Impact of a Collaborative Small Bowel Obstruction Imaging and Care Protocol with the General Surgery Service on Radiology Workflow and Resource Utilization

Kaitlin M. Zaki-Metias, MD[1] | Mark Glover, DO[2] | Trevena Metias, BSc[3] | Nathaniel Sertu, BSc[3] | Amy Braddock, MD[2] | Bashir H. Hakim, MD[1,4] | Stephen M. Seedial, MD, RPVI[1,4]

[1] Department of Radiology, Trinity Health Oakland Hospital/Wayne State University School of Medicine, Pontiac, MI; [2] Department of Surgery, Trinity Health Oakland Hospital/Wayne State University School of Medicine, Pontiac, MI; [3] Ross University School of Medicine, Bridgetown, Barbados; [4] Huron Valley Radiology, Ypsilanti, MI

Introduction

Small bowel obstruction (SBO) is a common cause of diagnostic imaging, hospital admission, and surgical consultation. A new institutional SBO care protocol was created by the general surgery service in collaboration with the radiology department.

Patients with suspected SBO often undergo initial CT imaging without oral contrast. Prior to the new protocol, it was usual for a second CT with oral contrast to be performed to confirm the diagnosis of SBO and guide further management. The new protocol eliminates the second CT, using oral Gastrografin® and serial abdominal radiographs for further assessment in clinically stable patients.

The purpose of this study is to assess the impact of this protocol on the radiology department's workflow and resource utilization.

