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Case and Review

Gastric Outlet Obstruction due to Intramural Duodenal Hematoma after Endoscopic Biopsy: Possible Therapeutic Role of Endoscopic Dilation

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Keywords

Intramural duodenal hematoma · Endoscopic biopsy · Gastric outlet obstruction · Endoscopic dilation

Abstract

Intramural duodenal hematoma (IDH) is an extremely rare complication after endoscopic biopsy. It typically presents with symptoms due to duodenal obstruction, which include abdominal pain and bilious vomiting. The hematoma may also expand and cause ampullary compression leading to pancreatitis and cholestasis. Computed tomography scan and abdominal ultrasound are the most common diagnostic modalities. Treatment is usually conservative, with bowel rest, nasogastric suctioning and total parenteral nutrition. Refractory cases have been described, requiring endoscopic therapy or surgical drainage. We describe a 28-year-old healthy male who presented with acute abdominal pain a few hours after a routine esophagogastroduodenoscopy with biopsies was performed. Following an otherwise uneventful endoscopy, he developed a gastric outlet obstruction and pancreatitis secondary to an IDH. The patient was managed conservatively. Resolution of his gastric outlet obstruction occurred immediately after gentle passage of the endoscope through the narrowed duodenal lumen.

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Introduction

Intramural duodenal hematoma (IDH) is an uncommon condition, first described in 1838 by McLauchlan [1]. The majority of cases are seen in children secondary to blunt abdominal trauma. It has been also reported in patients with underlying risk factors, such as coagulopathy, platelet dysfunction, anticoagulant therapy and as a rare complication after endoscopic interventions [2–12].

The first IDH following endoscopic biopsy was reported in 1989 by Zinelis [2]. Upper gastrointestinal endoscopy is a relatively safe and well-established diagnostic procedure for the evaluation of a myriad of gastrointestinal complaints. Complications after upper endoscopy are rare. These are most often related to sedation, methemoglobinemia (if topical anesthetics are used), infection, bleeding and perforation. IDH is an exceptionally rare complication following endoscopic biopsy, especially in the absence of risk factors. It is more frequently seen in children secondary to blunt trauma. In adults without risk factors, it has only been reported in several case reports.

Case Report

A 28-year-old healthy male presented with epigastric pain radiating to his back, nausea, vomiting (nonbloody, nonbilious), and intractable hiccups within a few hours after an upper endoscopy. The endoscopy had been performed for evaluation of reflux, solid food dysphagia, and 9-lb weight loss over 6 months, of a 185-lb initial weight. The endoscopy had revealed reflux esophagitis and was otherwise normal. Duodenal, gastric, and esophageal biopsies were taken using a standard sized biopsy forceps. He denied any recent trauma or alcohol use and had no history of bleeding tendencies or medication use. Physical examination was significant for tachycardia, epigastric fullness, and tenderness. Bowel sounds were present. Stool was negative for occult blood. Laboratory evaluation showed a white blood count of 13,700/mm³, lipase 10,830 IU/L, and bilirubin of 0.9 mg/dL on admission (peaking at 3.5 mg/dL on day 5, with a direct bilirubin of 1.6 mg/dL). Other liver biochemistries including AST 19 IU/L, ALT 41 IU/L, alkaline phosphatase 69 IU/L, and albumin 4.5 g/dL were normal. Hematological testing revealed INR 1.1, Von Willebrand Factor 84 IU/dL, normal factors VIII, IX, XIII, and platelet function. CT scan of the abdomen with oral contrast was remarkable for thickening of the duodenal wall to 5 cm with lack of emptying of contrast beyond the pylorus and a “coil-spring sign” (Fig. 1). Pathology of the biopsies taken prior to admission showed normal mucosa. Nasogastric suction yielded the immediate return of 1.3 L of nonbilious, nonbloody fluid. The patient was treated with bowel rest, proton pump inhibitor therapy, and nasogastric tube suction. Total parenteral nutrition was not required. Due to persistent gastric outlet obstruction, endoscopy was performed on day 5. This showed a gastric outlet obstruction caused by a submucosal duodenal hematoma (Fig. 2). There was compression of the ampulla of Vater (Fig. 3). The endoscope was gently advanced through the narrowed duodenal lumen. This simple passage of the endoscope appeared to open up the duodenal narrowing. Endoscopic balloon dilation was not elected, since the simple passage of the endoscope appeared to open the narrowing sufficiently to relieve the gastric outlet obstruction. Immediately following the

procedure, the patient was able to tolerate oral intake. He was discharged on a general diet on day 7.

