EFFECTIVENESS OF HISTOACRYL INJECTION IN THE MANAGEMENT OF FUNDAL VARICEAL BLEEDING

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ABSTRACT

Objectives: To assess the effectiveness of Histoacryl glue in the treatment of haemorrhage due to varices in the gastric fundus.

Materials and Methods: This cross-sectional research was carried out at the Department of Gastroenterology of Hayatabad Medical Complex, Peshawar. All those with haemorrhage from varices in the fundus were included in the study after application of exclusion criteria. A comprehensive gastroscopy was conducted after patients were stabilized and the source of haemorrhage from varices in the gastric fundus was confirmed, after which histoacryl glue was administered into these varices via a needle, and hemostasis achievement was observed. All data were analyzed using SPSS 22, and descriptive statistics were computed for the study variables.

Results: A total of one hundred and forty-nine participants having haemorrhage from varices in the gastric fundus were examined, out of which 59.73% (n=89) were male, and 40.26% (n=60) were females. The most common age group of patients was 40 – 50 years, having 42.28% (n=63) of patients. The majority (86.57%) of the patients had OGV-II type of varices, hence being the commonest. The most common reason for having varices in the gastric fundus was cirrhosis (73.82%). Hemorrhage was controlled successfully in 98.65% of patients after one session of histoacryl application.

Conclusion: Endoscopic injection of N-butyl-2-cyanoacrylate (Histoacryl) achieved immediate hemostasis after a single session in our study, indicating that Histoacryl is a highly effective first-line therapy for acute bleeding from fundal varices. Further prospective studies with longer follow-up are warranted to assess rebleeding rates and long-term outcomes.

Keywords: Histoacryl, fundal varices, upper gastrointestinal bleeding

INTRODUCTION

Emergence of varices in the gastric fundus in the presence or absence of esophageal varices is a frequent problem in patients with portal hypertension.[1] It can arise from cirrhosis or non-cirrhotic portal hypertension and can result in severe hemorrhage. Although bleeding from varices in the gastric fundus is less frequent than compared of esophageal varices but it carries more severity and mortality.[1,2] This heightened morbidity and mortality associated with these varices can be attributed to different factors such as the larger size of gastric varices, their deeper anatomical location, straight drainage into larger veins, and exposure to the gastric acidic environment and gastric enzymes like pepsin.

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These varices are classified by Sarin et al as gastroesophageal varices (GOV) and isolated gastric varices (IGV).[3] Those that spread below the esophagogastric junction towards the lesser curve of the stomach are type 1 GOVs (GOV1), while those running toward the gastric fundus are type 2 GOVs (GOV2). Isolated gastric varices are further classified into two types: type 1 IGV (IGV1), which are those that are exclusively found in the gastric fundus, while type 2 IGVs (IGV2) are situated in other areas of the stomach, as illustrated in Figure 2. Controlling bleeding from these varices is the goal of treatment after resuscitation of the patient with IV fluids, blood transfusion, and vasoactive medicines. Different endoscopic interventions involved in the management of these varices include banding, sclerotherapy, and histoacryl injection. Out of all these interventions, injecting histoacryl is preferred due to its superior effectiveness. It contains N-butyl-2-cyanoacrylate glue, which is utilized to control bleeding from fundal varices. It quickly hardens after coming in contact with aqueous medium or blood.[4] Presently, it is regarded as the most preferred method by specialists to control bleeding from varices in the gastric fundus.[5] Many studies have shown the effectiveness of Histoacryl in controlling

bleeding from gastric varices. In a study by Rengstorff and Binmoeller, with histoacryl injection, hemostasis was achieved in 100% of cases of bleeding from gastric varices, while in another study by Khawaja et al., a similar outcome was observed with this technique.[11,12] Additionally, Mumtaz et al. also demonstrated 100% control of bleeding from gastric varices with histoacryl injection.[13] This study aimed to evaluate the effectiveness of histoacryl injection for the treatment of hemorrhage from varices in the gastric fundus in our local context, as such data is limited and lacking in our local resource-limited setting. It will help us guide local authorities and guideline-forming bodies to formulate local polices and management guidelines regarding the management of patients with bleeding from gastric varices.

