

Sclerosis of Fundic Varices. Experience in a Reference Center in the South West of Colombia, 2011-2017

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ABSTRACT

Treatment of variceal bleeding in the esophagus and fundus is a clinic challenge which sometimes leads to seeking alternative management

for this type of patients. This study was carried out to make known the demographic characteristics of patients with gastric varices with or without the presence of esophageal varices that were taken to cyanoacrylate sclerotherapy (CYP). Endoscopic findings, outcomes and complications are described. Data used to evaluate the safety and efficacy of the procedure in the management of patients with or without active variceal bleeding.

This observational descriptive retrospective cross-sectional study included patients with manifest portal hypertension with esophageal and fundic varices, a total of 132 sclerotherapy procedures with cyanoacrylate mixed with lipiodol.

We included 132 records of sclerotherapy with CYA, with equal gender distribution. Esophageal varices were found in 90.2% (119 records). In 31 procedures the indication was emergency bleeding (23.5%), of these 7 had CP-A, 12 CP-B, 0 CP-C and 12 without data. Out of the 101 elective interventions, 34 had CP-A, 24 CP-B, 6 CP-C and 37 without data, with no significant differences between groups (p value = 0.1). Homeostasis was achieved in 100% of patients with active bleeding. Variceal sclerosis was successful with a single puncture in 81.1%, two punctures in 13.6% and three or more in 5.3% of the procedures. There were no complications in any of the patients, nor damage in the equipment used. In conclusion Endoscopic obliteration of fundic varices with CYP was safe and effective in the treatment of upper gastric variceal bleeding, without clinical complications in the procedure or damage to the endoscopic equipment used.

Key words: Portal hypertension; Varicose vein sclerosis; Cirrhosis

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INTRODUCTION

Portal hypertension secondary to cirrhosis or other conditions leads to

the formation of esophageal and fundic varices that are collateral venous that communicate the portal circulation with the systemic. The prevalence of esophageal varices in patients with cirrhosis is 50% and there is a direct relationship between the presence of varices and the development of complications of liver disease. Esophageal and fundic varicose veins may be present in 40% of patients with Child-Turcotte-Pugh class A and up to 85% of patients with Child-Turcotte-Pugh class C^[1,2]. The development and growth of gastroesophageal varicose veins occur at a rate of 7-8% per year and the rupture rate at one year is approximately 5-15% depending on the size of the varicose veins^[3,4].

The development of esophageal and gastric varices usually occurs when the clinically significant portal hypertension threshold is exceeded, defined as a hepatic venous pressure gradient greater than 10 mm Hg. Portal hypertension results from increased intrahepatic resistance due to distorted parenchymal architecture, endothelial dysfunction leading to intrahepatic vasoconstriction and short intrahepatic vascular circuits between afferent and efferent vessels, as well as the compensatory increase in splanchnic flow that contributes to the maintenance of hypertension^[4].

Primary and secondary prophylaxis is aimed at modifying the development of complications associated with hypertensive bleeding and its mortality. Depending on the scenario, drugs are used that finally decrease the portal pressure gradient by different mechanisms, among these, we find splanchnic vasoconstrictors, such as terlipressin, somatostatin, and adrenalin; non-selective adrenergic beta-blockers that also decrease the portal flow, with propranolol and nadolol being the most representative^[5].

Endoscopic therapy using ligation and sclerotherapy of varicose veins has changed the prognosis and mortality of patients presenting with acute bleeding or for prophylactic management. Sclerotherapy of varicose veins with cyanoacrylate (Histoacryl® N-butyl cyanoacrylate or Dermabond® 2-octyl cyanoacrylate), has a high success rate, above 90%, in the primary control of bleeding, with similar efficiency for both products.

The aim of this study is to present the demographic characteristics of patients undergoing sclerotherapy of gastric varices with N-butyl cyanoacrylate, attended at the Valle del Lili Foundation, a highly complex reference center, describing endoscopic findings, outcomes obtained and complications.

