

COMPARISON OF ARGON PLASMA COAGULATION AND INJECTION THERAPY WITH ADRENALIN AND POLIDOCANOL IN THE MANAGEMENT OF BLEEDING ANGIODYSPLASIA IN UPPER GASTROINTESTINAL TRACT

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ABSTRACT

Introduction: The term angiodysplasia (AD) refers to acquired malformation of the blood vessels (communications between veins and capillaries), frequently found within the gastrointestinal mucosa and submucosa. AD of stomach and duodenum are cause of upper gastrointestinal bleeding in 4%-7% of patients. The means of treatment are usually endoscopic, including argon plasma coagulation (APC), electrocoagulation, mechanical hemostasis by clipping, laser photo-coagulation and injection therapy.

Aim: To compare the success rate, and adverse events (ulcer lesions, perforations) of APC and injection therapy in the treatment of bleeding angiodysplasia in the upper gastrointestinal tract (GIT).

Material and Methods: In a prospective study including 50 patients with bleeding angiodysplasia of the upper GIT, 35 patients were treated with APC, and remaining 15 with injection therapy using adrenaline and 1.5% solution of polidocanol. Follow-up period was 6 months.

Results: A total of 50 patients aged 18 to 64 years, 64% male and 36% female, have been treated during 2 years period. The rate of recurrent bleeding and side effects was significantly higher in the adrenaline group ($p < 0.01$). Blood transfusion was required in 68% during the first hospital admission. Angiodysplasia of the stomach was present in 66%, versus 34% in duodenum.

Conclusion: Endoscopy is “gold standard” for diagnosis and treatment of AD in the gastrointestinal tract. The study unveiled APC as more effective treatment option with lower degree of complications and adverse events in comparison to injection therapy in patients with bleeding AD.

Keywords: Angiodysplasia, upper gastrointestinal bleeding, endoscopy, Argon Plasma Coagulation, polidocanol injection

INTRODUCTION

Angiodysplasia (AD) are vascular malformations most frequently occurring in the GI tract, regarding to the other parts of the body. AD is acquired aberrant blood vessel found within the gastrointestinal mucosa and submucosa.

Pathologically described as “abnormal, dilated communications between veins and capillaries, lined with endothelium, with absent or very thin muscle layer and not bigger than 10 mm”, macroscopically alike telangiectasias, yet distinct

from them (1, 2). AD is also present in some systemic and congenital diseases. Taxonomy is mainly based on the endoscopic appearance [1]. AD according the localization is more often found in the right colon and dominantly in elderly patients. The significance of AD depends on the clinical presentation, which varies from completely asymptomatic, through unexplained forms of sideropenic anemia due to occult GI bleeding, to overt bleeding sometimes leading to life-threatening GI haemorrhage [2].

The prevalence of angiodysplasia is difficult to estimate. According to some authors, it is about 0.8%, although, with the use of sufficiently sensitive diagnostic methods, the prevalence is probably higher than the one diagnosed in clinical practice [3, 4]. It is thought that 40-60% of patients have more than one angiodysplasia [5]. Endoscopic classification of gastrointestinal angiodysplasia is based on three main factors: location, size, and number of lesions [6]. (Table 1).

Table 1. Endoscopic classification of gastrointestinal angiodysplasia

Localization of the lesion
Gastric (stomach)
Duodenal
Small intestinal
Colonic
Size of the lesion
Small (diameter <2 mm)
Intermediate (diameter from 2 to 5 mm)
Large (diameter > 5 mm)
Number of lesions
Solitary (n = 1)
Multiple (n = 2 to 10)
Diffuse (n > 10)

Angiodysplasia of the stomach and duodenum may cause upper gastrointestinal bleeding and blood loss in 4-7% of the patients [7]. Hemorrhage from the upper GI tract including occult blood loss is present in 49% of patients who have AD, and the remaining 51% are asymptomatic incidental finding [8].

All patients with AD with signs of occult bleeding or clinically apparent sideropenic anemia, are advised for treatment during the endoscopic examination, even when signs of active

bleeding are absent. If necessary, patients should additionally be recommended for iron substitution treatment [9]. Patients with bleeding angiodysplasia are treated by different therapeutic modalities as interventional endoscopy, interventional angiography, surgical treatment, and medicaments. Endoscopic treatment includes several procedures as: argon plasma coagulation (APC), electrocoagulation techniques, mechanical hemostasis by clipping, laser photocoagulation and injection therapy with sclerosing agents (sclerotherapy). In addition, an embolization angiography may also be used [10, 11].

