APPLICATION OF ENDOSCOPY IN PEDIATRIC PATIENTS

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SUMMARY

Thirty-five pediatric patients ranging in age between 8 months and 14 years were endoscoped in order to diagnose the cause of abdominal pain, gastrointestinal bleeding, growth failure, diarrhea or constipation.

Upper gastrointestinal endoscopic procedures were performed in 10 patients. Twelve patients underwent colonoscopy in addition to 9 patients who were examined by rigid rectoscopy. Endoscopic polypectomy was performed in 4 patients.

Intravenous sedation was given to all cases. No life threatening complications occurred. Endoscopic procedures appeared more sensitive than barium contrast studies in the diagnosis of gastrointestinal diseases.

Key word: Endoscopy, gastrointestinal tract, pediatric patients.

INTRODUCTION

Endoscopic examination of the gastrointestinal tract has become a widely used diagnostic method in pediatrics (1, 2, 3, 4). Recent advances in fiberoptic technology now permit the use of small caliber instruments even in small infants. Currently, endoscopic procedures are used for diagnostic and therapeutic interventions.

The purposes of this paper are to report our experience on 35 pediatric patients, to determine the value of the endoscopic procedures in the diagnosis and treatment of gastrointestinal diseases, to report the complication rate, and to show the application of endoscopic techniques in pediatric age groups.

PATIENTS AND METHODS

35 patients ranging in age from 8 months to 14 years (mean 7 years) were endoscoped at Marmara University Medical Center Department of Pediatrics, between March 1988 and January 1989. 15 of the patients were less than 5 years old. 18 patients were male and 17 female.

31 diagnostic and 4 therapeutic endoscopic procedures were performed. These were, upper gastrointestinal endoscopy (esophagoscopy, gastroscopy and duodenoscopy), colonoscopy, rectosigmoidoscopy and endoscopic polypectomy.

Sedation:

All procedures were performed with I.V. sedation. The following drugs were used in all patients; diazepam (0,3 - 0,5 mg/kg), meperidine (1-2 mg/kg). Antihistaminics or promethazine (1 mg/kg) were administered in some cases. None of the patients received local anesthesia to the pharynx.

Upper gastrointestinal (UGI) endoscopy:

10 patients (4 male, 6 female) ranging 10 in age from 6 to 14 years (mean 9.8 years) were endoscoped (table 1). Chronic abdominal pain was the commonest complaint prior to the procedure. One patient was brought with the complaint of chest pain with a history of suspected ingestion of a piece of glass. Another asthmatic female patient complained of a chronic burning sensation in chest and abdominal pain. One male child had a history of spastic type of cerebral palsy with feeding problems, chronic abdominal pain and anemia. Upper GI endoscopy was performed in one case for the evaluation of malabsorption and to obtain an endoscopic biopsy.

All patients were kept N.P.O at least 6-8 hours prior to procedure. An Olympus GIF Q10 fiberscope was used for upper gastrointestinal endoscopy. This instrument has a field of view of 120°, diameter of 11 mm., a working length of 1030 mm. and a bending section of; up 210°, down 90°, right 100°, left 100° with 4 way control.

Colonoscopy

Colonoscopy was performed in 12 children (9 male and 3 female). The mean age was 8 years (3,5 - 14 years). The presenting complaints were variable (table 1). 3 patients were endoscoped for the investigation of growth failure. Rectal bleeding was the most frequent indication for the procedure 3 patients who were complaining of chronic bloody-mucousy diarrhea were evaluated and biopsied in order to diagnose inflammatory bowel disease.

An olympus CFI TOL colonoscope was used for endoscopic examination. The instrument has a field of view of 120°, diameter of 14 mm, a working length of 1680 mm, and a bending section of; 180° up and down, 160° right and left, with 4 way control. All patients were prepared for the procedure by administration of laxatives and a special diet for bowel cleaning.

Rectosigmoidoscopy:
9 patients underwent this procedure for the investigation of rectal bleeding, abdominal pain or failure to thrive. One patient who was 8 months old was endoscoped because of rectal bleeding and diarrhea secondary to antiobiotic treatment given for gastroenteritis. 7 of them were female and the mean age was 3,4 years (8 months to 8 years).

Procedures were performed with a Heine Rigid Rectoscope designed for children and infants and has a working length of 20 cm. No bowel cleaning was performed for infants, but cleaning enemas were applied to older children.

Endoscopic polypectomy:
An olympus fiberscope polyp snare and a Petkot 450 S electrocoter (Petas Co) were used for polypectomy.

Colonoscopic polypectomy was performed in 4 patients who ranged in age from 5 to 12 years (mean 7 years). Pedinculated polyps were removed in 2 patients at the 20 and 40 th cm of the colon. In one patient multiple sessile and pedinculated polyps were found and a large polyp causing bleeding was taken. Another patient who was diagnosed as having Crohn's disease also underwent polypectomy for the removal of an inflammatory polyp causing rectal bleeding.

