Endoscopic injection of Histoacryl® in the treatment of recurrent hematuria secondary to bladder varices

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ABSTRACT

Introduction: Macroscopic hematuria involving bladder varices is a rare presentation to Emergency Department (ED). Its presentation warrants immediate diagnosis and management to prevent severe anaemia and hypovolaemia. Injection therapy may be an option that can be offered as an alternative procedure to treat gross hematuria. It is considered less invasive when compared to an open surgery especially in high morbidity patients. We described an alternative treatment modality in the treatment of bleeding bladder varices using endoscopic injection of Histoacryl® (N-butyl-2-cyanoacrylate). Case report: This case report describes a female patient who presented to the ED with bleeding bladder varices secondary to portal hypertension in an ileal augmented bladder. The report discusses an alternative treatment modality to treat bleeding bladder varices using endoscopic injection of Histoacryl® (N-butyl-2-cyanoacrylate). Discussion: Macroscopic hematuria is a common presentation to the Emergency Department (ED). Nevertheless, hematuria secondary to urinary bladder varices is an unusual presentation. Bladder varices secondary to portal hypertension is rare since the bladder wall is not the usual collateral route for venous splanchnic blood flow. Bladder varices may occur in patients with portal hypertension in circumstances where the normal splanchnic collaterals fail to develop due to prior obliteration from treatments such as surgery, sclerotherapy or ligation. The second probability is when the anatomy of the venous drainage of the bladder is altered from surgery such as bladder augmentation with a bowel segment. Conclusion: Histoacryl® injection therapy can be regarded as an effective alternative in the management of patient with bleeding bladder varices.

Keywords: Hematuria, Bladder varices, Histoacryl
INTRODUCTION

Macroscopic hematuria is a common presentation to the Emergency Department (ED). Nevertheless, hematuria secondary to urinary bladder varices is an unusual presentation. Bladder varices secondary to portal hypertension are rare since the bladder wall is not the usual collateral route for venous splanchnic blood flow. Bladder varices may occur in patients with portal hypertension in circumstances where the normal splanchnic collaterals fail to develop due to prior obliteration from treatments such as surgery, sclerotherapy or ligation [1]. The second probability is when the anatomy of the venous drainage of the bladder is altered from surgery such as bladder augmentation with a bowel segment.

This case report involves a female patient who presented to the ED with bleeding bladder varices secondary to portal hypertension in an ileal augmented bladder. The report describes an alternative treatment modality to treat bleeding bladder varices using endoscopic injection of Histoacryl® (N-butyl-2-cyanoacrylate).

CASE REPORT

A 64-year-old Chinese woman presented to the ED with recurrent episodes of macroscopic hematuria. She had multiple admissions for similar complaints to other hospitals where she had been treated with blood transfusions and saline bladder irrigation.

In 1987, she had tuberculosis which resulted in kyphoscoliosis, restrictive lung disease, damaged left kidney and a contracted bladder. She also contracted hepatitis C later in life and subsequently developed liver cirrhosis.

She underwent a series of operations which included a left nephrectomy and an ileocystoplasty (to improve her bladder capacity) in 1987. A further revision of the augmented bladder was performed in 2004 for recurrent hematuria. This operation was carried out at another hospital and we are unclear of the intraoperative findings.

On arrival to our ED, she was initially treated with saline bladder irrigation and blood transfusion. In view of her history of recurrent hematuria a contrast enhanced computed tomography (CECT) scan of the abdomen and pelvis was done during this admission (Figure 1A, B).

It showed dilated blood vessels along the bladder wall, probably secondary to portosystemic shunting in the ileal segment of the augmented bladder. The shunting was secondary to hepatitis related liver cirrhosis. Additional varices were also found in the perigastric and splenic region further supporting the evidence for on-going portal hypertension.

The initial attempt to treat her with a non-selective beta-blocker resulted in a slight reduction of hematuria. Due to recurrent episodic bleeding, vascular embolization through interventional radiology was attempted but failed. She was not a good candidate for surgery due to her underlying co-morbidities.

