Journal of Medicine in Scientific Research

Volume 1 | Issue 1 Article 1

Subject Area:

The efficacy of argon plasma coagulation in the treatment of gastric antral vascular ectasia in Mataria teaching hospital

Aisha El-Shimy
NIUN

El Saied E. Shabaan
Mataria Teaching Hospital, doctorsaid55@gmail.com

Tarek A. Fouad
Mataria Teaching Hospital

Recommended Citation

El-Shimy, Aisha; Shabaan, El Saied E.; and Fouad, Tarek A. (2018) "The efficacy of argon plasma coagulation in the treatment of gastric antral vascular ectasia in Mataria teaching hospital," *Journal of Medicine in Scientific Research*: Vol. 1: Iss. 1, Article 1.
DOI: https://doi.org/10.4103/JMISR.JMISR_3_18

Original Article

The efficacy of argon plasma coagulation in the treatment of gastric antral vascular ectasia in Mataria teaching hospital

El Saied E. Shabaan[a], Tarek A. Fouad[a], Aisha El-Shimy[b]
[a]GIT Unit, Mataria Teaching Hospital, [b]Department of Clinical Pathology, NIUN, Cairo, Egypt

Abstract

Background
Gastric antral vascular ectasia (GAVE) is characterized by mucosal and submucosal vascular ectasia. It may present with iron-deficiency anemia or gastrointestinal bleeding. Argon plasma coagulation (APC) may be used for treating GAVE. This study aims to evaluate the efficacy and safety of APC in the treatment of GAVE.

Patients and methods
A total of 30 patients with GAVE and in need of treatment for bleeding or anemia were treated with APC every 2 to 4 weeks until eradication of GAVE or cessation of the patient's initial symptoms. They were then followed up on a monthly basis for recurrence of initial symptoms or blood transfusion and measurement of hemoglobin levels. Follow-up endoscopy was done after 6 months.

Results
Among the thirty patients who were included in the study, GAVE was associated with underlying cirrhosis in 18 (60%) patients. Indications for treatment were hematemesis and/or melena in 16 (53.3%) patients and iron-deficiency anemia in 14 (46.6%) patients. A total of 78 APC sessions were conducted for the treatment of GAVE (2.6 sessions per patient, range: 1–6 sessions). Successful endoscopic eradication of GAVE was achieved in 11 of 30 patients (36.6%). Seventeen (56.6%) patients showed improvement in the severity of GAVE from endoscopic evaluation with cessation of the patient's initial symptoms, highly significant reduction of blood transfusion, and an improvement in hemoglobin levels (highly significant). Only two (6.6%) patients showed no improvement in the severity of GAVE from endoscopic evaluation with the continuation of the patient's initial symptoms (bleeding). No endoscopy-related adverse events were found during the study period.

Conclusion
Endoscopic APC is safe and effective in treating GAVE with a significant reduction in the need for blood transfusion and an improvement in hemoglobin levels, but endoscopic eradication rate of GAVE is low (36.6%).

Keywords: Anemia, argon plasma coagulation, cirrhosis, gastric antral vascular ectasia, gastric fundal vascular ectasia

Introduction

Gastric antral vascular ectasia (GAVE) is characterized by mucosal and submucosal vascular ectasia [1]. The majority of patients present with iron-deficiency anemia, secondary to occult blood loss. Patients also present with positive fecal occult blood on a routine check-up. Some patients also present with overt gastrointestinal bleeding, in the form of intermittent melena and, occasionally, hematemesis [1]. Indeed, 60–70% of patients are transfusion dependent due to recurrent anemia, despite iron supplementation.

Access this article online
Quick Response Code:
Website: www.jmsr.eg.net
DOI: 10.4103/JMISR.JMISR_3_18

Histologically, dilated mucosal capillaries with fibrin thrombi and fibromuscular hyperplasia of the lamina propria are seen, without inflammation [2].

There are two types of GAVE based on distinctive endoscopic appearances. The classic type consists of this 'watermelon'

Correspondence to: El Saied E. Shabaan, MD,
GIT Unit, Mataria Teaching Hospital, Mataria Square, Cairo, Egypt.
Tel: 01002686849, Fax: 02 22506090.
E-mail: doctorsaid55@gmail.com

How to cite this article: Shabaan EE, Fouad TA, El-Shimy A. The efficacy of argon plasma coagulation in the treatment of gastric antral vascular ectasia in Mataria teaching hospital. J Med Sci Res 2018;1:3-7.

appearance of multiple flat, linear, erythematous strips of ectatic vessels radiating from the pylorus to the antrum. The second type is punctate, where the ectasia manifests as diffuse antral angiomas and tends to be more associated with liver cirrhosis [3].