MATERIALS AND METHODS

This cross-sectional study was carried out in the Department of Gastroenterology of Hayatabad Medical Complex, Peshawar, spanning from June 1, 2023, to June 30, 2025. Approval was taken from the hospital's research and ethics committee (IREB approval No 2660, dated 10-07-2025). Written informed consent was taken from all patients.

One hundred and forty-nine (149) patients were included in this study. All patients aged between 40 and 65 years, regardless of gender, reporting with hematemesis or melena due to varices in the fundus of the stomach were included in this study based on non-probability convenience sampling following thorough history taking, examination, and needful investigations.

Comprehensive gastroscopy was conducted on all patients presenting with upper gastrointestinal bleeding, during which diagnosis of bleeding from gastric varices was confirmed based on the presence of endoscopic red signs on these varices or active spurting from them, and histoacryl was injected into to varices in the fundus during the same session. Achievement of hemostasis was observed and documented. Patients with other sources of bleeding, like oesophageal varices, esophagitis, malignancy, peptic ulcer disease, etc, were excluded.

Data concerning demographic profile, history of upper GI bleed, related medical conditions, and medication, etc, was gathered and recorded in a specifically designed proforma. All information was analyzed on SPSS 22 software. Mean and standard deviation were calculated for age, while frequency and percentages were computed for categorical variables.

RESULTS

This study involved 149 patients having haemorrhage from varices in the fundus of the stomach. Among these participants majority were male patients, i.e., 59.73% (n=89), as shown in **Table 1**.

Ages of patients varied between 40 to 65 years with a mean age of 53.01 years ±7.9 SD. The majority of the patients, i.e., 42.28% (n=63), were in the age group of 40 – 50 years **Table 1**.

Upper GI endoscopy revealed type II gastroesophageal varices (GOV II) to be most prevalent, i.e., 86.57 % (n=129), as depicted in **Table 1**.

Cirrhosis was identified as the most common cause of varices in the gastric fundus, being present in 73.82% (n=110) patients, while chronic portal vein thrombosis was the second most common cause present in 24.16% (n=36) patients, as evident in **Table 1**.

Haemorrhage was completely stopped with one session of histoacryl injection in 98.65 % (n=147) patients, as shown in **Figure 1**.

Table 1: Gender, Age groups, Types and Causes of Fundal varices

		Number of patients (%)
GENDER	Male	89 (59.73%)
	Female	60 (40.26)
AGE GROUPS	40 – 50 years	63 (42.28 %)
	51 – 60 years	56 (37.58 %)
	61 – 65 years	30 (20.14 %)
	Total	149 (100%)

VARICIAL TYPE	gastroesophageal varices type II	129 (86.57 %)
	isolated gastric varices	20 (13.43 %)
CAUSE OF FUNDAL VARICES	cirrhosis	110 (73.82 %)
	Chronic portal vein thrombosis	36 (24.16 %)
	Isolated splenic vein thrombosis	3 (2.01 %)