Argon plasma coagulation (APC) is an endoscopic procedure used primarily for the control of bleeding from certain lesions in the gastrointestinal tract. It is applied during oesophagogastroduodenoscopy or colonoscopy. APC involves the use of high frequency current of ionized argon gas transmitted to target tissue or lesion without direct contact, with probe set at a certain distance from the bleeding lesion [12]. The high-frequency electric current carried out through the gas stream (argon plasma current) is resulting in coagulation of the bleeding lesion at the other end of the jet. Since no physical contact with the lesion occurs, the procedure is safe and can be used to treat bleeding in parts of the gastrointestinal tract with thin walls, such as the caecum [13]. The depth of coagulation is usually only a few millimeters (limited to around 3 mm). APC is used to treat the following conditions: angiodysplasia anywhere in the GI tract, gastric antral vascular ectasia, colon polyps, polypectomy, radiation proctitis, and esophagus cancer [14]. Numerous studies provide support for the effectiveness and reliability of APC in clinical practice compared to other techniques [2]. AD is also endoscopically treated by injection therapy using adrenaline and 1.5% solution of polidocanol.

AD can be treated conservatively with medication as: hormone with estrogens (+progesterone), angiogenesis inhibitors (thalidomide) and somatostatin analogues (octreotide), in only minimal limited bleeding in a haemodynamically stable patients. Surgical resection is considered only in patients with acute life-threatening haemorrhage, and a well-defined bleeding site with continuation of severe bleeding despite endoscopic management [15, 16].

AIM

Correlation and assessing the efficacy of APC therapy and injection therapy with adrenaline and polidocanol solution in the treatment of bleeding angiodysplasia in the upper GIT. Comparison of adverse effects (ulcer lesions, perforation) in patients with bleeding angiodysplasia in the upper GIT treated with APC and adrenaline and polidocanol injection therapy.

MATERIAL AND METHODS

The study presents 50 patients with bleeding angiodysplasia of the upper GIT confirmed by endoscopy. Endoscopic examination disclosed one or more bleeding lesions. According to applied treatment procedure patients were divided in two groups: 35 patients were treated with APC and the remaining 15 patients were treated with injection therapy using adrenaline and polidocanol solution. Both therapeutic options were carried out with endoscopic approach. During upper digestive endoscopy for the first group of patients treated with APC, a power of 30W and a flow rate of 1-2 L/min were used. The second group of patients was treated with injection therapy with adrenaline solution and a 1.5% solution of polidocanol, applied in and around the angiodysplasia lesion, in an amount of a maximum of 20 ml adrenaline solution and 1-2 ml of polidocanol solution, using a needle for endoscopic haemostasis. Patients were followed up for 6 months during 4 visits, at the zero point and after 4, 8 and 24 weeks. Endoscopic control was made on the second and third visit.

The data were statistically processed by (SPSSInc., Chicago, IL, USA) using the mean \pm standard deviation (SD) with 95% (CL), Chi-square test for qualitative marks and Student's t and Mann-Whitney-u- test for numerical characters. Probability (p) with a value <0.05 is considered statistically significant.

RESULTS

A total of 50 patients aged 18 to 64 years (average age of 55 years) were examined. Of these, 32 (64%) male and 18 (36%) female patients were treated at the University Clinic for Gastroenterohepatology in Skopje during the period of 2 years (Figure 1).