Most cases of GAVE are associated with liver cirrhosis, autoimmune disease, chronic renal failure, heart disease, diabetes, hypothyroidism, and bone marrow transplantation. The actual etiology of GAVE is unknown [4].

Argon plasma coagulation (APC) is an electrosurgical technique for the management of bleeding and the devitalization of tissue abnormalities. This is achieved by a noncontact thermal coagulation in which high frequency current is applied to the target tissue through an argon plasma jet creating effective hemostasis and a homogenous surface coagulation with a limited penetration depth. Many studies have demonstrated the efficacy of APC for treating GAVE. Its main advantage is that coagulation is more superficial, thus reducing the risk of complications [4-5].

Aim

This study aims to evaluate the efficacy and safety of APC in the treatment of GAVE.

Patients and methods

This study was carried out at the GIT endoscopy unit and the Internal Medicine Department, at Mataria Teaching Hospital from February 2016 to October 2017.

A total of 30 patients with GAVE diagnosed by endoscopy and who needed treatment for bleeding or anemia were included in the study.

All the patients underwent full history taking, together with a general and local examination by an internal medicine consultant.

Patients were excluded from the study if there was no indication for treatment of GAVE (no bleeding or anemia), or if they were noncooperative or refused the procedure, or if they did not continue the follow-up period.

All patients were thoroughly examined for vital signs, signs of portal hypertension such as dilated abdominal veins, or splenomegaly; signs of liver cell failure such as jaundice, ascites, lower limb edema, fetor hepaticus, flapping tremors, or spider nevi; and signs of renal, cardiac, or respiratory disease.

Biochemical measurements

The following tests were performed: liver function tests, international normalized ratio; kidney function tests including blood urea and serum creatinine, and complete blood count. For the hepatic patient, the Child–Pugh score and grade were calculated.

Upper gastrointestinal endoscopy

After an 8 h fast, all patients underwent gastroduodenoscopy using a video endoscopic system (Pentax EG 3490K or Pentax EG 3890LK, Japan).

During endoscopy, the following were evaluated: degree and site of GAVE, presence of esophageal varices and their grade, fundal extension or presence of fundal varix, gastritis or duodenitis, erosions, and ulcerations.

Argon plasma coagulation

The APC equipment consisted of an APC probe (lumen 1.5 mm, outer diameter 2.0 mm) advanced from the end of the working therapeutic accessory channel of the endoscope, a gas source, and a high-frequency generator. The argon gas flow was regulated at 2.5 l/min. The electrical power output was adjusted to 60 W.

APC was applied to all areas with visible mucosal vascular lesions for about 1–3 s, with ~5 mm distance between APC probe and the gastric mucosal lesion. The endpoint of successful endoscopic therapy is the production of a white coagulum which limits the depth of coagulation. APC is applied dynamically to the antral lesions beginning near the pylorus and proceeding proximally towards the antral lesions. The same settings are applied to lesions in the cardiac fundus starting from just below the Z-line in the retroflex position.

All patients received proton pump inhibitor therapy after the procedure to enhance mucosal healing.

The procedure was repeated every 2–4 weeks until complete endoscopic obliteration was accomplished or definitive criteria for successful treatment were detected: an improvement in the severity of GAVE from endoscopic evaluation, cessation of the patient's initial symptoms, cessation of blood transfusion, and an improvement in hemoglobin levels.

Follow-up of the patients

All patients had a monthly follow-up of their clinical and laboratory parameters for 6 months after the last endoscopic APC treatment.

Post-treatment follow-up includes recording cessation of bleeding, transfusion requirements, and hemoglobin measurement. Patients were then followed up endoscopically after 6 months.

Endoscopic eradication of GAVE was defined as no endoscopic evidence of GAVE after at least one treatment session with APC. Recurrence of GAVE was defined as endoscopic reappearance of GAVE on a subsequent esophagogastroduodenoscopy after successful eradication.

This study was approved by Research ethical committee of GOTHI, and informed consent from every patient was obtained.