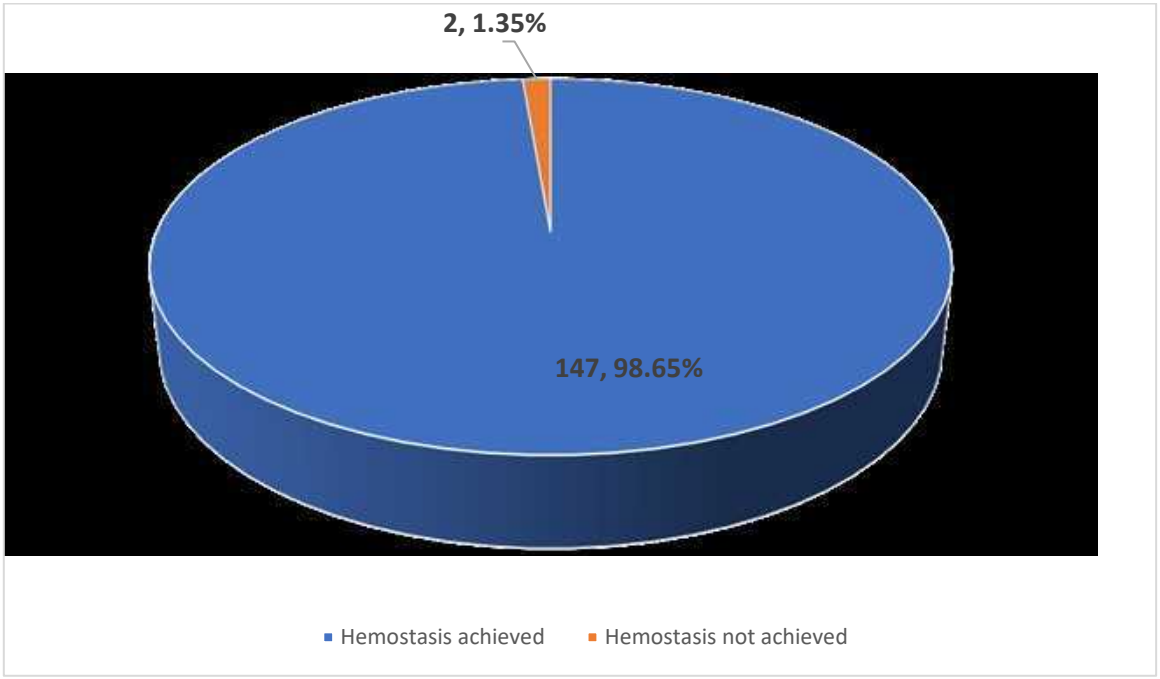

Figure 1: efficacy of histoacryl

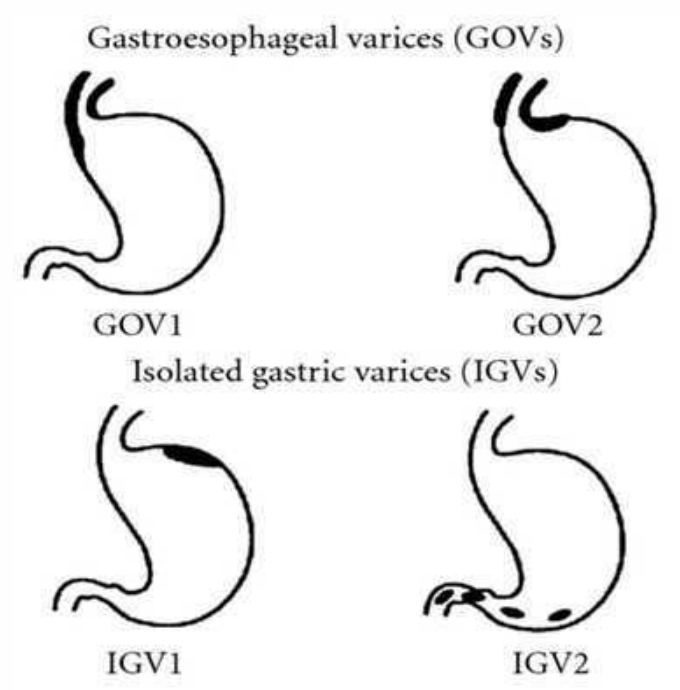

Figure 2: Types of gastroesophageal varices

DISCUSSION

Bleeding from gastric varices is more severe and associated with a greater risk to life as compared to other sources of bleeding, like oesophageal varices, etc [1,2]. Various endoscopic techniques have been employed for effective control of bleeding from these gastric varices, with histoacryl injection being one among many. In our study, 149 patients with bleeding from fundal varices were included. Histoacryl was injected into the fundal varices in all these patients, and 98.65 of % patients achieved hemostasis among these patients.

