Main topic

Upper and lower gastrointestinal endoscopy in children with Crohn’s disease

D. J. S. Cameron and B. I. McLain

Department of Gastroenterology, Royal Children’s Hospital, Parkville, Victoria, 3052, Australia

Abstract: Twenty-three children and adolescents with Crohn’s disease had systematic upper and lower gastrointestinal (GI) endoscopy as part of the initial diagnostic assessment. Twenty (86%) had evidence of some involvement of the upper GI tract (oesophagus - 4, stomach - 19, duodenum - 5). In 13 children, the upper GI findings were instrumental in making the diagnosis of Crohn’s disease. The ileum was viewed in 18 and found to be abnormal in 14 (78%). The colon was affected to some extent in 16 (70%); the proximal colon was affected twice as frequently as the distal colon and rectum. Early upper and lower GI endoscopy is recommended as part of the assessment of suspected inflammatory bowel disease in children.

Key words: Crohn’s disease – Endoscopy

Introduction

The development of improved techniques and instrumentation has enabled upper and lower gastrointestinal (GI) endoscopy to be performed safely and effectively in children of all ages. In recent years it has been our routine practice to do both upper and lower GI endoscopy in all children and adolescents suspected of having inflammatory bowel disease, whether or not there have been upper GI symptoms. The results of “top and tail” endoscopy (gastroscopy and colonoscopy) performed on 23 of the 63 patients reported in the accompanying articles [1–3] are described here.

Patients and methods

The patients had both upper and lower GI endoscopy performed early in the investigation of suspected inflammatory bowel disease. Ages ranged from 10 to 15 years at the time of diagnosis; there were 14 boys and 9 girls. In earlier studies, bowel preparation was achieved by purgation, enemas, and bowel washouts, and more recently by the use of an isotonic colonic lavage solution (“Golytely”, Golytely Products) administered orally or by nasogastric tube over a 4-h period the night before the examination.

Both upper and lower endoscopies were performed with the patient under general anaesthesia during one session using Olympus paediatric endoscopes (GIFP3 or XP10, and PCF or PCF10). Biopsy specimens for light microscopy were routinely taken from macroscopically normal as well as abnormal areas in oesophagus, stomach, duodenum, ileum, and colon. There were no complications. Gastroscopic examination was technically satisfactory in all cases. At colonoscopy, the aim was to enter the terminal ileum. This was achieved in 18 of the 23 cases. In 3, severity of disease in the ileocaecal region prevented further passage of the colonoscope; in 2 the ileum was not seen because of inadequate bowel preparation.

Macroscopic abnormalities in the upper GI tract included ulceration of the mid-oesophagus and patchy changes in the gastric mucosa with reddening, induration, granularity, and fragility. Aphthoid, circular, and linear ulcers were sometimes seen. The duodenal mucosal changes were usually aphthoid ulcers or “notching” ulcers on duodenal folds.

Macroscopic changes in the lower GI tract included classical aphthoid, circular, and linear ulcers, inflammatory “pseudopolyps”, bridges, and “cobblestones” in the colon and terminal ileum, often with areas of intervening normal mucosa. Microscopic abnormalities included generalised or focal nonspecific infiltration with acute and chronic inflammatory cells (mainly lymphocytes and plasma cells) with or without characteristic granulomas and giant cells.

Results

The upper GI tract was involved to some extent in 20 of 23 patients (Table 1). Seven had no macroscopic abnormalities, but 4 of these had microscopic abnormalities in biopsies from apparently normal areas. Twelve of the 20 had upper GI symptoms. In the stomach, microscopic changes were detected in 6 patients in biopsies from macroscopically normal areas including 3 with granulomas. The upper GI findings were instrumental in making the
diagnosis of Crohn's disease in 13 patients, either because of granulomas found only in the upper GI tract (9) or because of clear-cut inflammatory changes in children who would otherwise have been classified as ulcerative colitis (1) or "nonspecific" colitis (3).

The terminal ileum was viewed in 18 cases; abnormalities were found in 14 (78%), including granulomas in 5. The colon was affected to some extent in 16 patients (70%) with macroscopic and microscopic abnormalities. The proximal colon was affected more frequently than the distal colon and rectum. Pancolitis was present in 4 cases. Granulomas were found in colonic biopsies from 5 patients.

