

Upper gastrointestinal Dieulafoy's lesions and endoscopic treatment: First report from a Mexican centre

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Abstract: The aim was to evaluate the initial success, rebleeding rate, need for emergent surgery, and mortality rates of patients with Dieulafoy's lesion (DL) and endoscopic treatment (ET). Patients with DL from a tertiary center were included. We included 20 patients with follow-up of 90 (60–550) days. The lesser curvature was the most common localization. Initial success, rebleeding, and emergent surgery requirement were observed in 90%, 10%, and 15%, respectively. No objective variables were related with response to ET. In conclusion, ET is secure and useful in patients with DL and it must be considered as the first-line treatment modality.

Keywords: Gastrointestinal bleed, Dieulafoy's lesion, endoscopic treatment

Introduction

Dieulafoy's lesion (DL) was first described by Gallard in 1884 and defined by George Dieulafoy in 1886 [Katsinelos *et al.* 2005]. DL is an abnormal winding arterial vessel that projects onto muscularis mucosae of the gastrointestinal tract and can initiate massive bleeding [Romãozinho *et al.* 2004]. It represents about 0.3–6% of all the causes of gastrointestinal bleeding and the most frequent localization is the proximal stomach. However, it can be found throughout the gastrointestinal tract [Ertekin *et al.* 2002; Kayali *et al.* 2000; Azimuddin *et al.* 2000; Nozoe *et al.* 1999; Gadenstätter *et al.* 1998; Goldenberg *et al.* 1990]. Treatment of DL has not been standardized and there are no guidelines for management. Due to the low incidence of DL, there are mainly case reports and some series that describe the role of endoscopic treatment (ET), most of them descriptive and retrospective. Currently, ET is the mainstay therapy for this entity [Savides and Jensen 2000] with low mortality rates [Norton *et al.* 1999; Fockens and Tytgat 1996]. The objective of this study was to report the initial success, rebleeding, need for emergency surgical treatment and mortality

rates in patients with DL and ET for the first time from a single centre in Latin America.

Material and methods

This was a retrospective analysis of data collected from paper and electronic records of endoscopic procedures performed in a single tertiary institution in Mexico, from March 2002 to June 2007. Demographics, laboratory and clinical data were investigated. Initial success rate, the need for emergency surgical intervention, rebleeding, 30-day mortality and type of endoscopic therapy were recorded. The study was approved by the Ethical Review Board.

DL was defined according to the following criteria: presence of active arterial bleeding without an ulcer base or visualization of a protruding vessel from a minute mucosal defect (≤ 3 mm) and a normal surrounding mucosa [Juler *et al.* 1984]. In our institution we do not have an electronic endoscopic database but all paper records have a photo attached from the lesion. To consider the diagnosis of DL as correct, a revision from all the endoscopic charts was performed

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and all paper photos were reviewed by three authors (FTA, GLA, MARL). Initial success was considered when hemostasia was reached by endoscopy; in patients with no active bleeding during the endoscopy, initial success was accomplished when ET was applied without immediate bleeding. Rebleeding was considered in the following situations: (1) a drop in the hemoglobin level by 2 g/dl after ET, (2) presence of melena and/or hematemesis, (3) shock (systolic arterial pressure <100 mmHg, pulse >100 beats per minute) with further evidence of gastrointestinal blood loss after initial blood transfusion and stabilization, and (4) when bleeding from DL was confirmed by endoscopy or surgery. Upper endoscopy was repeated in cases of suspected persistent or recurrent bleeding.

All endoscopic procedures were performed under deep sedation using Olympus GIF-Q100, GIF-Q130, GIF-Q140 or GIF-Q160 endoscopes (Olympus America Inc., Centre Valley, PA). The type of treatment employed for each case was decided by the endoscopist at the moment of procedure. The different endoscopic treatment modalities included were: injection of epinephrine (adrenaline) (dilution 1:10,000), heat probe (Olympus Optical, Tokyo), argon-plasma coagulation (APC) (Olympus Optical, Tokyo), hemoclips (Olympus Optical, Tokyo), and rubber band ligation. Single or dual therapy was considered.

