

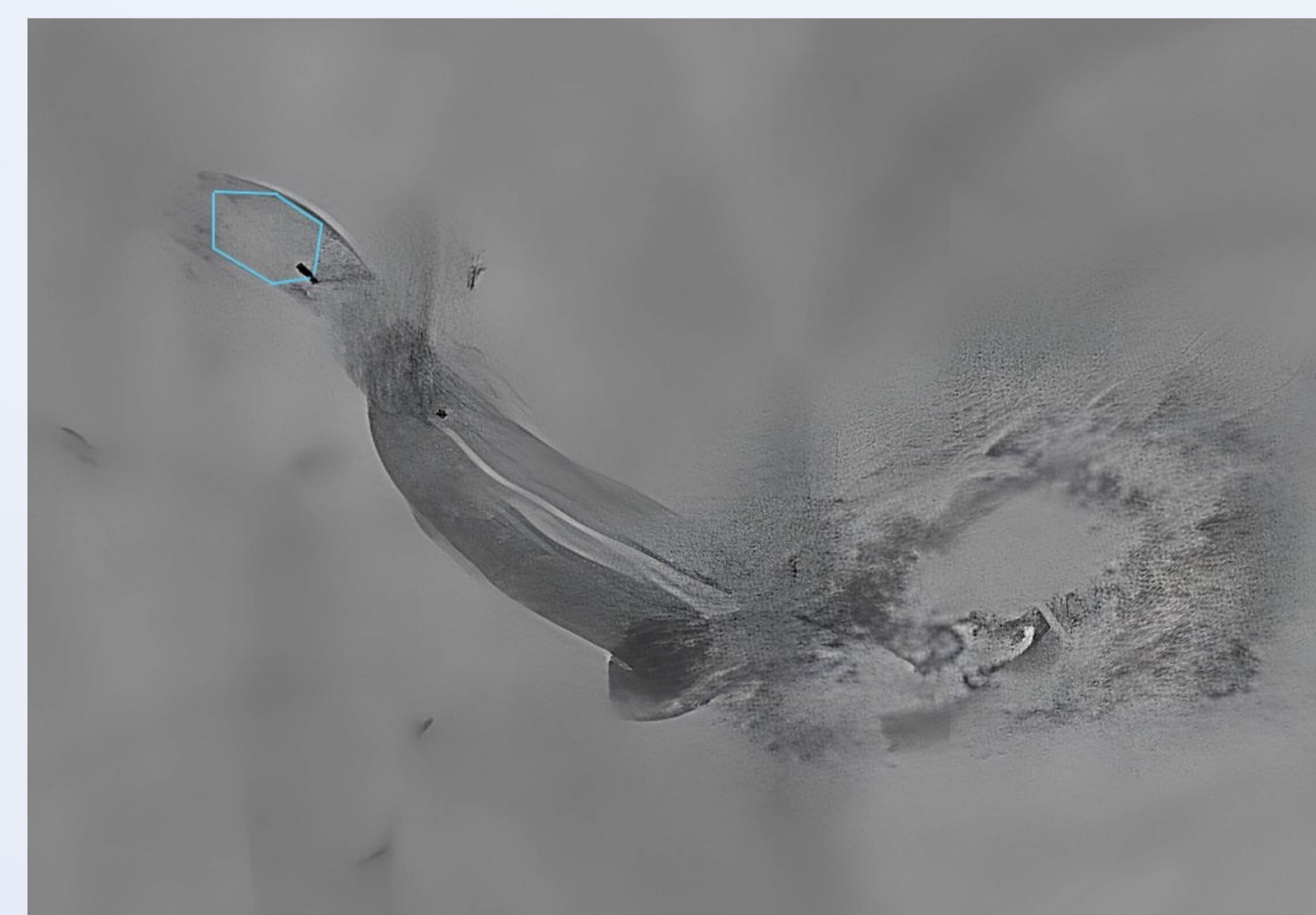
## INTRODUCTION

- Stomal and rectal varices are rarer complications of portal hypertension that can cause recurrent bleeding.
- Stomal varix is characterized as a type of ectopic varix. Ectopic variceal bleeding accounts for 1-5% of all variceal bleeding, and of this 1-5%, 26% involves stomal varices.<sup>1</sup>
- Transjugular intrahepatic portosystemic shunt (TIPS) creation is often the best treatment for underlying problems of portal hypertension, but some patients are poor candidates for TIPS creation.
- Current approaches to intervening include balloon-occluded retrograde transvenous obliteration (BRTO) and ultrasound-guided percutaneous sclerotherapy.<sup>2,3</sup>
- The MVP microvascular plug system (Medtronic Inc.) has a cage design of nitinol covered by a polytetrafluoroethylene (PTFE) membrane, allowing for a mechanical occlusion of bleeding varices without relying exclusively on thrombosis to achieve hemostasis.
- The plug system deployment also does not require balloon occlusion or an additional microcatheter. It can also be re-sheathed if repositioning is necessary.
- **AIM: To evaluate the clinical safety and effectiveness of using the MVP microvascular plug system (Medtronic Inc.) and sodium tetradecyl sulfate (STS) foam-assisted antegrade transvenous obliteration (PATO) for the treatment of bleeding rectal and stomal varices (RV, SV).**