Gotlib and Zimmermann initially documented the use of cyanoacrylate injection endoscopically for the management of bleeding gastric varices, followed by Soehendra et al., who also mentioned rapid cessation of bleeding from these varices through injection of cyanoacrylate into them.[6,7] currently, guidelines from ASGE, Baveno consensus, NICE, and AASLD guidelines also endorse this approach.[5,8–10]

Numerous studies have demonstrated the efficacy of Histoacryl in attaining hemostasis in cases of bleeding from gastric varices. In research conducted by Rengstorff and Binmoeller, histoacryl injection resulted in prompt control of bleeding in 100% of cases of bleeding from gastric varices, while another study by Khawaja et al. also provided evidence of the same outcome with this technique.[11,12] Additionally, Mumtaz et al. also showed a 100% success rate in control of bleeding from gastric varices with histoacryl injection.[13] Our study corroborated these findings, revealing a success rate of 98.65% in achieving control of bleeding from gastric varices using cyanoacrylate injection. In our study, just two patients had rebleeding from gastric varices after an initial attempt to control bleeding with cyanoacrylate injection, and they were subsequently referred to a facility equipped with TIPS.

Furthermore, in various studies and meta-analyses, it has been shown that cyanoacrylate injection has better efficacy than band ligation in controlling bleeding from gastric fundal varices.[1,14] Different possible explanations for this superiority includes 1) the potential for the rubber band to detach/slip from the banded gastric varix due to stomach motility, while there would be no such problem in an injected gastric varix 2) banding primarily effects and captures vessels located superficially in mucosa and submucosa, whereas cyanoacrylate effectively blocks and obliterated variceal vessels in a broader and deeper region 3) when injected in to the varix, cyanoacrylate promptly polymerizes up on coming in contact with aqueous medium of the blood and occludes the varix immediately, whereas with banding the varix is strangulated and constricted gradually that ends in necrosis of the varix.

In general, cyanoacrylate is currently the preferred primary management option for the management of bleeding from varices in the gastric fundus, demonstrating superior efficacy in achieving initial hemostasis, advantages over banding, and superior overall survival benefits in comparison to both banding and sclerotherapy.[5,14–18]

This study has several limitations. First, its cross-sectional design does not allow assessment of long-term outcomes such as rebleeding rates, complications or mortality following Histoacryl injection. Second, the study was conducted at a single tertiary-care center using non-probability convenience sampling, which may limit the generalizability of the results to broader populations. Third, no control or comparison group (e.g., band ligation, sclerotherapy, or TIPS) was included, restricting the ability to compare the efficacy of Histoacryl with other therapeutic modalities. Despite these limitations, the study provides valuable local data supporting the effectiveness of Histoacryl for acute bleeding from fundal varices.

CONCLUSION

Upper gastrointestinal bleeding resulting from varices in the gastric fundus represents a critical condition frequently encountered in gastroenterology departments. Endoscopic histoacryl injection has been the preferred endoscopic technique for achieving hemostasis and obliterating these gastric fundal varices in such cases. Our study demonstrated the significant effectiveness of histoacryl injection for achieving hemostasis in patients with fundal variceal bleeding.

DECLARATIONS

Authors contributions

- **Dr. Muhammmad Shoaib Khan:** Contributed to the conception and design of the study, performed analyses, participated in data interpretation, drafted the initial

manuscript, and critically revised it for important intellectual content.

- **Dr. Iltaf:** Contributed to data analysis and interpretation, manuscript drafting and revision, and approved the final version of the manuscript.
- **Dr. Naeem Jan:** Contributed to study conceptualization and design, participated in manuscript drafting and critical revision, and approved the final version.
- **Dr Imran Ullah:** Contributed in data analyses, contributed to data acquisition and manuscript drafting, and reviewed the manuscript for important intellectual content.
- **Dr Adnan ur rehman:** Provided study supervision and conceptual guidance, contributed to study design and interpretation, critically reviewed the manuscript for intellectual content, and approved the final version for publication.

Acknowledgments: Nil

Conflicts of Interests: Nil

Funding: Nil

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