For the purpose of this paper, we considered as responders to ET those patients who had initial success with ET, no rebleeding after endoscopic

treatment, no need for surgical treatment, and no mortality. Nonresponders were considered those patients with no initial success with ET, rebleeding after endoscopic treatment, need of surgical treatment or mortality.

Statistical analysis

Results are expressed as medians, ranges, and absolute and relative frequencies. The differences between proportions of categorical data were obtained by the Fisher exact test when the number of expected subjects was less than five and by the Chi-square test otherwise. Quantitative data were analysed with Mann-Whitney U-test. A P-value ≤0.05 was considered statistically significant. All statistical analyses were conducted using the statistics program SPSS/PC version 12.0 (Chicago, IL, USA).

Results

DL was observed in 20 (0.09%) of a total of 22,283 upper gastrointestinal endoscopies. Eleven (55%) patients were male, median age was 63.5 (22–86) years. The mean follow-up period was 90 (60–550) days. Ten (50%) patients presented with hemodynamic instability, melena was the initial symptom in seven (35%) cases and hematemesis in other seven (35%), and both were observed in four (20%) patients, and two patients with history of melena. Active hemorrhage was observed in 12 (60%) cases at the moment of the endoscopic evaluation. Eighty per cent of our patients had some co-morbidity. Table 1 shows the

Table 1. Demographics, clinical characteristics, and response to endoscopic therapy of 20 patients with Dieulafoy’s lesion.

	Male										Female									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Age (years)	39	47	49	49	59	62	62	74	78	85	86	22	52	62	63	64	66	68	75	78
Active bleeding	—	—	Y	—	Y	—	—	Y	—	Y	Y	Y	—	Y	—	Y	Y	Y	Y	Y
Hb, g/dl	10.8	12	7.5	7	5	9	8.9	7	11	7.2	8.4	8.8	8.9	8.9	10.8	8.8	4.4	13	14.4	10.9
Initial symptom	M	B	M	B	B	H	M	M	H	M	H	H	H	M	B	H	M	Mh	Mh	H
Location	LC	A	LC	GC	GC	LC	LC	D	LC	D	LC	GC	GEJ	A	GF	D	D	LC	A	A
Blood units	0	0	2	2	5	1	2	2	0	3	3	1	2	2	0	2	8	0	0	1
No. of procedures	2	1	1	2	1	1	3	3	1	3	2	1	6	1	3	5	4	3	2	1
Medication	—	—	Atp	—	—	NS	—	NS	—	Ac	NS	Ac	—	—	—	—	—	NS	—	NS
Initial success	Y	Y	Y	Y	—	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	—	Y	Y	Y	Y
Rebleeding	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Y	—	Y	—
Surgery	—	—	—	—	Y	—	—	—	—	—	—	—	—	—	—	Y	Y	—	—	—

Symbol — = no; Y = yes; M = melena; H = hematemesis; B = both (melena + hematemesis); Mh = history of melena; LC = lesser curvature; A = antrum; GC = greater curvature; D = duodenum; GEJ = gastro-esophageal junction; GF = gastric fundus; Hb = hemoglobin; Atp = antiplatelets; NS = nonsteroidal anti-inflammatory drugs; Ac = anticoagulants; St = steroids.

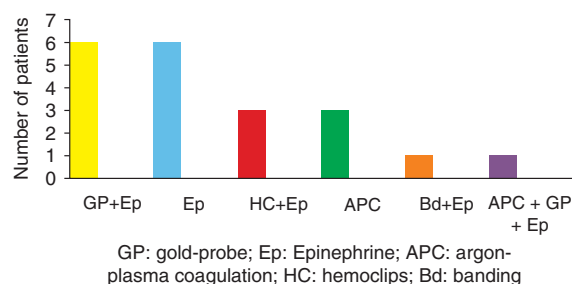


Figure 1. Different modalities of endoscopic treatment used in the study.

characteristics of patients, endoscopic procedures and final outcomes. The median baseline value of hemoglobin was 8.8 g/dl (range 4.4–14.4 g/dl) and median INR was 1.1 (0.9–1.5). The most frequent location of DL was the lesser curvature in seven patients (35%), followed by antrum and duodenum in four (20%) each, and greater curvature in three (15%), gastric fundus and gastro-esophageal junction was observed in one (5%) each. The different modalities of ET are shown in Figure 1. The mean volume of epinephrine injected was 10 ml (range 4–14 ml).