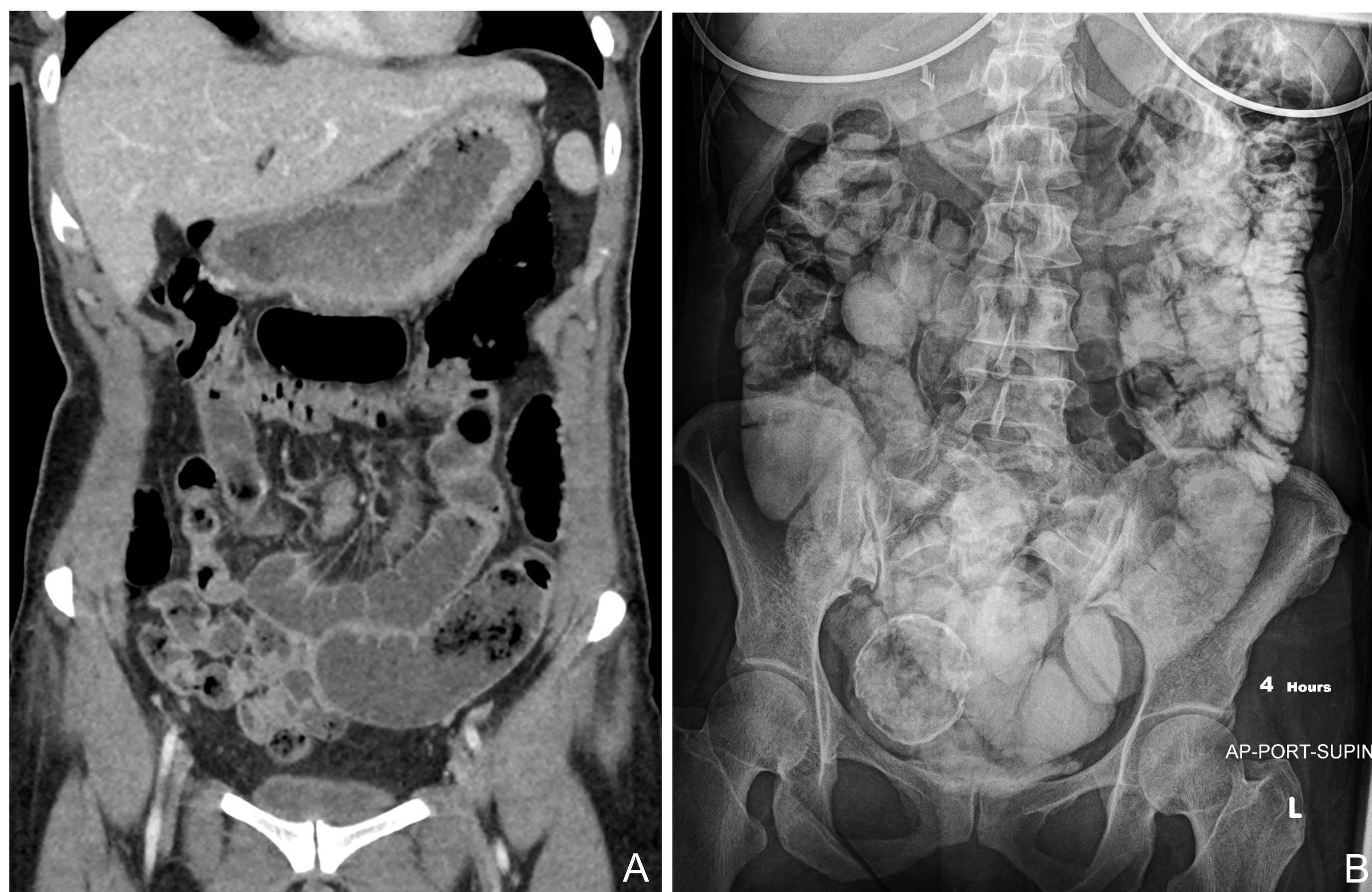


Figure 1. CT of the abdomen and pelvis without oral contrast (A) shows dilated fluid-filled small bowel loops in the left lower abdomen consistent with SBO. Frontal abdominal radiograph 4 hours after the administration of water-soluble contrast shows persistent mild small bowel dilatation with passage of contrast into the colon, excluding high-grade obstruction.

