



Pediatric endoscopic injuries: incidence, management, and outcomes

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Abstract

Background: Endoscopy has assumed a significant role in the management of gastrointestinal disorders. However, endoscopic-related injuries are poorly reported.

Methods: Review of our surgical database (1980–2006) identified all patients age 18 years or younger with an endoscopic-related injury managed at our institution.

Results: A total of 3269 colonoscopies were performed; there were 3 iatrogenic perforations (incidence, 0.09%). All were managed operatively: 2 underwent fecal diversion, and 1 was repaired primarily. There was 1 postoperative complication (internal hernia) and no deaths related to colonoscopic perforation. Nine thousand three hundred eight esophagogastroduodenoscopy (EGD) procedures were performed, resulting in 6 iatrogenic injuries (0.06%): bleeding (2), perforation (2), and mucosal tears (2) (0.02% each). All EGD-related injuries occurred in the esophagus except for 1 duodenal perforation which was managed operatively by primary repair. Both patients with bleeding complications underwent repeat endoscopy and cautery with satisfactory results. The other 3 patients were managed conservatively without complication. Three hundred eighty-nine endoscopic retrograde cholangiopancreatogram procedures were performed with 2 iatrogenic injuries (0.5%): 1 bleed and 1 perforation (0.25% each). Both were managed conservatively without complication.

Conclusion: Endoscopic injuries are uncommon. Colonoscopic perforations require prompt surgical intervention. Esophagogastroduodenoscopy- and endoscopic retrograde cholangiopancreatogram-related injuries are amenable to conservative therapy in clinically stable patients devoid of peritonitis. © 2008 Elsevier Inc. All rights reserved.

The scope of endoscopy in the diagnosis and management of pediatric gastrointestinal disorders continues to broaden and will continue to expand as novel, less invasive endoscopic tools continue to emerge [1–6]. The expansion

in the use of endoscopy will inevitably lead to a corresponding increase in volume of endoscopic procedures and will inevitably make endoscopic-related complications more commonplace.

This trend has already occurred within the adult population where endoscopic injuries are associated with significant morbidity and mortality [7–10]. Even less is known regarding pediatric endoscopy where studies regarding endoscopic-related complications have focused on

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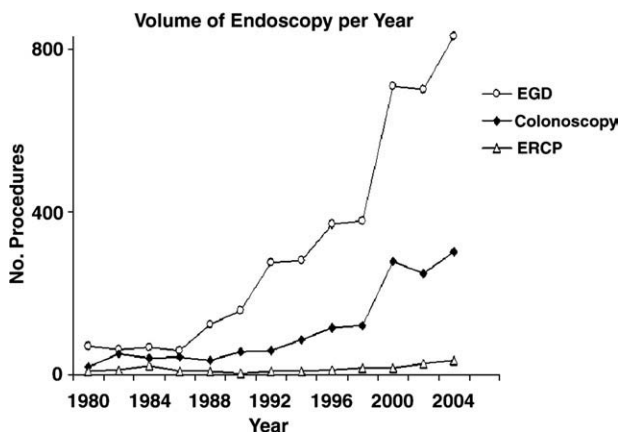


Fig. 1 Volume of EGD, colonoscopy, and ERCP per year since 1980.

physician- or patient-reported adverse events, as opposed to a thorough investigation of serious endoscopic-related injuries such as perforation and bleeding [11,12]. We present our single institutional experience with endoscopic-related injuries.

1. Methods

After institutional review board approval, we searched our surgical database for all patients 0 to 18 years old having either a colonoscopy, esophagogastroduodenoscopy (EGD), or an endoscopic retrograde cholangiopancreatogram (ERCP) from 1980 to 2006. Of these patients, we identified those who had also sustained an endoscopic-related injury (perforation, mucosal tear, and/or bleeding) and reviewed their charts for data regarding indication for endoscopic procedure, procedural characteristics, presentation of endoscopic injury, management of injuries, and overall outcomes.

2. Results

2.1. Colonoscopy

A total of 3269 colonoscopies were performed by both pediatric surgeons and pediatric gastroenterologists between

1980 and 2006. From 1980 until 2001, there was a steady increase in the number of colonoscopies performed annually; however, over the last 6 years, this trend has leveled off to an average of 272 (range, 243-338) colonoscopies per year (Fig. 1). There were 3 iatrogenic injuries, all colonoscopic perforations, for an incidence of 0.09%. Two of the patients (both female, ages 17 and 13 years) had preexisting chronic ulcerative colitis and were undergoing colonoscopic evaluation of acute colitis; 1 patient was on prednisone. The third child, a 6-month-old male infant, underwent diagnostic colonoscopy with biopsy to rule out a protein losing enteropathy as a source for failure to thrive. Only 1 patient was noted to have an inadequate bowel prep making the examination difficult. Two patients (including the one with an inadequate prep) had biopsies taken during the procedure, and the third patient had an examination-only procedure.

All 3 perforations presented and were diagnosed within 24 hours of the index procedure, including a single perforation that was recognized at the time of the initial procedure. The other patients presented with abdominal distention 4 hours post procedure in one and abdominal pain within 24 hours in the other. All 3 patients had a flat and upright abdominal radiograph, of which 2 were positive. White blood count was elevated in 2 of the 3 patients.

All 3 patients were managed operatively: 2 with a fecal diversion procedure and 1 undergoing primary repair of the perforation. Both patients receiving fecal diversion procedures had preexisting chronic ulcerative colitis and underwent total colectomy with ileostomy as part of a more definitive treatment for their underlying gastrointestinal disorders; each was eventually reversed. Moderate peritoneal contamination was observed in all 3 patients by the operating surgeon. Two of the perforations were owing to direct, blunt injury from the colonoscope: 1 in the transverse colon and 1 in the sigmoid colon. The third perforation occurred at a biopsy site in the transverse colon.

There was one postoperative complication, an internal hernia which required reoperation. There were no perioperative deaths. The mean duration of hospitalization was 16 days (range, 8-30 days).

2.2. Esophagogastroduodenoscopy

Since 1980, 9308 EGDs have been performed, primarily by pediatric gastroenterologists, at our institution (excluding

Table 1 Indications for EGD and procedural characteristics

Patient	Sex	Age (y)	Indication	Operator Difficulty	Procedures	Complication
1	M	16	FAP	Normal	Laser ablation of polyps	Perforation
2	F	11	Esophageal stricture	Normal	Balloon dilatation with stenting	Perforation
3	M	17	Chest pain	Normal	Snare polypectomy	Bleeding
4	M	8	Reflux	Normal	Biopsies	Bleeding
5	M	16	Dysphagia	Difficult	Examination only	Mucosal tear
6	M	12	Dysphagia	Normal	Examination only	Mucosal tear

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