

A Quality Improvement Initiative Results in Improved Rates of Timely Postvariceal Bleeding Surveillance Endoscopy

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- OBJECTIVES:** We performed a study to assess the effects of a quality improvement (QI) initiative on the rates of postvariceal bleeding surveillance upper endoscopy (EGD).
- METHODS:** We identified patients with cirrhosis hospitalized with variceal bleeding and assessed the rates of timely (≤ 4 weeks) EGD before and after a QI initiative.
- RESULTS:** Preintervention: 16% (5 of 32) of patients underwent timely surveillance EGD. We developed a standardized ordering template for gastroenterology fellows and reserved postvariceal EGD scheduling slots. Postintervention: 43% (12 of 28) of patients underwent timely surveillance EGD.
- DISCUSSION:** A QI intervention was associated with a 27% absolute increase in timely surveillance EGDs.

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INTRODUCTION

Esophageal variceal bleeding is a common complication of cirrhosis associated with high mortality (1). Use of nonselective beta-blockers and endoscopic variceal ligation (EVL) after an episode of bleeding decreases rebleeding and mortality (2). As a result, major gastroenterology and hepatology societies recommend repeat upper endoscopy (EGD) with EVL at 2–4 week intervals until obliteration of varices (2,3). Unfortunately, studies demonstrate that patients often fail to receive recommended secondary prophylaxis after an initial variceal bleeding episode (4–6) and there are few published quality improvement (QI) efforts aimed at addressing this issue (7).

Therefore, we aimed to design and assess a QI intervention at a tertiary care center to improve the receipt of timely surveillance endoscopy among patients with cirrhosis admitted with bleeding esophageal varices.

METHODS

We included patients with cirrhosis hospitalized at the University of North Carolina (UNC) for esophageal variceal bleeding. Exclusion criteria included death during hospitalization, discharge to hospice, transjugular intrahepatic portosystemic shunt (TIPS) placement or liver transplantation during the 4 weeks after the variceal bleed, or patient decision to receive surveillance EGD at outside facility.

The primary outcome was receipt of timely surveillance EGD, defined as receipt of upper endoscopy 1–4 weeks from initial EGD, in accordance with the American Association for the Liver

Diseases (AASLD) guidelines (2). For those who did not receive timely endoscopy, we identified the reason(s) including failure to place an EGD order, failure to schedule an EGD, scheduling the EGD >4 weeks from index bleed, and cancellations/no-shows. The study had a preimplementation control period from July 2017 through June 2018 and postimplementation study period from December 2018 through November 2019, including 2 unique cohorts.

Based on data from the control period, we developed a fishbone diagram (Figure 1) and subsequent QI intervention that included a standardized ordering process for surveillance EGDs and 2 reserved postvariceal bleed EGD procedure visits per week. The intervention was presented at a gastroenterology and hepatology division conference and was distributed via a division-wide email to all faculty and fellows. The ordering process and the importance of timely scheduling was also reviewed with the GI procedures scheduling office.

The UNC Institutional Review Board (IRB) determined that this QI study did not require IRB approval because it did not constitute human subjects research as defined by federal regulations.

RESULTS

Preintervention data

During the control period, 32 patients were eligible for inclusion, of whom 5 (16%) underwent timely surveillance (Figure 2). In the preintervention period, the median time to EGD after discharge was 41 days (IQR 29–77), including 23 days (IQR 21–25) in those

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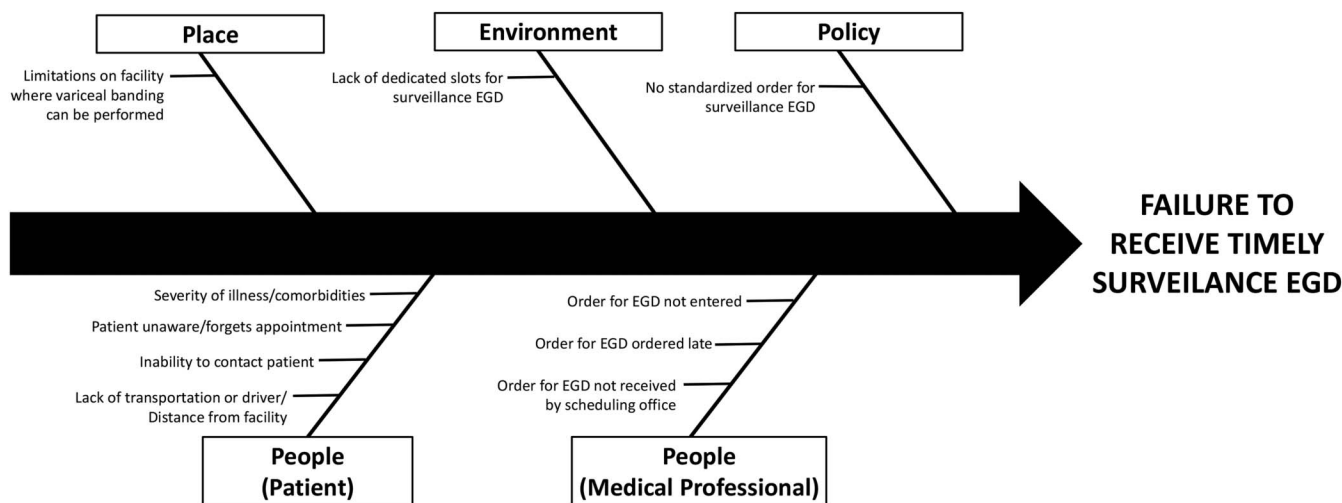