RESULTS

Upper gastrointestinal endoscopy (table II).
The instrument was advanced up to the third portion of the duodenum in 7 cases. No abnormalities were detected by endoscopy in 5 patients although radiologic investigations were abnormal in 3 of them. Severe esophagitis was found in one patient who suffered from cerebral palsy. An inflammed and erythematous esophageal mucosa was seen at the gastroesophageal junction in a female patient who was on theophylline treatment for asthma. Radiologic methods failed to reveal these kinds of pathology. Pyloric ulcer and narrowed pyloric canal were identified in one patient who was also shown to have a gastric bezoar. This mass was broken to several small pieces and some of them were aspirated. No foreign body was found endoscopically although in one patient there was a history of swallowing a piece of glass.

Other than aspiration of gastric fluid in one patient, no life threatening complication occurred during and following the procedure.

Colonoscopy and rectosigmoidoscopy (table III).
In 3 of 12 colonoscopies no abnormality was detected. Polyps were found in 4 of the 8 patients who presented with rectal bleeding. One of them had multiple small and large polyps in the sigmoid and transverse colon. In another patient who suffered from juvenile rheumatoid arthritis, multiple ulcerative lesions and a markedly hyperemic and friable mucosa were detected in addition to a pedinculated polyp. Barium enema failed to reveal the presence of polyps in one patient. Radiologic studies were not successful in determining abnormal findings such as marked vascular enlargements in the recto-sigmoid area. No complication occurred secondary to colon oscopy, and total examination including the right side of the colon was performed in 3 cases. We were able to pass the colonoscope up to the hepatic flexur in the remaining patients.

Although 15 cm of the colon was examined by restosigmoidoscopy, no pathologic condition was found in 55 % of the cases with rectal bleeding. Hyperemic and markedly friable mucosa with membranes were found in one patient who suffered from chronic diarrhea and failure to thrive. One patient could not tolerate the procedure due to unsuccessful sedation.

DISCUSSION

Although conventional methods such as radiologic tests are more widely used diagnostic tools in pediatrics, currently, endoscopy has been accepted one of the most sensitive procedure in pediatric gastroenterology (1, 5). Application of endoscopic methods, however requires an advanced endoscopy unit in addition to a specialized pediatric gastroenterologist.

Because of the large caliber of our instrument, upper gastrointestinal procedures were performed in pediatric patients who were older than 6 years old. They easily tolerated endoscopy when appropriate sedation was given for their age and body weight. Esophageal tears and traumatic complications have been reported related to endoscopy especially in patients who were not well sedated (1, 5, 6, 7). Upper GI endoscopy appeared more successful than barium contrast studies in the diagnosis of the pathologies. Radiologic investigations were performed 1 to 4 weeks prior to endoscopy. Probably due to the poor cooperative nature of pediatric patients radiologic films failed to reveal mucosal pathologies in 2 cases.

Although, no abnormalities were detected by colonoscopy in some patients, endoscopy was superior to barium enema in revealing the mucosal lesions of the colon. We were not able to pass the endoscope to visualize the cecum because of the poor flexibility and large caliber of the instrument in small patients. Rectosigmoidoscopic examination was performed however in small infants and tolerated well in the presence of mild sedation. Similar observations had been reported previosly by different groups (6, 8). Colonoscopic polypectomy was also quite a safe procedure in our practice although many complications may exist (9). None of our patients had significant bleeding following biopsy of the colonic mucosa or removal of polyps.

Since endoscopic techniques are safe and tolerated well by pediatric patients this method can be the

Table I. Symptoms and findings prior to endoscopy

	No. of cases
Upper Gastrointestinal Endoscopy	**10**
Chronic Abdominal pain	7
Nausea and/or vomiting	3
Chest pain/dysphagia	2
UGI bleeding	1
Colonoscopy	**12**
Rectal bleeding	10
Abdominal pain	7
Diarrhea	3
Failure to thrive	3
Constipation	2
Rectosigmoidoscopy	**9**
Rectal bleeding	8
Constipation	5
Abdominal pain	3
Failure to thrive	2
Diarrhea	1
Rectal pain	1
Endoscopic polypectomy	**4**
Rectal bleeding	4
Anemia	3
Abdominal pain	3
Diarrhea	1

Table II. Findings determined by UGI endoscopy and radiology.

Diagnosis	No. of cases	Identified by Endoscopy	Radiology
No abnormalities found	5	5	2 of 5*
Pyloric ulcer	1	1	1
Duodenal ulcer	1	0	1
Gastric bezoar	1	1	0 of 1
Esophagitis	2	2	0 of 2
Narrowing at the pylorus	1	1	1 of 1

* Duodenal ulcer (2 cases), pylorospasm (1 case) were determined radiologically.

Table III. Findings determined by colonoscopy, rectosigmoidoscopy and radiology

Diagnosis	No of cases	Identified by Endoscopy	Radiology
Polyps	4	4	3 of 4
Vascular enlargement	2	2	0 of 2
Friable and hyperemic mucosa	3	3	0 of 2
Pseudomembrane formation	1	1	0 of 1
Ulcerative lesions	3	3	1 of 2
Hemorrhoid	2	2	-
Anal fissur	1	1	-
Anal skin tag	1	1	-
No abnormalities found	8	8	5 of 6*

* Stricture was determined at the sigmoid colon by barium enema.

first choice in the diagnosis and management of many gastrointestinal diseases in pediatrics. Following the development of better fiberoptic techniques, endoscopic procedures will be possible in smaller infants for different purposes.

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