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Research Article

Hemostatic Endoscopic Treatment of Gastroduodenal Varices by Chemical Glue Mixed with Glucose Serum: Experience of Hassan II University Hospital Center

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Abstract

Introduction: Gastrointestinal haemorrhage by rupture of gastroduodenal varices has an incidence of 3 to 30% and represents approximately 10% of all upper gastrointestinal haemorrhages associated with portal hypertension (PHT). The aim of this work is to evaluate the therapeutic efficiency and complications of diluted chemical glue injection in glucose serum as an endoscopic haemostasis technique.

Materials and Methods: It's about a retrospective study of 25 patients compiled between January 2012 and September 2018. All patients were admitted with upper gastrointestinal bleeding. They all had benefited from a gastroscopic fibroscopy that had objectified bleeding caused by rupture of gastroduodenal varices. Methacryloxysulfolane-associated n-butyl-2-cyanoacrylate (Glubran 2) was prepared with glucose serum 5%. The endoscopic treatment performed under sedation, consists of the injection of chemical glue at the level of gastroduodenal varices.

Results: The average age of our patients was 53,4 years [26 years - 98 years]. A female predominance was noted, with a sex ratio F/H: 2.12. Glucose injection into gastric varices was performed in 23 patients (92%) of whom 09 had GOV2 (36%), 7 had IGV1 (28%), 2 had GOV1 (7%). Ectopic duodenal varicose veins were found in 2 patients (8%). The injection was performed at one or two sites of the ruptured varice. The initial haemostasis was obtained in 100% of cases. No immediate or delayed complication was noted.

Conclusion: Our results confirm that endoscopic hemostatic treatment of hemorrhages From ruptured gastroduodenal varices by chemical glue diluted in glucose serum is effective and less expensive compared to dilution in Lipiodol which is not always available in our context.

Keywords: *Gastroduodenal Varices; Methacryloxysulfolane-associated n-butyl-2-cyanoacrylate (Glubran 2); Chemical Glue; Lipiodol*

Abbreviations

GOV: Oeso Gastric Varices; IGV: Isolated Gastric Varicosis; Glubran 2: N-butyl-2-cyanoacrylate associated with Methacryloxysulfolane

Introduction

Gastric variceal bleeding is a challenge with worst outcomes than oesphageal variceal. Current guidelines recommend endoscopic therapy as first-line with N-Butyl-2 Cyanoacrylate Metacrilosisolfolano (NBCM-GLUBRAN 2®) obturation. To prevent the glubran from polymerizing too quickly, it's often diluted with lipiodol. This effective therapy is not perfect with up to 5 to 10% of rebleeding and serious complications. because of the high rate and the unavailability of lipiodol in our context, we opted for a cheaper solution that seems as effective as lipiodol which is glucose serum.

Aim of the Study

The purpose of this work is to estimate the therapeutic efficiency and the complications of the injection of chemical glue diluted with glucose solution 5% as a technique for endoscopic hemostasis.

Patients and Methods

This is a retrospective study concerning 25 patients collected between 2012 and September 2018. All of the included patients were admitted for upper gastrointestinal bleeding, they all underwent an oesogastroduodenal endoscopy which objectified a bleeding caused

by the rupture of gastroduodenal varicose veins. Patient's consent was mandatory before the procedure. The endoscopic treatment, realized after stabilizing the general condition, consisted in the injection of chemical glue prepared with N-butyl-2-cyanoacrylate associated with Methacryloxysulfolane (Glubran 2) mixed to glucose serum 5%.

Exclusion criteria: Were excluded the patients presenting an upper digestive bleeding caused by other etiologies (bleeding of esophageal varicose veins, gastroduodenal ulcers…).

Technique of realization:

- The procedure is realized under sedation, purge the needle with 1,5 ml of glucose serum.
- Introduce 23 G the needle into the varice vein, inject 1.5 ml of mixture, inject 1.5 ml of glucose serum Let the needle at least 5 seconds into the varice and then take it out carefully.
- Repeat the procedure until the varice became hard without exceeding 4 injections.
- Strict surveillance of the hemodynamic parameters.