Statistical analysis

Statistical analysis was performed using SPSS (SPSS Inc., Chicago, Illinois, USA). Data were expressed as mean ± SD for numerical variables.

The probability value *P* value greater than or equal to 0.05 indicates not significant, *P* value less than or equal to 0.05 is considered to be statistically significant, and *P* value of less

than or equal to 0.01 is considered to be statistically highly significant.

Results

A total of 30 patients were included in the study. Median age (range) at the time of the first esophagogastroduodenoscopy was 57 years (37–70 years). Fourteen (46.6%) patients were male and 16 (53.4%) patients were female. GAVE was associated with underlying cirrhosis in 18 (60%) patients (Table 1).

Indications for treatment were hematemesis and/or melena in 16 (53.3%) patients and iron-deficiency anemia in 14 (46.6%) patients (Table 1).

A total of 78 APC sessions were held for the treatment of GAVE (2.6 sessions per patient, range: 1–6 sessions) (Table 1).

Successful endoscopic eradication of GAVE was achieved in 11 of 30 patients (36.6%). Seventeen (56.6%) patients showed improvement in the severity of GAVE from endoscopic evaluation with cessation of the patient's initial symptoms, highly significant reduction of blood transfusion, and an improvement in hemoglobin levels (highly significant). Only two (6.6%) patients showed no improvement in the severity of GAVE from endoscopic evaluation with the continuation of the patient's initial symptoms (bleeding) (Table 1).

There was no correlation between number of treatment sessions and GAVE treatment success (Table 4).

During the follow-up period, no case of recurrence of GAVE was noted in the 11 patients who had an endoscopic resolution of GAVE.

Comparison between hemoglobin level before and after treatment (after last APC session), showed highly statistically significant increase in the hemoglobin levels after treatment (Table 1).

The patients required a significantly lower number of blood units transfused after treatment than before treatment, with a mean of 0.7 versus 2.1 units, respectively ($P < 0.001$) (Table 1).

No endoscopy-related adverse events were found during the study period (Table 1).

There was no significant difference between cirrhotic and noncirrhotic patients as regards age, sex, indication for treatment of GAVE, hemoglobin before or after treatment, blood transfusion before and after treatment, number of APC sessions needed, or response to APC treatment (Table 2).

Also, there was no significant difference between patients presented with bleeding and patients presented with anemia as regards age, sex, associated cirrhosis, hemoglobin before or after treatment, blood transfusion before and after treatment, number of APC sessions needed, or response to APC treatment (Table 3).

Table 1: Demographic features of the studied patients

	Patients with GAVE who need APC treatment	*P*
Age [mean±SD (range)]	55±7.8 (37-70)	
Male/female	14/16	
Cirrhotic/noncirrhotic [*n* (%)]	18 (60)/12 (40)	
Child-Pugh classification		
A	10	
B	6	
C	2	
Child-Pugh score	6.5±1.8	
Previous band ligation	11	
Indication for treatment		
Upper GIT bleeding	16	
Iron-deficiency anemia	14	
Hemoglobin before treatment	7.3±1.6	*P*>0.001
Hemoglobin after treatment	9.4±1.2	
Blood transfusion units (before treatment)	7.3±1.6	*P*>0.001
Blood transfusion units (after treatment)	9.4±1.2	
APC sessions	2.6±0.96	Total sessions 78
Number of sessions	1 2 3 4 5 6	
Number of patients	1 16 9 3 0 1	
Complication	No	
Response to treatment		
Endoscopic eradication of GAVE	11	
Endoscopic improvement	17	
No endoscopic improvement	2	

APC, argon plasma coagulation; GAVE, gastric antral vascular ectasia; GIT, gastrointestinal.

Table 2: Comparison between cirrhotic and noncirrhotic patients

	Cirrhotic patients	Noncirrhotic patients	*P*
Number	18	12	NS
Age [mean±SD (range)]	56.2±6.2 (46-70)	53±9.5 (37-67)	NS
Male/female	10/8	4/8	NS
Indication for treatment			
Upper GIT bleeding	11	5	NS
Iron-deficiency anemia	7	7	
Hemoglobin before treatment	7.3±0.9	7.1±1.7	NS
Blood transfusion units (after treatment)	1±1.67	0.35±0.74	NS
Number of APC sessions	2.75±1.23	2.4±0.51	NS
Response to treatment			
Endoscopic eradication of GAVE	5	6	NS
Endoscopic improvement	9	8	
No endoscopic improvement	2	0	
Hemoglobin after treatment	9.5±1.09	9.1±1.3	NS
Blood transfusion units (before treatment)	2.1±1.2	2.25±1.4	NS

APC, argon plasma coagulation; GAVE, gastric antral vascular ectasia; GIT, gastrointestinal.

