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Early healing of transcolonic and transgastric natural orifice transluminal endoscopic surgery access sites.

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Abstract

BACKGROUND: Natural Orifice Transluminal Endoscopic Surgery (NOTES) is a developing, minimally invasive surgical approach whose potential benefits are being investigated. Little is known about secure access site closure and early healing kinetics of transvisceral access. STUDY DESIGN: Transvisceral access incisions were created in the colon (C-NOTES, n = 8) and stomach (G-NOTES, n = 8) for peritoneal exploration. Incisions were closed primarily with endoloops, endoclips, or t-tags. Macroscopic and histologic analyses performed on postoperative day 7 assessed gross appearance, granulation tissue, inflammation, ulceration, and complications. RESULTS: Macroscopically, incisions appeared closed without intraperitoneal spillage. Incisions closed by endoloop and t-tags showed intense granulation tissue fill of defect despite partial (G-NOTES, n = 3) and transmural ulceration (C-NOTES, n = 8; G-NOTES, n = 3). Of the 30 t-tags applied, 40% broke or deployed into the peritoneal cavity. Endoclip closures (C-NOTES, n = 1; G-NOTES, n = 1) did not show histologic mucosal continuity. Healing complications included transmural necrosis (C-NOTES, n = 1; G-NOTES, n = 1), foreign body material (C-NOTES, n = 3; G-NOTES, n = 2), and microabscesses (G-NOTES, n = 1). CONCLUSIONS: This study provides a reproducible model to assess noninvasive repair of planned visceral perforations. Of investigated technologies, endoloop closure was favored for transcolonic incisions, and t-tags with omental patch for transgastric incisions, although these have significant limitations. Endoclips were inadequate for primary closure, but may be useful as an adjunctive closure modality. Additional studies are needed to examine visceral repair at later time points, as they will help determine the quality and kinetics of repair of a variety of incision closure strategies. This study demonstrates the need for improved technologies to more reliably close

visceral transluminal defects.

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