Results

The mean age of our patients was 53.4 years old. We notified a female predominance with a sex ratio F/M: 2.21.12 patients had a viral cirrhosis most patients (48%) were scored. As far as the hemodynamic concerned, most of our patients were stable (68%). Almost half of our patients had an hemoglobin level lower than 7 With an average loss of hemoglobin of 2.5 points which required a blood transfusion in 23 of them (92%) (Table 1).

	N = 25 Percentage (%)
*Mean age [Y]	53,4 [26/98]
*Women/ Men [Sex Ratio]	17/8 [2,12]
***Etiology of gastric Varices cirrhosis**	
• Hepatitis C	10 (40%)
• Hepatitis B	2 (8%)
• Auto Immune Hepatitis	1 (4%)
• Alcoholism	0 (0%)
• Portal cavernom	2 (8%)
• Idiopatic	10 (40%)
***Child-Pugh status**	
• Child A	12 (48%)
• Child B	11 (44%)
• Child C	2 (8%)
***Hemodynamic stability**	
• Stable	17 (68%)
• Unstable	8 (32%)
***Hemoglobin**	
• < 7	14 (56%)
• [7;10]	9 (36%)
• 10	2 (8%)
*Déglobulisation [Y]	[2,5]
*Transfused patients	23 (92%)
*Average number of session	1,6

Table 1: *General characteristics of patients.*

Glucose injection into gastric varices was performed in 23 patients (92%) of whom 09 had GOV2 (36%), 7 had IGV1 (28%), 2 had GOV1 (7%). Ectopic duodenal varicose veins were found in 2 patients (8%). The injection was performed at one or two sites of the ruptured varice. We didn't find any esophageal varices in 6 patients.

While practicing the EGDF we notified an active bleeding in 7 cases (28%) and recent bleeding in 18 cases (72%) (Table 2). The initial haemostasis was obtained in 100% of cases. No immediate or delayed complication was noted. 2 patients (8%) died because of a short term recurrence (Table 3).

	N = 25	Percentage (%)
***Location of gastric varices (GV)**		
GOV 1	7	28%
GOV 2	9	36%
IGV 1	7	28%
IGV 2	0	0%
Duodenal	2	8%
***Average Size of GV**		
<15 mm	10	40%
[15;25]	10	40%
> 25	5	20%
*** Oesophageal varices**		
None	6	24%
Grade I	8	32%
Grade II with RC	9	36%
Grade II without RC	2	8%
Grade III	0	0%
*Active bleeding	7	28%
*Recent bleeding	18	72%

Table 2: *Endoscopy data.*

	N = 25	Percentage (%)
*Rate of initial hemostasis	25	100%
*Immediate or delayed complication	0	0%
*Recurrence		
Short term	4	16%
• Encollage with good evolution	2	8%
• Death	2	8%
Long Term	4	16%
• Encollage with good evolution	4	16%
• Death	0	0%

Table 3: *Evolution of patients who have benefited from chemical glue.*

Discussion

The frequency and the severity of the bleedings by rupture of gastric varices depend on their localization [1-6]. There are four types of gastric varices: gastro-esophageal type I (GOV1) which corresponds to the esophageal varicose veins and which goes on below the oeso-gastric junction, gastro-esophageal type 2 (GOV2) and the gastric - isolated varicose veins (IGV1) which correspond to fundic - associated varices (GOV2) or (IGV1) with the esophageal varicose veins. Other gastric varicose veins localized at the level of the stomach's body, in the cave, in the pylorus or in the initial part of the duodenum, are the isolated gastric varicose veins of type 2 (IGV2) [6-8]. The GOV2 bleeds more often than the GOV1 (55 vs. 12%) [9] and their forecast is more difficult in case of secondary GOV2 and IGV2 compared to IGV1, although the hemorrhagic risk is lower 6% [6].

