

Impact of endoscopy in the management of duodenal diverticular bleeding: experience of a single medical center and a review of recent literature

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Background: Duodenal diverticulum (DD) is a rare cause of upper-GI bleeding. The diagnosis and treatment of DD bleeding (DDB) is challenging. Surgical management was the mainstay of therapy before the 1990s.

Objective: To evaluate the clinical feature, diagnosis, and management of cases of DDB at our institution and the literature after the first description of endoscopic therapy of this disease.

Design: Retrospective single-center clinical review.

Setting: Primary- and tertiary-care centers.

Patients: A retrospective study of patients with DDB from January 2000 to January 2005 at Changhua Christian Medical Center.

Main Outcome Measurements: Diagnostic yield and therapy results of endoscopy on DDB.

Results: At our institution, from January 2000 to January 2005, a total of 11 patients (4 men and 7 women, mean age 75 years) were found to have DDB. The diverticulum was located in the second portion ($n = 10$) and the third portion ($n = 1$). Endoscopy was used as the diagnostic method in all of these cases and as the therapeutic method in 72.73% of these cases. None of our patients experienced recurrent bleeding.

Limitations: The study is limited to the small case number and was retrospective.

Conclusions: To our knowledge, this is the first report and the largest series that studied endoscopic management of DDB in the literature. We concluded that endoscopy is useful to diagnose and treat patients with DDB.

Chromel is attributed as being the first investigator to describe, in 1710, the first diverticulum of the duodenum.¹ In the 200 years to follow, however, little clinical significance was attributed to this lesion, and only a few reports of the lesion appeared in autopsy findings. In the early 1950s, Case was the first investigator to demonstrate duodenal diverticula (DD) roentgenologically, and since then, more and more attention has been paid to the lesion.¹ Hemorrhage from a DD is a rare complication; Patterson and Bromberg² were the first investigators to document DD bleeding (DDB) in surgery. The diagnosis was made either radiologically or surgically in the few

documented cases during the 1950s to the 1980s.²⁻⁸ With the advent of endoscopy, Ryan et al⁹ described the first endoscopic diagnosis of DD in 1984, and Sim et al¹⁰ performed the first endoscopic hemostasis of DDB in 1991. In this study, we reviewed 11 consecutive cases of DDB at our institution during a 5-year period. Endoscopy was the mainstay of diagnosis and/or treatment in all of the cases. To our knowledge, this is the first and the largest series in the literature of DDB managed endoscopically. Because it is a rare condition encountered by the endoscopist, we also reviewed the literature from 1991 to 2005¹⁰⁻³⁸ to determine the impact of endoscopy in the diagnosis and management of DDB.

Abbreviations: DD, duodenal diverticulum; DDB, Duodenal diverticular bleeding; ICD-9-CM, International classification of diseases, 9th revision, clinical modification.

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PATIENTS AND METHODS

A retrospective review of the medical records of Changhua Christian Medical Center from January 2000 to

TABLE 1. Clinical feature of patients with DDB

	Our series (n = 11)	Recent literature (n = 31)	Total (n = 42)
Sex (M/F)	4/7	11/20	15/27 (1:1.8)
Mean age (y)	75 (range 67-91)	66.4 (range 45-91)	68.6 (range 45-91)
Shock status (no.)	2 (18.2%; n = 11)	17 (85%; n = 20)	19 (61.29%; n = 31)
Mean Hb (g/dL)	7.45 (n = 11)	7.64 (n = 23)	7.58 (n = 34)
Site of diverticulum (no.)			
2nd portion	10	20	30 (71.43%)
3rd portion	1	6	7 (16.67%)
4th portion	0	4	4 (9.52%)
A-loop	0	1	1 (2.38%)

TABLE 2. Diagnosis methods of patients with DDB

Diagnostic method	Our series (n = 11)	Recent literature (n = 31)	Total no. (%) (n = 42)
	Diverticular location (2nd/3rd/4th/A-loop)	Diverticular location (2nd/3rd/4th/A-loop)	
Endoscopy	11 (10/1/0/0)	20 (15/3/1/1)	31 (73.81)
Operation	0 (0/0/0/0)	6 (2/3/1/0)	6 (14.29)
Upper-GI series	0 (0/0/0/0)	2 (1/0/1/0)	2 (4.76)
Red blood cell scan	0 (0/0/0/0)	2 (1/0/1/0)	2 (4.76)
Angiography	0 (0/0/0/0)	1 (1/0/0/0)	1 (2.38)

January 2005 identified 11 patients with diagnosed cases of DDB. The following ICD-9-CM (*International classification of diseases, 9th revision, clinical modification*) codes for primary discharge diagnosis were used to identify potential cases: 562.00 (diverticulosis of small intestine), 562.01 (diverticulitis of small intestine), 562.02 (diverticulosis of small intestine with hemorrhage), and 562.03 (diverticulitis of small intestine with hemorrhage).

Data were gathered from patient charts, endoscopy records, and operative notes. DDB is defined as follows: (a) active bleeding from any lesion of the DD, (b) adherent blood clot found in the DD in the absence of other bleeder, or (c) ulcers or erosions found only in the DD during an upper-GI bleeding episode. All patients provided written consent to undergo endoscopy, including consent for endoscopic treatments, such as hemoclip, hypertonic saline solution–epinephrine injection, and heat probe. All patients were informed that endoscopic treatment was currently the standard therapeutic approach.

OBSERVATIONS

Clinical features

The clinical features are presented in Table 1. During 2000 to 2005, at our institution, a total of 11 patients (4 men and 7 women) were identified to have DDB. During that period, a total of 7928 patients were admitted because of upper-GI bleeding; only 0.14% had DDB. These 11 patients had a mean age of 75 years (range 67-91 years). Two of the patients presented with shock status (defined as a systolic pressure less than 90 mm Hg). The mean Hb level on presentation was 7.45 g/dL (range 5.8-9.5 g/dL; reference range 14.0-17.0 g/dL). Ten of the patients had the diverticulum located in the second portion of the duodenum, and 1 patient had the diverticulum located in the third portion of the duodenum.

Diagnostic method

The diagnostic methods are presented in Table 2. The diagnosis was made by endoscopy in all of our cases. The endoscopic findings of the 11 cases included (a) ulcers (n = 2), (b) Dieulafoy's lesion (n = 3), (c) angiectasia (n = 1), (d) active bleeding (n = 3), and (e) blood clots in the DD (n = 2). Representative endoscopic findings are shown in Figures 1 to 4.

Therapeutic method and outcome

Therapeutic methods and outcomes are presented in Table 3. In our series, 3 patients were managed conservatively and received an intravenous proton pump inhibitor, without endoscopic therapy. Three patients received heat probe coagulation, 3 received injection therapy, and 2 received combined injection therapy and hemoclip therapy. None of our patients showed signs of recurrence during the follow-up period, and no patients had complications related to the procedure.

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