MATERIAL AND METHODS

A descriptive observational retrospective cross-sectional study was conducted, which included the population over 18 years of age who underwent fundic variceal sclerosis with cyanoacrylate - lipiodol in the endoscopy unit of a highly complex reference center in the city of Cali, Colombia. The data were collected from clinical histories where the reports of endoscopic procedures performed between 2011 and 2017 were reported. Sclerosis of fundic varices was performed by means of endoscopy and injection with an injector needle of cyanoacrylate (sclerosing agent) mixed with lipiodol (an agent that delays polymerization to generate sclerosis on contact with the vehicle (blood) of the variceal package).

A descriptive statistical analysis was performed using STATA v.14®. Proportions were established for qualitative variables and central trend measures and their respective dispersion measures for quantitative variables, according to the normal distribution identified with Shapiro Wilk's test. A bivariate analysis was performed with the Fisher test to compare the requirement of the number of punctures according to the clinical indication of the procedure and classification Child-Pugh (CP) presented by the patient at the time of the intervention.

RESULTS

The study included 68 patients with a total of 132 procedures performed with CYA, the mean age was 64 years (52.5-70.5 years), 34 men. 31.1% (41 records) of the procedures were performed on patients presenting CP-A, 27.3% (36 records) CP-B, 4.5% (6 records) CP-C and 37.1% (49 records) without data. Of the 132 CYA sclerotherapy registers, esophageal varices were found in 90.2% of cases (119 registers), while there was no evidence of esophageal varices in 8.3% of cases (11 registers) and in 1.5% of cases no data were found (2 registers). There were 31 emergency patients with active bleeding (23.5%) and 101 (76.5%) elective sclerotherapies. The Child's classification of patients treated for active bleeding was as follows: CP-A 7 patients, CP-B 12 patients, and 12 no data. The 101 elective patients were classified as CP-A 34, CP-B 24, CP-C 6 and 37 with no data to classify them; there were no significant differences in the distribution between the groups (p -value = 0.1) (Table 1).

The number of injections needed to achieve sclerosis, or bleeding control, which was the primary objective of the procedure, was evaluated during the operative part. In 81.1% of cases, a single injection was performed (107 procedures), in 13.6% of cases two injections (18 procedures) and 5.3% of cases three or more injections (7 procedures). As for the number of injections required according to Child's classification, the distribution was CP-A (n = 41), one injection 85.4% of the cases (35 procedures), two injections 14.6% (6 procedures) and no patient required more than three injections. In CP-B patients (n = 36), only one injection was performed in 28 patients (77.8%), two injections in 4 patients (11.1%) and three or more injections in 4 patients (11.1%). For the CP-C group (n = 6), 3 patients (50%) required 1 injection and 2 injections in the other 3 patients (Table 2).

Sclerotherapy was performed under sedation in 98.5% of interventions (130 registers). None of the complications described as uncontrollable bleeding during the procedure, need for surgery and/or hospitalization, gastric or esophageal perforations, embolic complications and death occurred during the 132 sclerotherapies performed. Additionally, there was no damage to the endoscopic equipment used for the procedure.

DISCUSSION

Gastric varices are present in approximately 18-75% of patients with portal hypertension and variceal bleeding is one of the main complications of it with an associated high morbidity and mortality depending on the state of the hepatic disease and the type and charac-

Table 1 Frequency of intraprocedural bleeding according to Child-Pugh of the patient.

| Child-Pugh n (%) | Indication | | p-value |
|------------------|-------------------------|----------------------|---------|
| | Active Bleeding, n = 31 | No Bleeding, n = 101 | |
| - A | 7 | 34 | |
| - B | 12 | 24 | 0,100 |
| - C | 0 | 6 | |
| - No Data (%) | 12 | 37 | |

Table 2 Bleeding control with the number of punctures.