Initial success was observed in 18 out of 20 (90%) cases, rebleeding was present in 10% and emergency surgery was necessary in 15%. No mortality was observed. Failure to initial treatment was observed in two (10%) patients who underwent surgery. Two of three patients that required emergency surgery were treated initially with epinephrine injection as a single therapy. The median number of blood units transfused was 2 (0–8). The median number of endoscopic procedures performed in each patient was 2 (1–6). The diagnostic yield for DL in the first endoscopy was 15 (75%) patients.

Objective variables such as age, gender, location of DL (stomach *vs* duodenum), haemodynamic instability, presence of active bleeding at the moment of endoscopy or type of treatment employed (single or combined) were not related to initial success rate, rebleeding rate or surgery requirement (Table 2). No complications were observed with any modality of ET.

Discussion

This work represents the first report with ET in DL from a Spanish-speaking country centre and includes only patients with DL in the upper GI tract. No objective variable was associated with

Table 2. Patients classified by response to endoscopic therapy (ET)*.

Variable	No. responders, $n=4$ n (%) †	Responders, $n=16$ n (%) ‡	<i>P</i> -value
Sex, male	1 (25)	10 (62.5)	0.28
Haemodynamic instability	3 (75)	7 (43.8)	0.58
Active bleeding	3 (75)	9 (56.3)	0.61
Modality ET, single§	2 (50)	7 (44)	1
Localization, stomach	2 (50)	14 (87)	0.16
Mechanical ET	1 (25)	3 (20)	0.62

*Non-responders: no initial success, presence of rebleeding, need of emergency surgery or death.

† Median (range) of age in years was 65 (59–75).

‡ Median (range) of age in years was 62.5 (22–86).

§ Only epinephrine injection (six patients) and argon plasma coagulation (three patients) were used as single ET.

Mechanical ET: haemoclips and rubber band ligation.

response to ET and it was a safe and effective method in DL treatment. Clinical features of the patients with DL in the present study were similar to those of patients reported previously in other series [Iacopini *et al.* 2007; Walmsley *et al.* 2005; Dafnis *et al.* 2001; Norton *et al.* 1999].

In our centre, the two most frequent modalities used were gold-probe plus epinephrine (GP + Ep) as one, and epinephrine as a single therapy as the other, each compromising 30% of total treatment. The use of GP + Ep in our series had excellent results. None of the patients in this treatment group (GP + Ep) presented failure to ET. On the other hand, the use of epinephrine as a single therapy did not show good results—two of the three (66%) patients that required surgery were treated initially with this ET modality.

Regardless of heterogeneity of ET modalities used in our series, this study assessed objective variables to investigate possible differences between patients who responded to ET and patients who did not. In accordance with our data, any variable was statistically significant, but patients with a DL located in the stomach showed a tendency to respond better to initial ET, with lower rebleeding rates and emergency surgery requirement (Table 2). This finding could be helpful in the design and analysis of future studies and in clinical practice.

DLs are located in the proximal stomach in more than three-quarters of affected patients [Katsinelos *et al.* 2005; Fockens and Tytgat 1996]. In 16/20 (80%) of our patients the