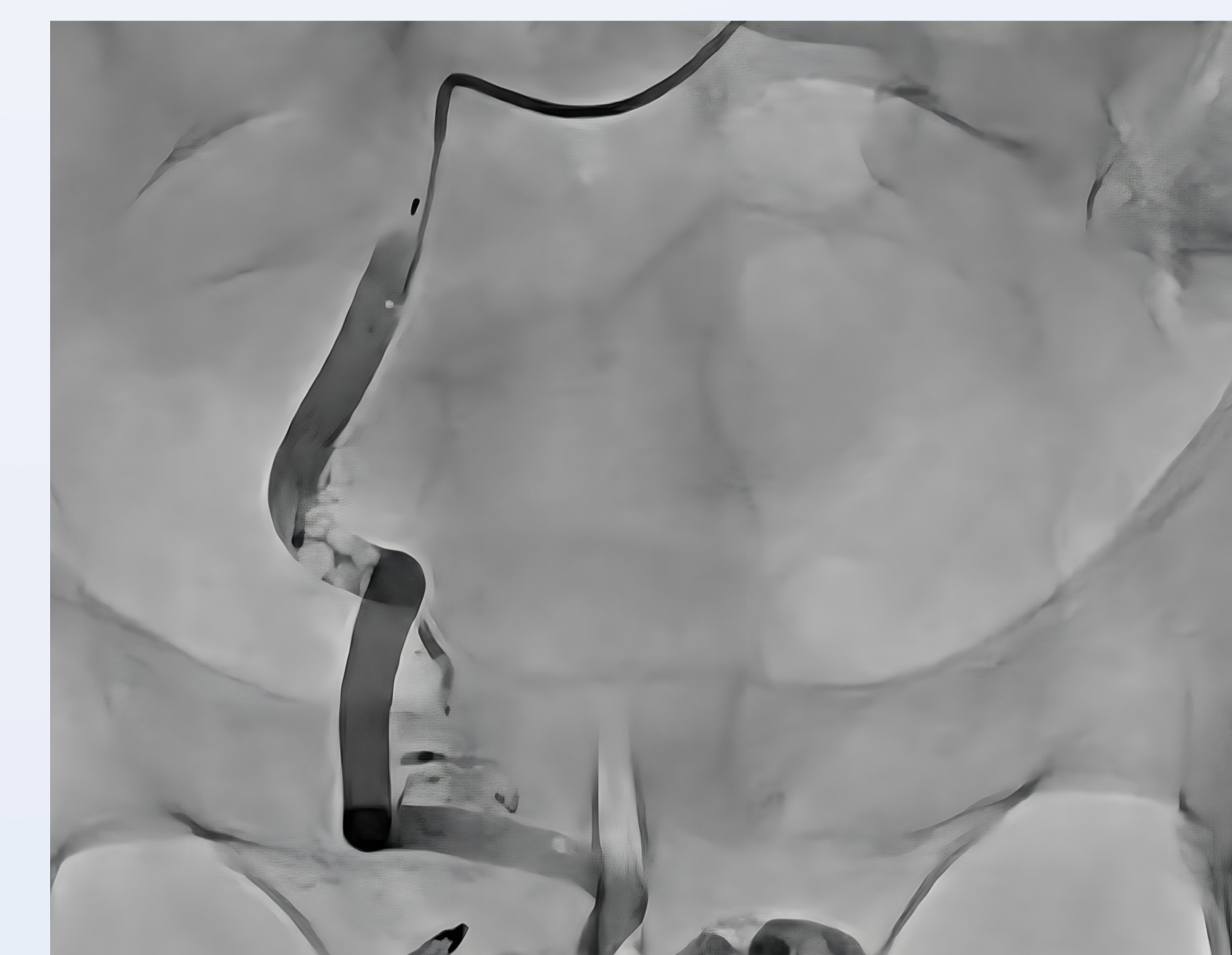
## METHODS

- From January to December 2021, **5 patients** (mean age 55.8 years, range 10-76, 20% female) underwent plug-assisted transvenous obliteration (PATO) the MVP microvascular plug system (Medtronic Inc.) at a single academic center.
- **Location of bleed:** 3 patients had rectal variceal bleeding, and 3 patients had stomal variceal bleeding.
- **Average pre-procedural MELD:** 14
- **Glue Ratio:** Embolization was performed using 1:3 to 1:5 mixtures of NBCA and iodized oil.
- Technical success (TS), rate of early recurrent bleeding, and adverse events (AEs) were recorded.
- Technical success was defined as the disappearance of angiographic findings of hemorrhage.

## RESULTS



**Figure 1. Stomal varix case**  
Above: CT angiogram venous phase showing varix pre-embolization.  
Below: Fluoroscopic image of MVP microvascular plug, outlined in blue, with black radiographic marker seen. Varix can be visualized distally.



**Figure 1. Rectal varix case**  
Above: CT angiogram venous phase showing rectal varices pre-embolization.  
Below: Fluoroscopic image of MVP microvascular plug, with bubbles of STS foam visualized with contrast in the background. The distal radiographic marker of the plug can be seen just distal to the top of the microcatheter.

## RESULTS

- **Technical success rate: 100%**
- **Rate of target site rebleed: 0%**
- **Adverse event rate: 0%**
- The average fluoroscopy time was 10.78 minutes, with a median of 7 minutes.
- One statistical outlier for fluoroscopy time was performed as an adjunct to a TIPS, with 25.9 minutes of fluoroscopy time.
