment sessions, persistent bleeding and occasionally complications remain [3, 4].

Endoscopic band ligation (EBL) has become the standard treatment of varices because it effectively obliterates the submucosal plexus of esophageal varices

with an acceptably low rate of complications [5]. Additionally; EBL has been used and proved effective for other disorders of the gastrointestinal tract, including hemorrhoids, Dieulafoy lesions and as a component of endoscopic resection [6-8].

Recently, the use of banding in the gastric antrum with the same system that is used for variceal ligation has been evaluated for the treatment of GAVE [9]. In the present study we evaluated the therapeutic effects of EBL versus APC on GAVE in patients with liver cirrhosis.

MATERIALS AND METHODS

The present study was prospectively conducted on forty cirrhotic patients with overt or occult bleeding that proved endoscopically to be originating from GAVE. The recruited patients attended the Hepatology and Gastroenterology Department, Theodor Bilharz Research Institute (TBRI), from December 2010 till October 2012.

The patients were classified into two groups and were selected randomly by sealed envelopes. Group I (Argon plasma coagulation (APC) group) included 20 patients and were subjected to APC sessions. Group II (Endoscopic band ligation (EBL) group) included 20 patients and were subjected to EBL sessions. The study was performed according to the principles of the declaration of Helsinki. An informed consent was obtained from all patients.

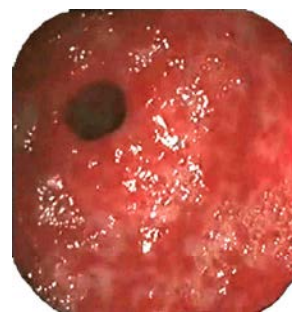
Patient demographics and pretreatment data were obtained from both the APC and EBL groups to check for the comparability between both groups. Pretreatment data included age, sex, previous endoscopy, previous blood transfusion, type of bleeding (overt or occult), pretreatment hemoglobin level, hospitalization, portal hypertension (portal vein congestion index), Child - Turcotte-Pugh score, presence or absence of hepatocellular carcinoma and endoscopic findings (Varices, GAVE and PHG).

In this study, standard APC equipment was used, consisting of a high-frequency electrosurgical generator (ICC 350;ERBE, Tübingen, Germany), an automatically regulated argon source (APC 300) and a flexible APC probe. The APC probe was a 2.3 mm Teflon-coated catheter with a heat-resistant ceramic tip, which could be passed through the working channel of an endoscope. Electrical power was 60 W and argon gas flow was 2 L/min. APC was applied to the lesion beginning at the pylorus and proceeding proximally.

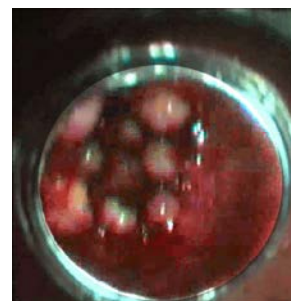
EBL was carried out using a pneumo-activate device (Sumitomo Bakelite, Tokyo, Japan) and ligation bands were placed on the GAVE. Ligation bands were applied to abnormal-appearing mucosa in the antrum. The most distal antrum, adjacent to the pylorus, was treated first. Subsequent ligation bands were applied more proximally until as much as possible of the abnormal-appearing mucosa was treated. Up to 18 ligation bands had been applied during 1 procedure, clean based ulcers had been developed. By 3 weeks, the mucosa had healed, leaving a small amount of residual abnormal mucosa.

All patients were on a proton pump inhibitor for 1 week. Patients were instructed to adhere to a liquid diet for the remainder of the day of the procedure and then to advance to their prior diets as tolerated. Patients in both groups were reevaluated every 3 weeks until satisfactory improvement of GAVE was achieved. Patients were also re-evaluated in the event of recurrence of overt bleeding (hematemesis and/or melena) in between the sessions or in case of severe anemia necessitating blood transfusion. The number of treatment sessions was recorded and all patients underwent follow-up endoscopy at 6 months to assess the recurrence of GAVE.