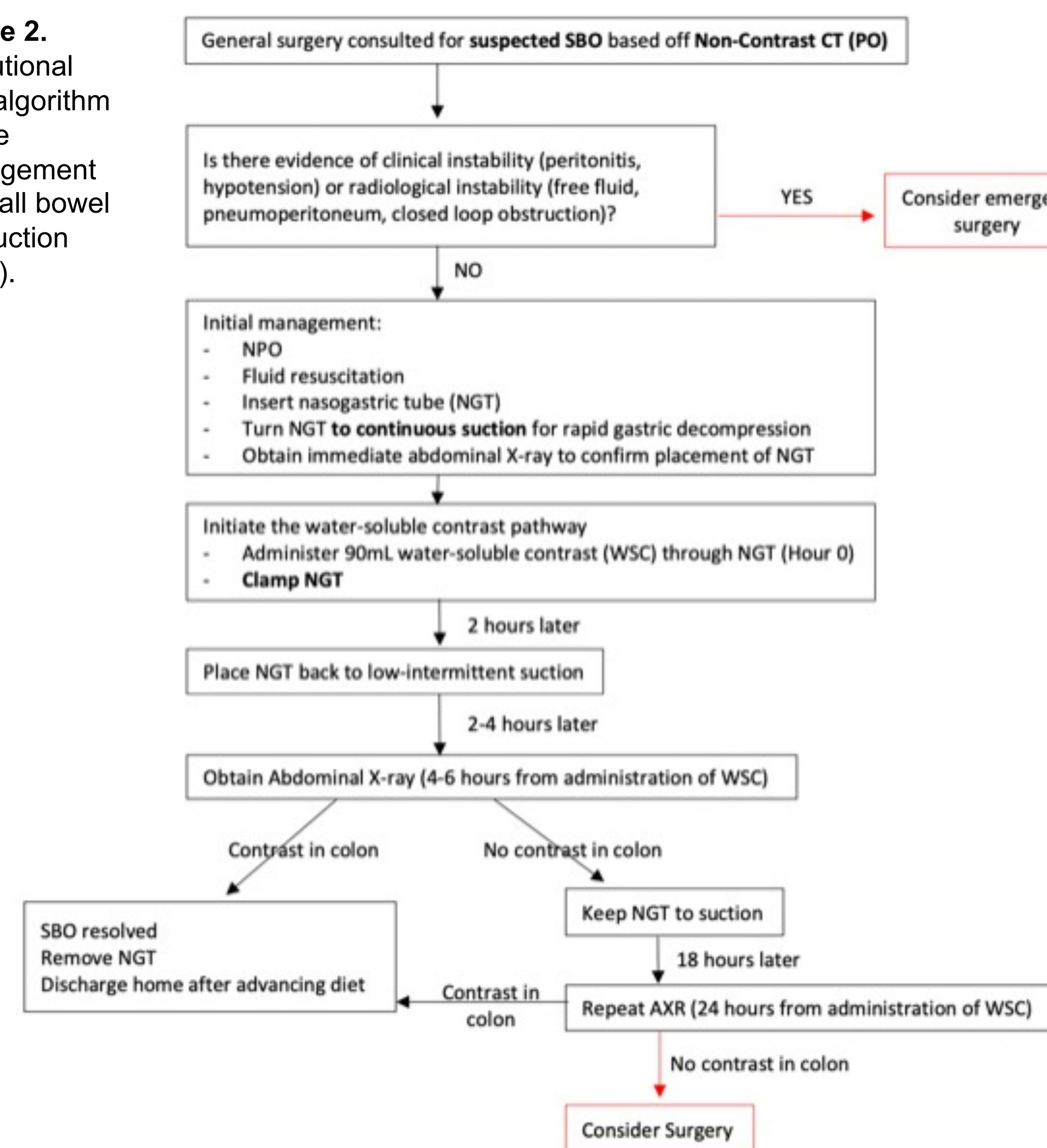
Methods

Study design: single-institution retrospective cohort study was conducted on patients from the emergency department with SBO as diagnosed initial abdominopelvic CT and for whom the general surgery service was consulted.

Control group: Patients who underwent two consecutive abdominopelvic CT scans for SBO within 24 hours, one with oral contrast and one without, prior to implementation of the new protocol.

Outcomes assessed: Ionizing radiation exposure, contrast media utilization, and CT scanner and technologist time, were recorded for both groups.

Figure 2. Institutional care algorithm for the management of small bowel obstruction (SBO).