There was no significant correlation between the response to APC treatment and age, sex, associated cirrhosis, Child–Pugh score of cirrhotic patients, an indication of treatment, hemoglobin before or after treatment, or blood transfusion before or after treatment (Table 4).

Discussion

In our study, 28 of 30 patients (93.3%) showed either eradication or improvement in the severity of GAVE endoscopically with improvement in the patient's initial symptoms, highly significant reduction in the need for transfusion, and improvement in hemoglobin levels.

Many previous studies had reported that APC had greater than 80% success rate for treatment of anemia or GI bleeding related to GAVE [3,6–11].

Also, in Egypt, Naga *et al*. [12], studied 29 patients with endoscopically proved GAVE and found that after APC, the hemoglobin level had significantly increased and the transfusion requirements had significantly decreased.

Table 3: Comparison between bleeding and anemic patients

	Bleeding group	Anemic group	*P*
Number	16	14	N.S
Age	55.3±8.8 (37-70)	54.6±6.9 (45-67)	N.S.
Male/female	7/9	7/7	N.S
Cirrhotic/non-cirrhotic	11/5	7/7	N.S
Child-Pugh score	7.3±0.9	5.2±0.4	N.S.
Hemoglobin before treatment	7.6±1.5	6.9±0.94	N.S
Hemoglobin after treatment	9.5±1.08	9.26±1.2	N.S.
Blood transfusion units (before treatment)	2.6±1.08	1.64±1.39	N.S.
Blood transfusion units (after treatment)	1±1.67	0.35±0.74	N.S.
Number of APC sessions	2.75±1.23	2.4±0.51	N.S
Response of treatment			
Endoscopic eradication of GAVE	5	6	N.S
Endoscopic improvement	9	8	
No endoscopic improvement	2	0	

In one of the more important trials involving 50 cirrhotic patients with iron-deficiency anemia or melena related to GAVE, after the last APC session an increased mean hemoglobin of 1.35 ± 0.24 g/dl was recorded in ~8.5 months of follow-up [13].

This study showed a low success rate of APC in the eradication of GAVE as the eradication of GAVE was recorded in only 11 of 30 patients (36.6%).

The same findings were also observed by Garg *et al.* [14], who found that APC had a low success rate (40%) for endoscopic resolution of GAVE.

There was no complication related to APC during endoscopy or after treatment in the 78 treatment sessions of 30 patients in the present study.

Our study and many previous studies [1,13,15] confirm the safety of APC in the treatment of GAVE.

Although APC is thought to be the gold standard for treatment of GAVE, it may not be useful in some cases. In this study, two (6.6%) patients showed no improvement in the severity of GAVE with continuation of the patient's initial symptoms (bleeding) and need for blood transfusion.

There were also 17 (56.6%) patients with clinical improvement and reduction in the need for transfusion and an improvement in hemoglobin levels. APC, however, failed to eradicate GAVE although its severity decreased endoscopically.

Another alternate therapy for GAVE such as endoscopic band ligation and radiofrequency ablation should be tried when APC fails, and more investigations for the efficacy and safety of these therapies should be carried out [15].

In conclusion, endoscopic APC is a safe and effective approach in the treatment of GAVE with a significant reduction in the need for blood transfusion and an improvement in hemoglobin levels, but endoscopic eradication rate of GAVE is low (36.6%).

Financial support and sponsorship

Nil.

Table 4: Comparison based on endoscopic response to APC treatment

	Eradicated group	Improved group	Non responder	*P*
Number	11	17	2	
Age	55.2±7.9 (37-70)	55.1±7.5 (41-70)	57±1.4 (56-58)	N.S
Male/female	9/2	5/12	0/2	N.S
Cirrhotic/non-cirrhotic	6/5	11/7	1/1	N.S
Child-Pugh score	6.6±1.8	6.5±1.9	7	N.S.
Hemoglobin before treatment	7.2±1.3	6.9±0.93	6.25±0.91	N.S
Hemoglobin after treatment	9.3±1.2	9.26±1.2	7.7±0.7	N.S.
Blood transfusion units (before treatment)	2.1±1.3	2.4±0.94	3.5±0.7	N.S
Blood transfusion units (after treatment)	0.68±1.36	058±1	4.5±0.7 (P>0.05)	
Number of APC sessions	2.6±0.97	2.5±0.79	5±1.4	N.S

Conflicts of interest

There are no conflicts of interest.