A plan to inject Histoacryl® into the bladder varices in a similar manner to endoscopic treatment of esophageal/gastric fundal varices was devised. The cystoscopy and injection was performed using a 9 mm gastroscope (Olympus GIF XTQ60) after urethral dilatation. Using the scope and a flexible injector (21-Gauge), the varices were injected with 1 ml of Histoacryl® (Figure 1C) at each of the pre-selected sites. In this case, sites of injection were selected based on our high suspicion of areas which might have varices, supported by CT scan of abdomen and pelvis showing the extent of bladder varices and endoscopic findings of the bladder. The injection was followed with saline flush to prevent clogging of the injection catheter. Following these variceal injections, her hematuria settled and resolved (Figure 1D). Her clinical condition also improved.

DISCUSSION

Microscopic hematuria caused by bladder varices is rare. One of the cases which have been reported was a 48-year-old man with alcoholic cirrhosis, urogenital tuberculosis and augmentation ileocystoplasty treated in Scotland in the year 2000 [2]. This patient was initially treated with embolization which was then followed by open surgery and under-running of varices. Varices secondary to portal hypertension have been known to occur in ectopic areas like duodenum, jejunum, ileum and anorectal regions [3]. Varices occurring in the gastro-intestinal tract have been treated before with Histoacryl® [4, 5].

Histoacryl® achieves hemostasis through polymerization of the liquid glue into a plastic cast within the lumen of the injected vessel. This process occurs rapidly independent of the patient’s own coagulation cascade. Several weeks after successful injection, the varix undergoes necrosis and extrudes this plug from the luminal tract.

In this particular case, various options were considered before opting for Histoacryl®. Based on the experience (unpublished data) of the team managing the patient, the patient was initially treated with beta blockers. This served to reduce the severity and frequency of bleeding but the bleeding recurred. An attempt to embolize the vessels was also made during this admission, but due to the anatomical distortion of the vessels and the patient’s pre-morbid condition the procedure was abandoned. Open surgery was not considered in this patient due to her frailty.

There are a few potential advantages of tissue adhesive based injection therapy in such a scenario. It is less invasive procedure when compared to open surgery or embolization and hence may be the only means of actively arresting bleeding bladder varices in a patient who unfit or unsuitable for surgery or
embolization. It can be done without anesthesia and hence suitable in those unfit for anesthesia/sedation. The procedure could safely be repeated in the event of a re-bleeding [6]. The potential disadvantages of injection therapy with tissue adhesives are systemic embolization of the polymerised plug which could lead to infarcts at distant sites or even fatality, abscess formation at the local site of injection, perforation of viscus at the site of injection, peritoneal or extraperitoneal cavity extravasation of the tissue adhesive during injection and early polymerisation leading to adherence of injector needle to varix [7].

From Emergency Physician’s perspective, in the care of patients with recurrent hematuria, the possibility of bladder varices needs to be considered especially in those with associated stigmata of portal hypertension. The treatment option of tissue adhesive based injection of varix which is classically associated with gastrointestinal varices can be considered and explored early with the surgeons especially when the conventional surgical exploration is not possible due to patient factors. The early involvement of the Emergency Physician in the decision making process could speed up the intervention vertically.

CONCLUSION

The treatment of variceal hemorrhage using
Histoacryl® injections have been described within the gastrointestinal system but this case report is a rare description of this technique in management of bleeding bladder varices. It has been proven to be effective and safe in treating gastrointestinal bleeding. Histoacryl® injection therapy similarly can also be an effective alternative in the management of patient with bleeding bladder varices.

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**Author Contributions**

Sivaprakasam Sivalingam – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

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Muhilan Parameswaran – Substantial contributions to conception and design, Acquisition of data, Analysis and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

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**Guarantor**

The corresponding author is the guarantor of submission.

**Conflict of Interest**

Authors declare no conflict of interest.

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**REFERENCES**