Discussion

Upper endoscopy is commonly performed and carries a low risk of adverse events. Large series report adverse event rates of 1 in 200 to 1 in 10,000 and mortality rates ranging from none to 1 in 2,000 [13]. Some of those recognized adverse events include cardiopulmonary events related to sedation and analgesia, bleeding, and perforation. In recent years, IDH has been recognized as a rare complication after endoscopy. In one study the incidence was estimated to be 1 in 1,250 [3].

The majority of cases have been seen in children following blunt trauma. IDH after endoscopic biopsy usually occurs in patients with predisposing risk factors such as coagulopathy, platelet dysfunction such as von Willebrand's disease, and anticoagulant therapy [2, 3, 5–7]. Other risk factors include graft versus host disease and bone marrow transplant [7]. It has also been described as a rare complication following endoscopic interventions, including injection sclerotherapy and endoscopic retrograde cholangiopancreatography with sphincterotomy. Our goal was to review reported cases of IDH complicating endoscopy in adults. To the best of our knowledge, only several case reports on IDH following endoscopy in adults have been described (Table 1).

Intramural hematomas of the gastrointestinal tract tend to occur mostly in the duodenum. This is mainly due to the fixed retroperitoneal position of the duodenum, its rich submucosal vascular plexus, and the lack of a well-developed serosal layer [12]. Traction on the duodenal mucosa by the endoscopic forceps during a biopsy may strip a substantial area of mucosa away from the immobile wall beneath it, tearing those vessels. It has been suggested that the endoscopic forceps should not be advanced more than 3 cm beyond the tip of the endoscope to grasp the mucosa [2] to minimize shearing.

The symptoms of IDH are related to duodenal obstruction and can present with abdominal pain and bilious vomiting. It may also compress the ampulla and lead to pancreatitis, as occurred in our case. To prevent pancreatitis, it has been proposed that duodenal mucosa be sampled as far away from the papilla as possible [3].

Based on this review of the literature, the onset of symptoms of IDH can vary from immediately after to up to 4 days post-endoscopy. Variable imaging techniques used to confirm the diagnosis include ultrasound, CT scan, MRI, upper gastrointestinal series, and endoscopy. The barium study may show a “coil spring sign,” which has been described as pathognomonic of intramural hematoma [4].

The two established management approaches are conservative or surgical. Conservative management, which includes nasogastric tube suctioning, nothing by mouth, and supportive therapy with intravenous fluids and sometimes intravenous nutrition, is preferred due to favorable outcomes as evidenced in this case series. It is possible that the endoscopy performed in our case assisted in “dilating” the passageway through the duodenum via the endoscope traversing through the lumen and thereby expanding open the duodenal narrowing. This raises the possibility of applying endoscopic balloon dilation as another potential method of alleviating the gastric outlet obstruction. Although it is possible that our patient's gastric

outlet obstruction resolved simply with the passage of time, it was visually very apparent that the endoscopic passage through the narrowed duodenal lumen led to opening up of the gastric outlet obstruction. Our observation of improvement immediately after simple passage of the endoscope through the narrowed duodenal lumen, and the possibility of applying endoscopic balloon dilation if needed, raises an alternate potential therapy. Optimal timing of such endoscopic intervention remains to be determined. Surgical intervention is not pursued unless there is no improvement with conservative therapy, perforation is suspected, or if the patient is hemodynamically unstable. The period of time before considering surgery is controversial but appears to be between 7 and 14 days [14–16].