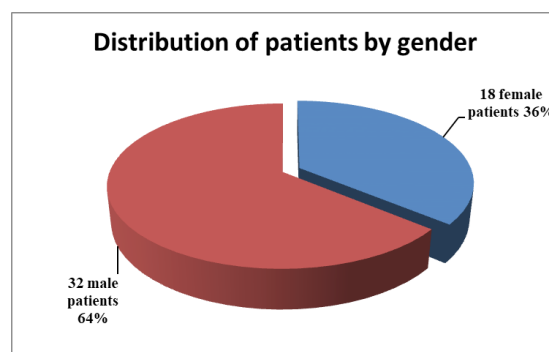


Figure 1. Distribution of patients by gender

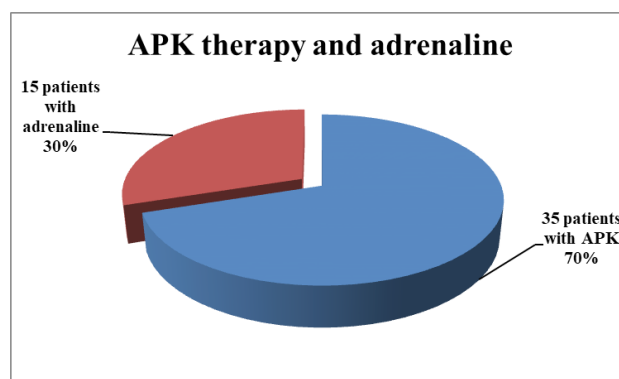


Figure 2. Distribution of patients according to the therapeutic approach of APC and adrenaline

According to the localization, a larger number of patients had angiodysplasia of the stomach 66% versus 34%. Table 2

Table 2. Localization of angiodysplasia lesion

Localization of lesion	Number of patients
Stomach	33 patients
Stomach and duodenum	17



Picture 1. Endoscopic image of angiodysplasia lesion

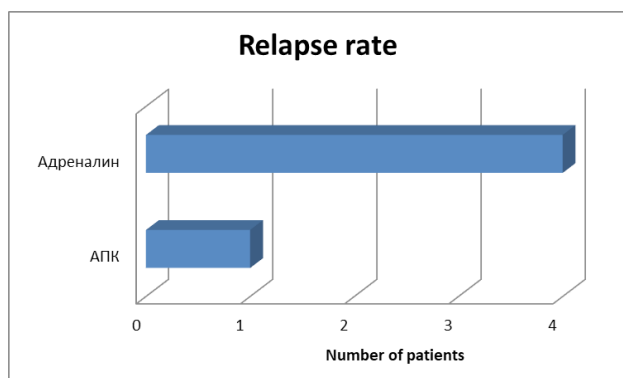


Figure 3.

Statistical analysis of the recurrent bleeding after the first treatment disclosed significant differences between the treatment with APC and injection treatment, (Mann-Whitney test $p < 0.01$). Statistically significant is the rate of bleeding relapse in patients treated with adrenaline.

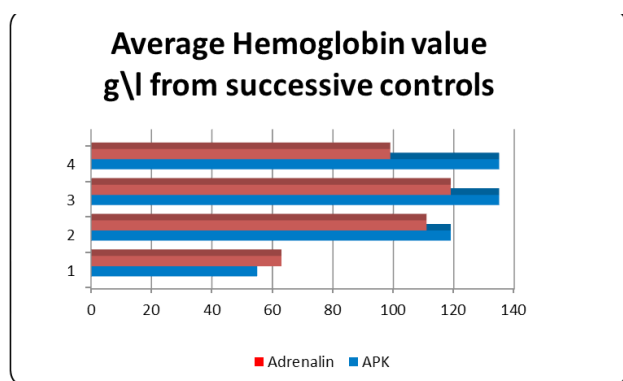


Figure 4. Average hemoglobin values (g/l) in the examined patients by successive 4 controls

An ANOVA Post Hoc test was performed on multiple sample comparisons and showed statistically significant $p < 0.05$. A more statistically significant difference was found in relation to both methods in the fourth control.

The blood transfusion was required in 34 patients (68%) during the first hospitalization.

DISCUSSION

A total of 50 patients with bleeding angiodysplasia diagnosed by endoscopy were examined. Clinical presentation was upper gastrointestinal bleeding and anemia. The average age of patients of 55 years coincided with literature data [2]. Regarding the distribution of patients by gender, the more numerous were male patients with 64%.

Bleeding from angiodysplasia can be controlled adequately by therapeutic endoscopy. 35 patients with bleeding angiodysplasia were treated with argon plasma, and 15 patients with adrenaline and sclerosing agent injection therapy. A higher degree of therapeutic efficacy was found in the group of patients treated with argon plasma compared to adrenaline and polidocanol solution injection therapy. The efficacy was considered by the higher rate of angiodysplasia lesion repair and a lower relapse rate. The results were similar as the literature data reports [2]. In another study there was no proven difference in treatment between conservative therapy and APA therapy [15, 17]. According to the lesion localization, a larger number of patients had angiodysplasia of the stomach 66% v. c. 34%, which correlate with the literature data [17, 18].