Figure 1. Fishbone diagram outlining potential causes of low rates of postvariceal bleeding surveillance EGDs. The diagram outlines the potential contributing causes for failure of patients to receive timely postvariceal bleed surveillance EGD. Each potential contributing cause is organized within categories including the environment, place, policy, and people (patient and medical professional). Potential procedure and equipment issues were explored, but none were identified as proximate causes.

with timely EGDs and 46 days (IQR 36–97) in those without timely EGDs. The most common reason for failure to receive timely surveillance EGD was the EGD being scheduled for a date >4 weeks after the index bleed (74%).

QI intervention

We determined that the most common reason for failure to schedule surveillance EGD within 4 weeks of the index bleed was because of a lack of availability of procedure slots in the outpatient endoscopy schedule, particularly with hepatology providers. Thus, our primary QI intervention was the creation of 2 outpatient postvariceal bleed EGD procedure visits per week reserved for hepatologists. A second component of the QI intervention was to standardize the ordering process for surveillance EGDs, including a templated order to be placed by the hepatology consult fellow before the patient's hospital discharge. As part of this intervention, all UNC gastroenterology fellows were emailed twice and instructed to use specific language in the order comment section specifying the required date range of the surveillance EGD and the use of the designated postvariceal bleeding scheduling slots.

Postintervention data

Of the 28 patients included in the postintervention analysis, 12 (43%) underwent timely surveillance EGD (Figure 2). In the postintervention period, the median time to EGD after discharge was 22 days (IQR 17–37), including 17 days (IQR 14–21) in those with timely EGDs and 43 days (IQR 34–61) in those without timely EGDs. Reasons for failure to undergo timely surveillance EGD were scheduling the EGD >4 weeks after the index bleed (56%) and cancellations (31%) and a lack of placing an EGD order (13%).

DISCUSSION

Surveillance endoscopy with EVL is important for secondary prophylaxis of variceal bleeding. In this QI project, the development of postvariceal bleed EGD procedure slots and standardization of the ordering protocol resulted in a 27% absolute

increase in the proportion of patients receiving timely surveillance EGD. However, a substantial proportion of patients in the postintervention period still had their surveillance EGD performed >4 weeks after the index bleed. Several of these patients canceled their procedures or had EGDs ordered ≥ 4 weeks after the index bleed, and there were 5 instances in which an EGD order was placed in a timely and appropriate fashion and surveillance EGD was scheduled late. This suggests that the educational component of the QI intervention involving the EGD order template had limited effect. Despite the persistently low postintervention receipt of timely EGDs, the relative distributions of EGD timing among those with nontimely EGDs in the preintervention (IQR 36–97) and postintervention (IQR 34–61) cohort suggest our intervention may have had effects not fully captured by our primary outcome measure.

Our findings expand on previously published work. A QI intervention in Australia resulted in a dramatic and sustained improvement in variceal eradication rates after hiring of a dedicated nurse to coordinate patient follow-up after variceal bleeding (8). Furthermore, a recent study in a Veterans Affairs endoscopy unit identified interventions focused on improving patient education and streamlining the process of canceling and rescheduling procedures as the most effective at decreasing no-shows and late cancellations (9). These studies in combination with our findings suggest that QI efforts must extend beyond educational interventions alone to be effective.

There are several potential future directions for improving timely surveillance EGD rates. This QI intervention was entirely clinician-focused, and future efforts could intervene on patient-related issues including patient education on the importance of surveillance EGD, transportation issues, or social issues that may adversely affect the ability to follow-up. Changes in the US healthcare system, including increased hospital consolidation and near-universal use of the electronic health record, may provide opportunities for improving the rates of timely surveillance endoscopy. Distance from tertiary care centers and transportation issues could contribute to nonreceipt of surveillance endoscopy. Enlarging healthcare networks may allow patients to