The mortality rates secondary to rupture of gastric varicose veins is 45 to 55% [6,9]. The presence of gastric varicose veins would increase the global hemorrhagic risk to 2,5 times (69% vs. 24%) and would aggravate the forecast of the risk of having a portal hypertension [10]. The efficacy of chemical glue in the treatment of gastric varicose veins is now established. it was described first by Lunderquist., et al. in 1978 [11]. Later in 1986, Soehendra., et al. [12] reported the first series of endoscopic treatment of gastric varicose veins. Since then, a significant number of series showed a rate of 90% hemostasis [13,14]. The techniques of hardening with injection of chemical glue, Histoacryl (n-butyl-2-cyanoacrylate) or Glubran 2 (n-butyl-2-cyanoacrylate associated with Methacryloxysulfolane) has been developed. These glues solidify immediately in the contact of the blood and allow an immediate closing of varicose veins. Contrary to sclerosing products, the ulcerations with eviction of the mold of glue are late- arising (2 weeks to 3 months after the injection [15] and allow to partially explain the decrease in the risk of premature hemorrhagic secondary offenses.

The histoacryl is usually diluted with Lipiodol which has the additional property to allow the radiological confirmation of the injection and the identification of the embolisation. The glue has a viscosity similar to water, while Lipiodol is very viscous and produces the difficulty in the injection of the mixture [16]. Glubran 2 has a longer duration of polymerization and does not necessarily require a dilution with Lipiodol [13]. This is interesting, especially as Lipiodol is dear and not always available.

Few studies in the literature were interested in the dilution of chemical glue (Glubran 2) with another product delaying the polymerization other than Lipiodol from where the interest of our study.

A Brazilian study [17], led between 2009 and 2010, tried to estimate the importance of dilution of Glubran 2 with some distilled water. Twenty one patients were included in the study and benefited from injection of Glubran 2 mixed with water distilled to calcify the gastric varicose veins. The initial hemostasis was obtained in all the patients and no damages of the endoscope tube or major complication were reported, except epigastric pain in three patients. One patient presented a hemorrhagic secondary offense six months later. This study showed that the injection of Glubran 2 mixed only with distilled water is safe and effective for the hardening of the gastric varicose veins.

An Egyptian study [17] led in April 2015 tried to compare n-butyl-2-cyanoacrylate, iso-amyl-2-cyanoacrylate and a mixture of 72% of chromate glycerin with hypertonic glucose 25% in the management of gastric varices. Ninety patients who were presented with gastric varicose veins at the unity of endoscopy at The University Hospital of Ain Shams were included. They were distributed at randomization in three groups; every group included 30 patients handled by sclerosant injections in twice-weekly sessions until complete closing of the gastric varicose veins. Group I, II and III were treated respectively by (n-butyl-2- cyanoacrylate; Histoacryl), (iso-amyl-2- cyanoacrylate; Amcrylate) and a mixture of 72% of glycerin and chromium Scleremo with glucose serum 25%]. All the procedures were electively made without active bleeding. The recruited patients were supervised during three months. There was a secondly bleeding in 13.3% of the Histoacryl and Amcrylate group versus 0% in the group with Scleremo. The mortality rate was 6.6% in both Histoacryl and Amcrylate groups, while it was 0% in the Scleremo group. In the first and second sessions, the necessary quantity of Scleremo for closing was sufficiently available, whereas the quantity of Histoacryl was very low. Besides, Scleremo was the least expensive of both treatments. The study concluded that all the sclerosing substances used showed an efficiency and a success in the management of the gastric varicose veins, but the cost and the global amount of the third group were much lesser compared to the first ones.

Our study, using Glubran 2 mixed with serum glucose 5%, showed its efficiency in the initial hemostasis of bleeding gastroduodenal varicose veins and. there were no initial or delayed complication and the process proved to be much less expensive than the dilution with Lipiodol.

Conclusion

Our results confirm that chemical glue diluted in glucose serum is an affective, safe and affordable endoscopic hemostatic treatment of hemorrhages due to ruptured gastroduodenal varices.

Conflict of Interest

There is no conflict of interest.

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