In summary, we describe the rare complication of IDH following upper endoscopy with standard duodenal biopsies in an adult without any predisposing factors. The IDH was severe enough to cause a gastric outlet obstruction and acute pancreatitis. The acute pancreatitis was caused by ampullary compression by the IDH. Our patient responded to conservative therapy. We hypothesize that simple endoscopic passage through the duodenal stenotic area may assist in resolution of the gastric outlet obstruction. This raises the potential of endoscopic balloon dilation as a possible treatment, but this remains to be explored. We conclude that IDH should be considered in patients presenting with symptoms of gastric outlet obstruction and/or acute pancreatitis following an upper endoscopy with duodenal biopsies, even in the absence of any coagulopathy or other identifiable risk factors.

Statement of Ethics

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Disclosure Statement

The authors declare no financial or competing interests related to the publication of this paper.

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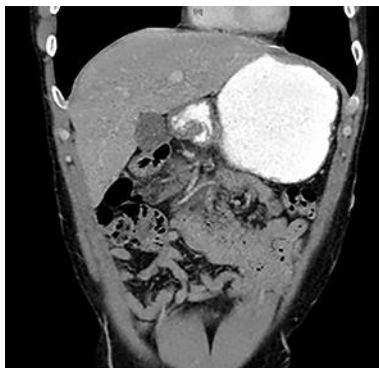


Fig. 1. CT scan: coronal view showing poor emptying of contrast from the stomach and thickened “coil-spring” appearance of the duodenal wall.



Fig. 2. Endoscopic view of intramural duodenal hematoma.



Fig. 3. Ampullary compression (arrow) by duodenal hematoma.

Table 1. Reported cases of IDH after endoscopic biopsy in adults

Case No.	First author	Age, years/ Sex	Indication	Platelets, <i>n</i>	Coagulation	Anti-coagulation	Onset	Biopsies	Management	Additional complications
1	Zinelis [2]	23 M	Malabsorption	62,000	PT/PTT normal	None	1 day	2 mucosal biopsies with standard forceps	Conservative; oral intake after 17 days	Transfusion requirement
2	Lipson [6]	32 F	GVHD	50,000	PT/PTT normal	None	16 h	Standard biopsies of duodenum	Surgical evacuation with drain placement after 3 weeks	Pneumonia, intra-abdominal hemorrhage, ARDS; death after surgery
3	Lipson [6]	36 F	GVHD	54,000	PT/PTT normal	None	6 h	Standard duodenal biopsy showing villous congestion	Conservative; home after day 11	None
4	Worinski [7]	23 M	GVHD	46,000	n/a	None	4 days	2 duodenal biopsies taken from 2nd and 3rd part of duodenum using standard biopsy forceps, showing moderate GVHD	Conservative	Encephalopathy, seizure, death at day 13
5	Lloyd [9]	18 F	Diarrhea	Normal	PT/PTT normal	None	Next day	Standard biopsy forceps biopsy from the duodeno-jejunal flexure showing normal mucosa	Conservative for 15 days then US-guided drainage of hematoma with drain placement; home after 25 days	None
6	Sgouros [8]	32 M	Diarrhea	Normal	PT/PTT normal	None	6 h	Standard forceps; normal mucosa	Conservatively; oral intake at 3 weeks	None
7	Chen [10]	39 M	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported	Conservatively; oral intake after 1 week	None
8	Galea [11]	30 M	Diarrhea	Normal	Not reported	None	A few hours	Not reported	Surgical; home after 3 weeks	Large retroperitoneal hematoma
9	Hoenisch [5]	21 F	Dyspepsia	n/a	PT normal	None	Immediate	6 routine standard forceps biopsies; normal mucosa	Conservative; oral intake after 12 days; home after 19 days	None
10	Samra (this report)	28 M	Dysphagia	244,000	PT/PTT normal	None	A few hours	Standard biopsy forceps; normal duodenum; distal esophagus	Conservative; oral intake after 1 week	None