lesion was found in the stomach and in 12/20 (60%) in the classic site within 6 cm of the gastro-esophageal junction. The reason for including only DL in the upper GI tract was due to the difficulty of applying and comparing ET (injection, thermal or mechanical) along the different segments of digestive tract [Iacopini *et al.* 2007; Dafnis *et al.* 2001]. The heterogeneity of ET modalities used in our series is evident, but a small number of studies exclusively with a unique modality of ET (with small sample size) have been published [Iacopini *et al.* 2007; Yamaguchi *et al.* 2003; Nikolaidis *et al.* 2001; Chung *et al.* 1991; Park *et al.* 2003] and all of them with similar results to our data. For these two reasons we consider that each ET modality should be individualized and must be determined by the location of the lesion, the risks of specific interventions and the endoscopist's skill. Contact thermal methods need to precisely target the lesion and can be associated with deep tissue damage and a risk of perforation, particularly in areas where the bowel wall is thin [Chung *et al.* 1991]. The application of hemoclips is safe and effective, even in a patient with coagulation disturbances, but it is difficult to apply correctly when the lesion is tangential or visible only in the retroflexed position of the endoscope [Raju and Gajula *et al.* 2004]. On the other hand, APC can be very easily applied to lesions through frontal and lateral probes, independently of their location [Iacopini *et al.* 2007]. The use of epinephrine injection as a single therapy has no statistical significance as a related factor for response or nonresponse to ET. However, in our study epinephrine injection was used in six cases as monotherapy and two (33%) of these patients underwent emergency surgery. We consider that the *P*-value is related to the small sample size in our study. Therefore we recommend that if epinephrine is going to be used, it is necessary to apply double ET, which could be considered an extrapolation of the recommendations for peptic ulcer treatment [Marmo *et al.* 2007]. A comparison was made between mechanical (hemoclips and rubber band ligation) *vs* thermal therapy, and regarding response to ET, no differences were found (Table 2).

Some reports have documented significant diseases in patients with DL [Norton *et al.* 1999; Juler *et al.* 1984]. Comorbidity of cardiovascular diseases, diabetes, chronic renal failure and hypertension is present in almost 90% of patients

with DL [Norton *et al.* 1999]. In more than 40% of patients with DL, the use of anticoagulants/antiplatelet drugs has also been noted [Norton *et al.* 1999; Juler *et al.* 1984]. However, other studies have found no association of DL with concomitant disease or the use of medications [Katz and Salas 1993; Veldhuyzen-van-Zanten *et al.* 1986]. The results of the present investigation are consistent with the first mentioned studies, with a high prevalence of comorbidity (80%) and use of anticoagulants/antiplatelet drugs (40%).

Limitations of the study have to be mentioned: first of all, the small sample size and second of all, the retrospective design. However, it would be difficult to perform a large prospective study, and even more a randomized controlled trial, due to the low incidence of DL. Moreover, this series represents the first report from a Latin American centre for future comparison.

In conclusion, ET is safe and useful in patients with DL and because the high initial success rate, low rate of rebleeding and absence of mortality; it must be considered as the first-line treatment modality. No objective variables were related to initial success, rebleeding and emergency surgery requirement.

Conflict of interest statement

None declared.

References

- Azimuddin, K., Stasik, J.J., Rosen, L., Riether, R.D. and Khubchandani, I.T. (2000) Dieulafoy's lesion of the anal canal: a new clinical entity. Report of two cases. *Dis Colon Rectum* 43(3): 423–426.
- Chung, S.C., Leung, J.W., Sung, J.Y., Lo, K.K. and Li, A.K. (1991) Injection or heat probe for bleeding ulcer. *Gastroenterology* 100: 33–37.
- Dafnis, G., Ekblom, A., Pahlman, L. and Blomqvist, P. (2001) Complications of diagnostic and therapeutic colonoscopy within a defined population in Sweden. *Gastrointest Endosc* 54(3): 302–309.
- Ertekin, C., Barbaros, U., Taviloglu, K., Guloglu, R. and Kasoglu, A. (2002) Dieulafoy's lesion of esophagus. *Surg Endosc* 16(1): 219.
- Fockens, P. and Tytgat, G.N. (1996) Dieulafoy's disease. *Gastrointest Endosc Clin North Am* 6(4): 739–752.
- Gadenstätter, M., Wetscher, G., Crookes, P.F., Mason, R.J., Schwab, G. and Pointner, R. (1998)