- All cases were completed using one MVP-5Q plug allowing the procedure to be conducted entirely through a single 4F diagnostic catheter.
- No occlusion balloons were used, and trapping a second microcatheter to complete the procedure was not required.

## DISCUSSION

- We examined technical success and safety of an MVP microvascular plug system (Medtronic Inc.) and sodium tetradecyl sulfate (STS) foam-assisted antegrade transvenous obliteration (PATO) for the treatment of bleeding rectal and stomal varices (RV, SV)
- Study limitations: retrospective single center study design, short follow up period, limited number of patients
- Future directions: Increased sample size, longer follow up periods, and comparison to other embolization types will help to delineate the long-term safety profile and define the patient population for which the MVP microvascular plug system is the most appropriate method of embolization.
- **CONCLUSION: Microvascular plug-assisted STS foam sclerosis is a safe and clinically effective for treatment of rectal and stomal variceal bleeding. This technique allows for complete sclerosis of varices using a single plug without the need for balloon occlusion or trapping of a second microcatheter.**

## REFERENCES

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2. Ozaki, M., Jogo, A., Yamamoto, A., Kaminou, T., Hamuro, M., Sohagawa, E., ... & Miki, Y. (2021). Transcatheter embolization for stomal varices: A report of three patients. *Radiology Case Reports*, 16(4), 801-806.
3. Zhang, Z., Chen, X., Li, C., Feng, H., Yu, H., Zhu, R., & Wang, T. (2019). Safety and efficacy of a novel shunt surgery combined with foam sclerotherapy of varices for prehepatic portal hypertension: a pilot study. *Clinics*, 74.