The first control endoscopy in all patients treated with argon plasma was within normal post treatment finding. The rate of recurrent bleeding with adverse lesions (ulcers) was statistically significantly higher in patients treated with adrenaline $p < 0.01$. More recurrent bleeding was observed in patients treated with adrenaline [19-22].

In terms of anemia, the average hemoglobin values after the intervention were statistically significantly higher in patients who were treated with argon plasma. Comparing the safety profiles in two treatment procedures, the rate of adverse effects was lower in patients treated with APC, unlike patients treated with adrenaline and polidocanol. The benefits of APC and a re-

duced percentage of recurrent bleeding and anemia have been demonstrated in literature studies [12]. A retrospective study of Saperas showed no difference with respect to the percentage of patients on re-bleeding compared to conservative therapy 87% versus 73% [15, 17].

CONCLUSION

Endoscopy is a gold standard method for diagnosis of angiodysplasia in the gastrointestinal tract. Treatment of bleeding angiodysplasia of the upper GIT with argon plasma is effective and safe treatment modality. This study, showed higher degree of therapeutic efficacy and low adverse effect (complications) in patients treated with argon plasma coagulation comparing with injection endoscopic procedures. It is recommended to use APC as the first line therapy for bleeding angiodysplasia.

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Резиме

СПОРЕДБА НА ТЕРАПИСКИОТ УСПЕХ СО АРГОН ПЛАЗМА КОАГУЛАЦИЈА И ИНЈЕКЦИСКА ТЕРАПИЈА СО АДРЕНАЛИН И ПОЛИДОКАНОЛ КАЈ КРВАВЕЧКИТЕ АНГИОДИСПЛАЗИИ ВО ГОРНИТЕ ДЕЛОВИ НА ГАСТРОИНТЕСТИНАЛНИОТ ТРАКТ

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Вовед: Ангиодисплазиите се аберантни крвни садови што се наоѓаат многу често во гастроинтестиналната мукоза и субмукоза. Ангиодисплазијата на желудникот и дуоденумот е причина за горно гастринтестинално крвавење кај 4–7 % од пациентите со ангиодисплазии и најчесто се лекуваат со ендоскопски методи, вклучително: аргон плазма коагулација (АПК), техники на електрокоагулација, механичка хемостаза со клипсирање, ласерска фотокоагулација и инјекциска терапија со склерозантни средства.

Цели: Да се спореди успехот од терапијата и појавата на несакани ефекти (улкусни лезии, перфорација) од терапијата со АПК и инјекциската терапија со раствор на адреналин и полидоканол во згрижувањето на крвавечките ангиодисплазии во горните делови на ГИТ.

Материјал и методи: Студијата е дизајнирана како проспективна и вклучува 50 пациенти со крвавечки ангиодисплазии на горен ГИТ. Од нив 35 пациенти беа третирани со АПК, а другите 15 пациенти со инјекциска терапија со раствор на адреналин и 1,5 % р-р на полидоканол аплицирани во самата ангиодисплазија и околу неа. Двете терапевски опции се реализираа со ендоскопски пристап. Пациентите се следеа во текот на шест месеци.

Резултати: Испитани се вкупно 50 пациенти на возраст од 18 до 64 години. Од нив 64 % машки и 36 % женски пациенти беа лекувани во текот на две години. Стапката на рецидивни крвавења и несакани ефекти беше статистички значајно повисока кај пациентите што беа третирани со адреналин $p < 0,01$. Потреба од трансфузија на крв имаа 34 пациенти (68 %) во текот на првата првата хоспитализација. Според локализацијата, поголем број пациенти имаа ангиодисплазии на желудник – 66 % наспроти 34 % во дуоденумот.

Заклучок: Ендоскопската процедура е златен стандард во дијагностицирањето и во лекувањето на ангиодисплазиите во гастроинтестиналниот тракт. Презентираната студија покажа дека третманот со АПК е со повисок степен на терапевска ефикасност и понизок степен на компликации и несакани ефекти во споредба со инјекциската терапија кај пациентите со крвавења од ангиодисплазија.

Клучни зборови: ангиодисплазија, горнодигестивна ендоскопија, аргон плазма коагулација