- Dieulafoy's disease of the large and small bowel. *J Clin Gastroenterol* 27(2): 169–172.
- Goldenberg, S.P., DeLuca Jr, V.A. and Marignani, P. (1990) Endoscopic treatment of Dieulafoy's lesion of the duodenum. *Am J Gastroenterol* 85(4): 452–454.
- Iacopini, F., Petruzzello, L., Marchese, M., Larghi, A., Spada, C., Familiari, P. *et al.* (2007) Hemostasis of Dieulafoy's lesions by argon plasma coagulation. *Gastrointest Endosc* 66(1): 20–26.
- Juler, G.L., Labitzke, H.G., Lamb, R. and Allen, R. (1984) The pathogenesis of Dieulafoy's gastric erosion. *Am J Gastroenterol* 79(3): 195–200.
- Katsinelos, P., Paroutoglou, G., Mimidis, K., Beltsis, A., Papaziogas, B., Gelas, G. *et al.* (2005) Endoscopic treatment and follow-up of gastrointestinal Dieulafoy's lesions. *World J Gastroenterol* 11(38): 6022–6026.
- Katz, P.O. and Salas, L. (1993) Less frequent causes of upper gastrointestinal bleeding. *Gastroenterol Clin North Am* 22: 875–889.
- Kayali, Z., Sangchantr, W. and Matsumoto, B. (2000) Lower gastrointestinal bleeding secondary to Dieulafoy-like lesion of the rectum. *J Clin Gastroenterol* 30(3): 328–330.
- Marmo, R., Rotondano, G., Piscopo, R., Bianco, M., D'Angella, R. and Cipolleta, L. (2007) Dual therapy versus Monotherapy in the endoscopic treatment of high-risk bleeding ulcers: A meta-analysis of controlled trials. *Am J Gastroenterol* 102: 279–289.
- Nikolaidis, N., Zezos, P., Giouleme, O., Budas, K., Marakis, G., Paroutoglou, G. *et al.* (2001) Endoscopic band ligation of Dieulafoy-like lesions in the upper gastrointestinal tract. *Endoscopy* 33(9): 754–760.
- Norton, I.D., Petersen, B.T., Sorbi, D., Balm, R.K., Alexander, G.L. and Gostout, C.J. (1999) Management and long-term prognosis of Dieulafoy lesion. *Gastrointest Endosc* 50(6): 762–767.
- Nozoe, T., Kitamura, M., Matsumata, T. and Sugimachi, K. (1999) Dieulafoy-like lesions of colon and rectum in patients with chronic renal failure on long-term hemodialysis. *Hepatogastroenterology* 46(30): 3121–3123.
- Park, C.H., Sohn, Y.H., Lee, W.S., Joo, Y.E., Choi, S.K., Rew, J.S. *et al.* (2003) The usefulness of endoscopic hemoclippping for bleeding Dieulafoy lesions. *Endoscopy* 35(5): 388–392.
- Raju, G.S. and Gajula, L. (2004) Endoclips for GI endoscopy. *Gastrointest Endosc* 59(2): 267–279.
- Romãozinho, J.M., Pontes, J.M., Lérias, C., Ferreira, M. and Freitas, D. (2004) Dieulafoy's Lesion: management and long-term outcome. *Endoscopy* 36: 416–420.
- Savides, T.J. and Jensen, D.M. (2000) Therapeutic endoscopy for nonvariceal gastrointestinal bleeding. *Gastroenterol Clin North Am* 29(2): 465–487.
- Veldhuyzen-van-Zanten, S.J., Bartelsman, J.F., Schipper, M.E. and Tytgat, G.N. (1986) Recurrent massive hematemesis from Dieulafoy vascular malformations – a review of 101 cases. *Gut* 27: 213–222.
- Walmsley, R.S., Lee, Y.T. and Sung, J.J. (2005) Dieulafoy's lesion: a case series study. *World J Gastroenterol* 11(23): 3574–3577.
- Yamaguchi, Y., Yamato, T., Katsumi, N., Imao, Y., Aoki, K., Morita, Y. *et al.* (2003) Short-term and long-term benefits of endoscopic hemoclip application for Dieulafoy's lesion in the upper GI tract. *Gastrointest Endosc* 57(6): 653–656.

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