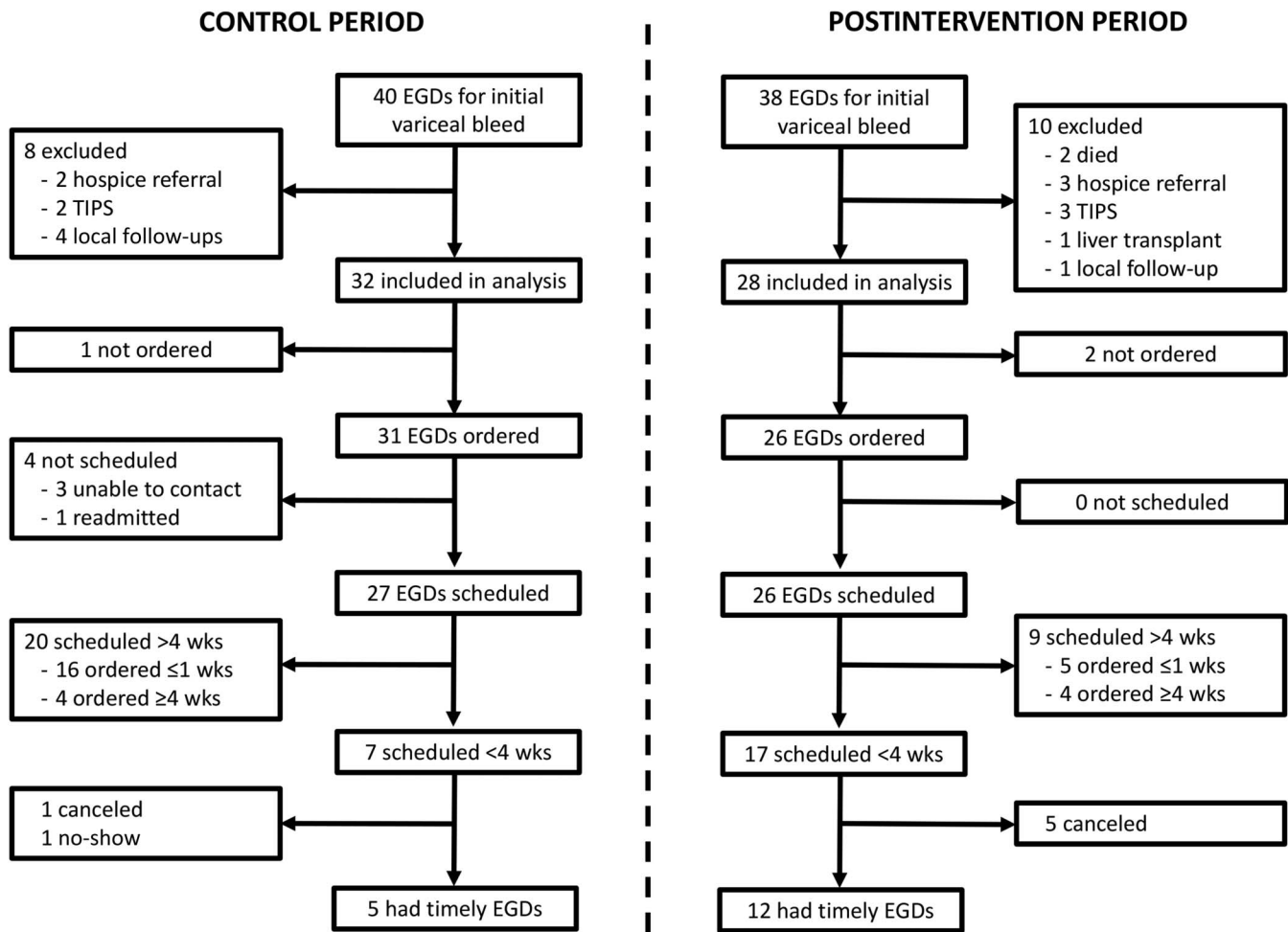


Figure 2. Flow chart of the provision of surveillance EGD among patients hospitalized for variceal bleeding in the control and postintervention periods. In the control period, 40 patients were considered for analysis and, after exclusions, 32 were included in the analysis. Owing to failure to order or schedule EGD, late scheduling, cancellations, and no-shows, 27 did not receive timely EGDs. In the postintervention period, 38 patients were considered and 28 were included in the analysis. Overall, 16 of 28 patients did not receive timely EGDs because they were not ordered, scheduled late, or canceled.

schedule surveillance EGDs closer to home (10). In addition, reminders through the electronic health record could be used to improve ordering and scheduling of procedures, as has been successfully done for hepatocellular carcinoma screening (11,12).

In conclusion, after using a QI project including fellow education and flexible scheduling dedicated to variceal surveillance, the rates of timely surveillance endoscopy improved and surpassed our goal of a 20% absolute increase in rates. Future efforts could be made to leverage hospital system networks and electronic reminders within the electronic health record to further improve surveillance EGD rates.

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CONFLICTS OF INTEREST

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