The Pictures from 1 to 7 were taken during endoscopic treatment for GAVE in the two groups : (pictures from 1-4 in the EBL group) and (pictures from 5-7 in the APC group)



Pic. 1: GAVE before treatment



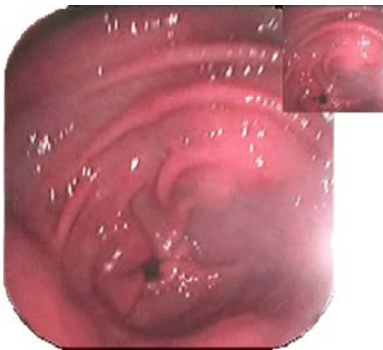
Pic. 2: E.B.L for GAVE



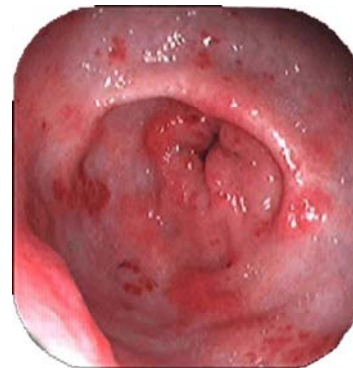
Pic. 3: Clean based ulcers formed After E.B.L)



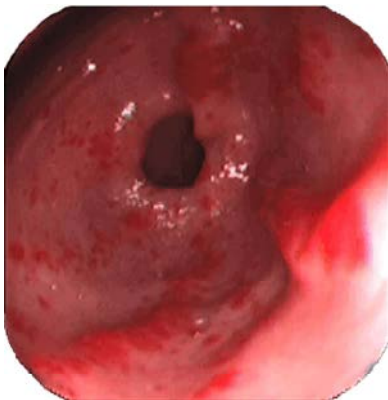
Pic. 6: APC for GAVE



Pic. 4: The patient cured (follow up endoscopy After E.B.L)



Pic. 7: Recurrence of GAVE (at follow up endoscopy)



Pic. 5: GAVE before treatment.

Post-treatment data on cessation of bleeding, rise of hemoglobin, transfusion requirements, number of treatment sessions and recurrence of GAVE was obtained and compared between both groups.

Results were expressed as means \pm standard deviation of the means or number (%). Comparison between the two groups was performed using ANOVA with post hoc least significance difference test. Comparison between categorical data was performed

using Chi square test. Spearman rank correlation coefficient was used to determine significant correlations among different parameters. The data were considered significant if p values was < 0.05 and highly significant if $p < 0.01$. Statistical analysis was performed with the aid of the SPSS computer program (version 12 windows).

RESULTS

The study was conducted on 40 cirrhotic patients (21 of them were females and 19 were males with age ranging from 40-70 years old).

Demographic and pretreatment clinicopathological features of the studied patients are shown in Table 1.

Treatment outcomes in the two studied groups are shown in Table 2

DISCUSSION

Although GAVE is considered a rare medical condition, it accounts for up to 4% of all non-variceal upper gastrointestinal bleedings[10]. The study aimed to evaluate the therapeutic effects of EBL versus APC on GAVE in patients with liver cirrhosis.

Table 1:

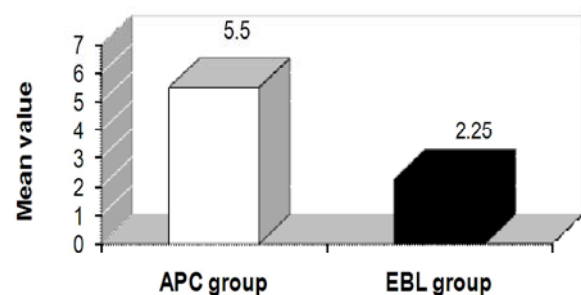
Characteristics	APC (n=20)n (%)	EBL(n=20)n (%)	P value
Mean age (years)	57.17	55.65	NS
Gender (female/male)	10/10(50%/50%)	11/9 (55%/45%)	NS
Residence (rural/urban)	9/11 (45%/55%)	9/11 (45%/55%)	NS
Previous hematemesis & or melena	11 (55%)	16 (80%)	NS
Previous EIS or EVL	6 (30%)	6 (30%)	NS
Mean Hb (gm/dl)	7.49±1.61	7.24±2.42	NS
Underlying pathology of CLD:			
Liver cirrhosis	16 (80%)	18 (90%)	NS
Liver cirrhosis + HCC	4 (20%)	2(10%)	NS
Etiology of liver cirrhosis			
HCV	17(85%)	19(95%)	NS
HBV	3(15%)	1(5%)	NS
Child's score			
B	3 (15%)	4 (20%)	NS
C	17 (85%)	16 (80%)	NS
Congestion index of portal vein	0.11±0.03	0.12±0.03	NS
Collaterals	8 (40%)	6 (30%)	NS
Type of bleeding from GAVE			
Occult bleeding	9 (45%)	4 (20%)	NS
hematemesis±melena	2 (10%)	3 (15%)	NS
Melena	9 (45%)	13 (65%)	NS
Endoscopic type of GAVE:			
Punctuate type	15 (75%)	17 (85%)	NS
Classic type	5 (25%)	3 (15%)	NS
Mean number of hospitalizations	1.05 ± 0.69	1.90 ± 1.83	NS
Mean number of transfusions	4.10 ± 3.01	5.55 ± 2.04	NS