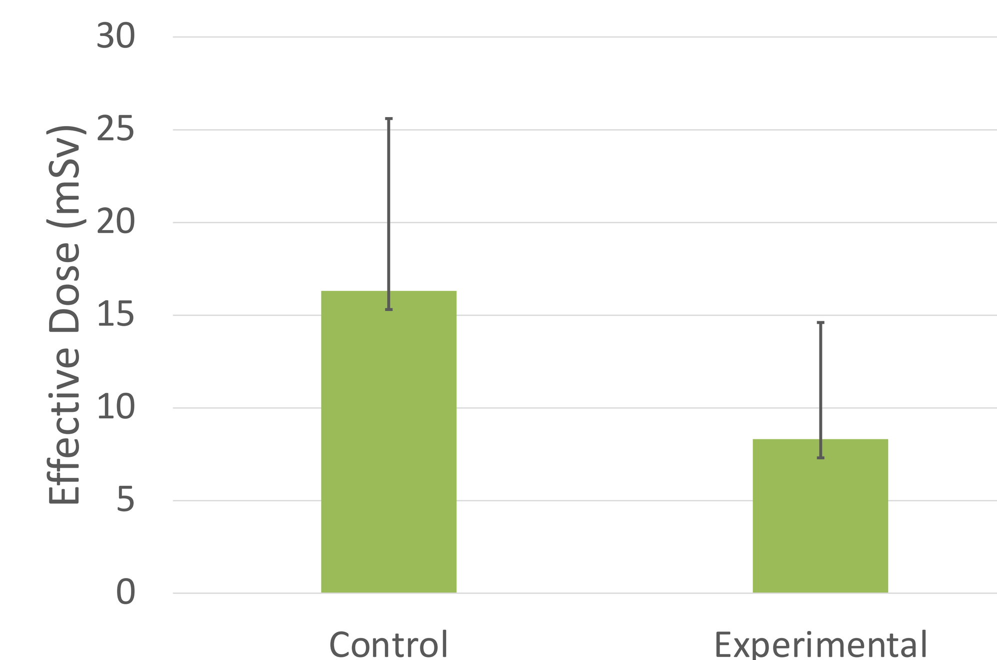


Results

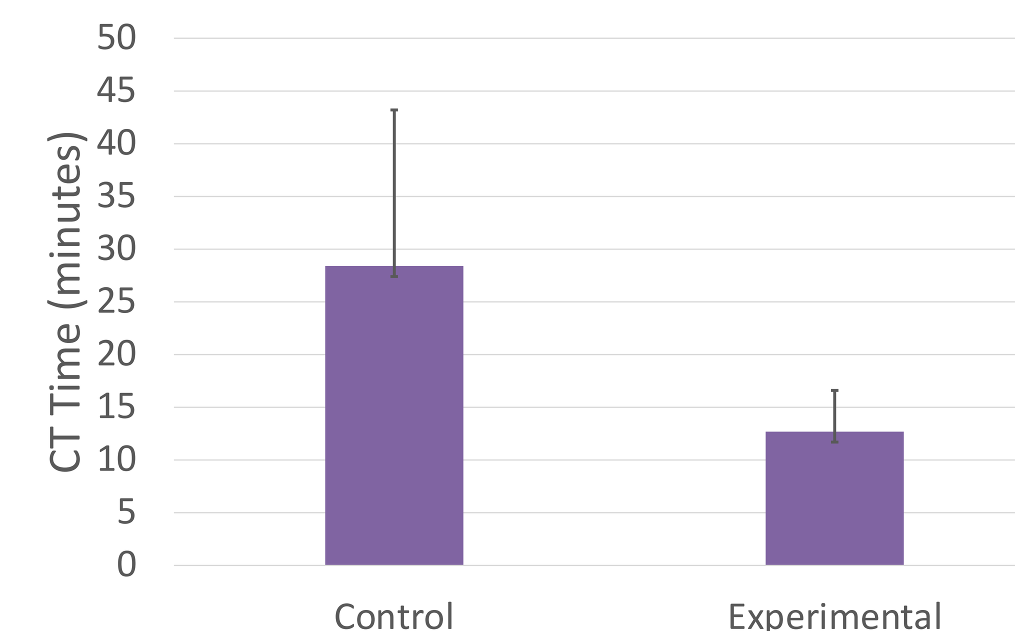
Experimental group: 18 patients

Control group: 38 patients

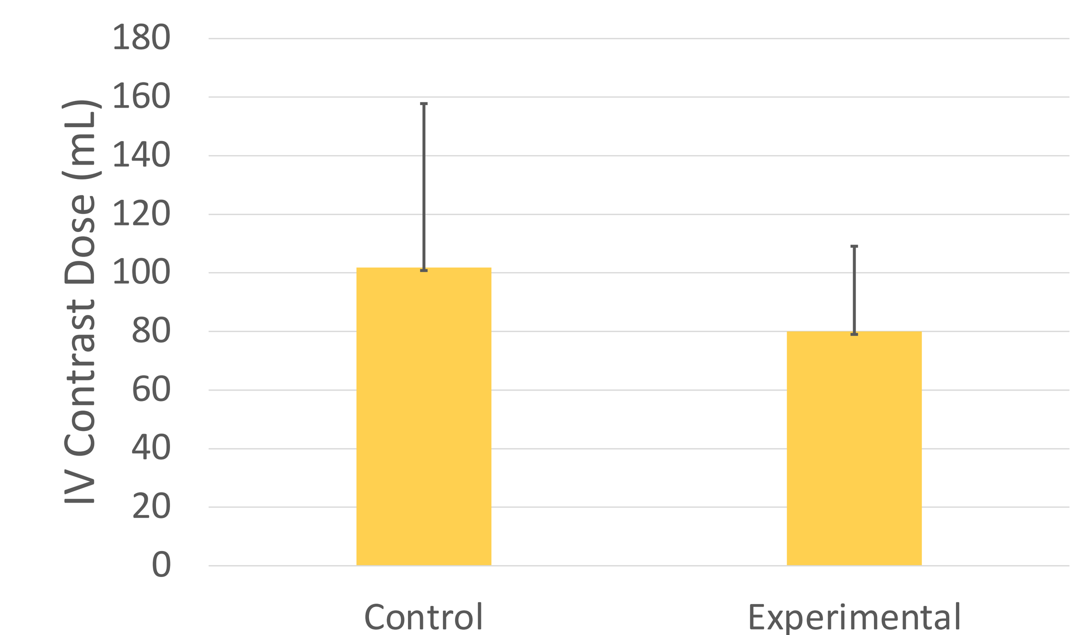
Total effective dose (mSv) was significantly less in the experimental group (mean 8.3 mSv ± 6.3 mSv) relative to the control group (mean 16.3 mSv ± 9.3 mSv) ($p=0.02$).



Total CT scanner and technologist time was significantly less in the experimental group (mean 12.7 minutes ± 3.9) relative to the control group (mean 28.4 minutes ± 14.8) ($p<0.001$).



There was a trend for less use of intravenous contrast media in the experimental group relative to the control group, however, this was not statistically significant ($p=0.06$).



Operative versus nonoperative management and length of stay were not significantly different between the two groups ($p=1.0$ and $p=0.517$, respectively).

Conclusion

The implementation of a collaborative SBO imaging and care algorithm between the general surgery service and radiology resulted in reduced effective dose to patients and decreased CT scanner and technologist time, although patient outcomes and length of stay were not significantly different.

References

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WAYNE STATE
School of Medicine