References

1 Elhendawy M, Mosaad S, Alkhalawany W, Lobna Abo-Ali L, Enaba M, Elsaka A, Elfert AA. Randomized controlled study of endoscopic band ligation and argon plasma coagulation in the treatment of gastric antral and fundal vascular ectasia. United European Gastroenterol J 2016; 4:423–428.

2 Payen JL, Calès P, Voigt JJ, Barbe S, Pilette C, Dubuisson L, *et al*. Severe portal hypertensive gastropathy and antral vascular ectasia are distinct entities in patients with cirrhosis. Gastroenterology 1995; 108:138–144.

3 Chiu YC, Lu LS, Wu KL, Tam W, Hu ML, Tai WC, *et al*. Comparison of argon plasma coagulation in themanagement of upper gastrointestinal angiodysplasia and gastric antral vascular ectasia hemorrhage. BMC Gastroenterol 2012; 12:67.

4 Naidu H, Huang Q, Mashimo H. Gastric antral vascular ectasia: the evolution of therapeutic modalities. Endosc Int Open 2014; 2:E67–E73.

5 Kwan V, Bourke MJ, Williams SJ, Gillespie PE, Murray MA, Kaffes AJ, *et al*. Argon plasma coagulation in the management of symptomatic gastrointestinal vascular lesions: experience in 100 consecutive patients with long-term follow-up. Am J Gastroenterol 2006; 101:58–63.

6 Sebastian S, McLoughlin R, Qasim A, O'Morain CA, Buckley MJ. Endoscopic argon plasma coagulation for the treatment of gastric antral vascular ectasia (watermelon stomach): long-term results. Dig Liver Dis 2004; 36:212–217.

7 Yusoff I, Brennan F, Ormonde D, Laurence B. Argon plasma coagulation for treatment of watermelon stomach. Endoscopy 2002; 34:407–410.

8 Roman S, Saurin JC, Dumortier J, Perreira A, Bernard G, Ponchon T. Tolerance and efficacy of argon plasma coagulation for controlling bleeding in patients with typical and atypical manifestations of watermelon stomach. Endoscopy 2003; 35:1024–1028.

9 Lecleire S, Ben-Soussan E, Antonietti M, Goria O, Riachi G, Lerebours E, Ducrotté P. Bleeding gastric vascular ectasia treated with argon plasma coagulation: a comparison between patients with and without cirrhosis. Gastrointest Endosc 2008; 67:219–225.

10 Herrera S, Bordas JM, Llach J, Ginès A, Pellisé M, Fernández-Esparrach G, *et al*. The beneficial effects of argon plasma coagulation in the management of different types of gastric vascular ectasia lesions in patients admitted for GI hemorrhage. Gastrointest Endosc 2008; 68:440–446.

11 Boltin D, Gingold-Belfer R, Lichtenstein L, Levi Z, Niv Y. Long-term treatment outcome of patients with gastric vascular ectasia treated with argon plasma coagulation. Eur J Gastroenterol Hepatol 2014; 26:588–593.

12 Naga M, Esmat S, Naguib M, Sedrak H. Long-term effect of argon plasma coagulation (APC) in the treatment of gastric antral vascular ectasia (GAVE). Arab J Gastroenterol 2011; 12:40–43.

13 Bhatti MA, Khan AA, Alam A, Butt AK, Shafgat F, Malik K, *et al*. Efficacy of argon plasma coagulation in gastric vascular ectasia in patients with liver cirrhosis. J Coll Physicians Surg Pak 2009; 19:219–222.

14 Garg S, Aslam B, Nickl N. Endoscopic resolution and recurrence of gastric antral vascular ectasia after serialt reatment with argon plasma coagulation. World J Gastrointest Endosc 2017; 9:263–266.

15 Dias de Castro F, Boal Carvalho P, Cúrdia Gonçalves T, Magalhães J, Moreira MJ, Marinho C, Cotter J. Treating gastric antral vascular ectasia – when argon therapy is not enough.GE Port J Gastroenterol 2016; 23:249–253.