NS= not significant EIS: endoscopic injection sclerotherapy EVL: endoscopic variceal ligation

Table 2:

Characteristics	APC group (n= 20)	EBL group (n= 20)	P value
Cessation of bleeding	13(65%)	19 (95%)	0.018*
Recurrence of bleeding	7 (35%)	1 (5%)	0.018*
Endoscopic recurrence of GAVE	8 (40%)	1 (5%)	0.008**
Mean Hb(gm/dl)	8.92±2.12	9.68±1.31	0.179 ^{NS}
Mean number of hospitalizations	0.50±0.95	0.05±0.22	0.045*
Mean number of transfusions	2.00±2.97	0.15±0.67	<0.01**
Mean change in Hb(gm/dl)	1.43 ± 0.94	2.45 ± 1.41	0.052 ^{NS}
Mean change in hospitalizations	-0.55 ± 1.05	-1.85 ± 1.87	0.046*
Mean change in transfusions	-2.10 ± 1.65	-5.40 ± 2.04	<0.01**

NS= not significant; *p< 0.05= significant, **p< 0.01= highly significant.



No complications were reported. The EBL group had a statistically significant fewer treatment sessions.

Fig. 1: Treatment sessions in the APC and EBL groups

In the current study the mean age of cirrhotic patients presented with GAVE was 55 years and it nearly equally presented in both males and females. Selinger and Ang [11] found that the mean age of patients presenting with bleeding GAVE is 65 years and it was more common in males (75% of the patients were males) which is not consistent with our results. This may be due to the younger age of development of cirrhosis in Egyptian patients. Acute blood loss (hematemesis and/or melena) was detected in 11 patients(55%) in the APC group compared to 16 patients(80%) in the EBL group and this is in agreement with Lecleire and colleagues [12] stated that in cirrhotic patients with GAVE acute hemorrhage appears to be more frequent. In our study previous endoscopic intervention (sclerotherapy and /or band ligation) for esophageal varices may be a risk factor for the development of GAVE since 30% in each group (APC and EBL groups) gave history of previous intervention for esophageal varices which is in accordance with previous reports[13]. The optimal treatment method for GAVE is not known. Before 1990, surgical antrectomy was the treatment of choice [14]. However, surgery carries a significant risk of mortality in cirrhotic patients.

Recently, endoscopic techniques have become the first treatment of choice for GAVE. The data available in the literature comparing therapeutic efficacy of APC and EBL is scarce. In the present study, treatment of GAVE by EBL had required significantly fewer treatment sessions with the mean number of 2.25 ± 0.64 compared to APC with the mean number of 5.5 ± 3.76 and this are in agreement with a study done by Wells and colleagues [9] who concluded that treatment of GAVE by EBL had required significantly fewer treatment sessions compared to APC. This finding is not in accordance with the findings obtained by Sato and colleagues [15] who concluded that treatment of GAVE by APC had required fewer treatment sessions compared to EBL. This may be due to the fact that Sato and colleagues recruited patients with liver diseases only with a significant proportion of them having severe diffuse type of GAVE.

Finally EBL compared to APC had significantly higher rate for cessation of bleeding, fewer treatment sessions required for cessation of bleeding, greater increase in hemoglobin levels (however not reaching a statistical significance), a greater decrease in transfusion requirements, greater decrease in hospital admissions and low rate of endoscopic recurrence during the follow-up period (6 months).

On the basis of our study, EBL is safe and effective and may be superior to ETT in treating cirrhotic patients with bleeding GAVE. Prospective studies should be performed to further evaluate this promising treatment modality.

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