| Number of punctures n(%) | Child-Pugh Classification | | |
|--------------------------|---------------------------|-----------------|----------------|
| | Child A, n = 41 | Child B, n = 36 | Child C, n = 6 |
| 1 | 35 (85.4) | 28 (77.8) | 3 (50) |
| 2 | 6 (14.6) | 4 (11.1) | 3 (50) |
| 3 or more | 0 (0) | 4 (11.1) | 0 (0) |

teristics of gastric and/or esophageal varicose veins; rupture of gastric varicose veins generally results in more severe bleeding and higher mortality^[10]. The treatment of these patients requires an appropriate endoscopic management, which is often difficult and must always be associated with the use of vasoactive drugs, in cases where it is not possible to control with these methods, the use of percutaneous portosystemic bypass procedures is the alternative control method for bleeding from gastroesophageal varices, however, the availability of these procedures limits in our environment its wide use.

This retrospective study, with data obtained in a single center in the country on the use of cyanoacrylate endoscopically for the sclerosis of fundic varices, agrees with the results published by Kim SJ *et al*^[10] and Lizardo-Sánchez, *et al*^[11], demonstrating that the use of endoscopic cyanoacrylate injection is very effective and has an adequate safety rate in patients with variceal bleeding.

In our study, hemostatic control was achieved in 100% of CYA sclerosis caused by emergency bleeding. Previous studies such as Tantau *et al*^[12] and Serón P^[13] have shown that cyanoacrylate is not inferior to treatment with ligation of varicose veins and its results are equivalent to the use of TIPS (Transjugular intrahepatic portosystemic shunt) as shown in the study by Procaccini *et al*^[4], without the presence of technical problems such as development of portal vein thrombosis, and encephalopathy described with the use of TIPS (Transjugular intrahepatic portosystemic shunt). The advantages of cyanoacrylate sclerotherapy include direct bleeding control and evaluation, increased reliability, reduced equipment requirements, use of conventional supplies such as standard sclerotherapy needles, rapid bleeding control, and low probability of endoscope damage using the appropriate technique.

The population of this study corresponded to 68 patients who underwent fundic variceal sclerosis between 2011 and 2017, with clinical evidence of portal hypertension and presence of fundic varices, for a total of 132 procedures performed, with indication of the procedure by active bleeding in 23.5% of patients and resolution of bleeding in 100%, without evidence of episodes of rebleeding. 81.1% of patients required a single puncture for resolution of bleeding, and 18.9% required 2 or more punctures for effective hemostatic control. These highly effective results in initial hemostasis can be attributed to the nature of cyanoacrylate, which polymerizes and hardens immediately upon contact with blood, allowing immediate control of active bleeding.

It is important to highlight that in this study there were no immediate complications described in the reading as fever, abdominal pain, bacteremia, thrombotic phenomena including pulmonary thromboembolism, with the limitation that was not performed in the present study long-term follow-up and what was reported is only in the immediate postprocedure. Previous publications have described the relationship between these complications and the rate of infusion and the total amount of cyanoacrylate used. In the study there was no rebleeding in the immediate perioperative (surveillance time in endoscopic area) in any of the patients, without being comparable with that described by Rengstorff *et al*^[15], in which recurrence of hemorrhage by gastric varices was observed in 4% of the patients since there was no long-term follow-up and the highest rate of rebleeding occurs in the first month and year depending on the stage of cirrhosis.

The limitations of this study include its retrospective nature and the difficulty in the further follow-up of patients within months due to the elective characteristic for which they were referred from other institutions, which precluded appropriate long-term clinical follow-up due to the tertiary derivation of our health system. However, it is considered that the cyanoacrylate sclerosis procedure and technique

for the management of fundic varices was effective and safe, which benefits the population with portal hypertension with a high risk of variceal bleeding, or its recurrence. The use of cyanoacrylate-type tissue adhesives has demonstrated in previous studies high effectiveness and a suitable safety profile, it is configured as an option within the arsenal of treatment in case of bleeding in decompensated cirrhotic patients.

In conclusion, endoscopic injection with 2-octyl cyanoacrylate (CYA) appears to be effective and safe for the obliteration of gastric varices with rapid and effective bleeding control, with a low complication rate and equally low risk of rebleeding compared to medical management especially in patients at high risk of complications.

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