**Discussion**

In recent years it has become our routine practice to perform both upper and lower GI endoscopy and systematically take biopsies from all levels of the GI tract in children and adolescents in whom inflammatory bowel disease is suspected. The techniques are safe and effective in experienced hands and can provide valuable information from the upper GI tract, ileum, and colon, enabling a diagnosis to be established and allowing assessment of the extent and distribution of disease. Not all patients in the series were investigated in this way. In some the diagnosis was made prior to the general availability of these techniques; in others the initial diagnosis was made at the time of surgery or by other diagnostic methods.

Twenty-three patients have been investigated with upper and lower GI endoscopy. An unexpected finding has been the high incidence of upper GI involvement (86%), even in patients with no upper GI symptoms. Microscopic abnormalities have been found in biopsy specimens from macroscopically normal areas. In over one-half of the patients the upper GI findings were instrumental in establishing the diagnosis, by demonstrating either granulomas or the extent and distribution of the inflammatory process throughout the GI tract. Two patients had involvement of the mouth. In 4, the oesophagus was involved, and in 2 of these oesophageal symptoms were the reason for presentation.

Although Crohn's disease of the upper GI tract is being recognised more frequently, it has still been considered relatively uncommon (1%-5%) [4, 9] and has usually not been looked for in the absence of obvious upper GI symptoms. More recently, much higher incidences have been reported [3-7, 10]. In 1985, Schmitz-Moorman et al. [11] reported upper GI involvement in 60% of 225 patients (mostly adults) with Crohn's disease. Jutin et al. [5] found evidence of upper GI disease in 36 of 129 adult patients undergoing gastroscopy. Lenaerts et al. [6], in a retrospective study of 230 children and adolescents, reported 69 (30%) with lesions in the oesophagus, stomach, or duodenum detected by radiology, endoscopy, or surgery at some stage, not necessarily on presentation. Endoscopies were not performed in patients without suggestive symptoms, and the authors considered that (consequently) the incidence of 30% was likely to be an underestimate.

Griffiths et al. [3] reported 10 cases of gastroduodenal Crohn's disease in a retrospective review of 196 children, but only 25 of these had had upper endoscopy, and then only because of symptoms. Mashako et al. [7] have done systematic upper endoscopy with biopsies in 31 children with Crohn's disease regardless of symptoms, 13 of whom (42%) had signs of upper GI disease. Our figure of 86% upper GI involvement is higher than any previously published. However, this is a small series and the results will need to be confirmed in a larger number of patients.

Ileo-colonoscopy is a safe and practical technique in children. The whole colon and usually also the terminal ileum can be inspected and biopsy material for histological examination obtained. Contrast radiology has little to offer in regions that can be endoscopically inspected and biopsied as macroscopic lesions can be missed and a tissue diagnosis cannot be made.

In this series, the terminal ileum or proximal colon was found to be involved in about 70% of cases, but only about one-third of patients had demonstrable disease in the rectum or lower sigmoid. Therefore, in about two-thirds of our patients sigmoidoscopy would have failed to detect lower GI involvement.

In conclusion, it is now our usual practice and recommendation to perform upper and lower GI endoscopy (including ileoscopy) and to collect biopsies at all levels of the GI tract early in the assessment of children and adolescents with suspected inflammatory bowel disease. A high incidence of upper GI involvement can be expected, which may clinch the diagnosis. Barium follow-through examination of the small intestine is appropriate in order to gain information about those areas of the GI tract that are currently inaccessible to the endoscope. Upper and lower GI endoscopy also has an important role in the continuing assessment of disease activity, distribution, and response to treatment in patients with Crohn's disease.

**Table 1. Sites of inflammation: distribution of involvement in 23 patients as assessed by endoscopy and biopsy**

<table>
<thead>
<tr>
<th>Location</th>
<th>Macropscopic</th>
<th>Microscopic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>No. (%)</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>(23)</td>
<td>4 (17)</td>
</tr>
<tr>
<td>Stomach</td>
<td>(23)</td>
<td>13 (57)</td>
</tr>
<tr>
<td>Duodenum</td>
<td>(23)</td>
<td>4 (17)</td>
</tr>
<tr>
<td>Ileum</td>
<td>(18)</td>
<td>12 (67)</td>
</tr>
<tr>
<td>Caecum</td>
<td>(20)</td>
<td>12 (60)</td>
</tr>
<tr>
<td>Transverse colon</td>
<td>(21)</td>
<td>10 (48)</td>
</tr>
<tr>
<td>Sigmoid colon</td>
<td>(23)</td>
<td>9 (39)</td>
</tr>
<tr>
<td>Rectum</td>
<td>(23)</td>
<td>4 (17)</td>
</tr>
</tbody>
</table>

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