Research Paper Medical Science

Band Ligation in Bleeding Dieulafoylesions: A Retrospective Study

Kapil Sharma Department Of Anatomy, Smt. Kashibai Navale Medical College& general hospital to Department of Gastroenterology and Hepatology, Moti Lal Nehru Medical College ALLAHABAD UP INDIA

S P Misra Department Of Anatomy, Smt. Kashibai Navale Medical College& general hospital to Department of Gastroenterology and Hepatology, Moti Lal Nehru Medical College ALLAHABAD UP INDIA

Manisha Dwivedi Department Of Anatomy, Smt. Kashibai Navale Medical College& general hospital to Department of Gastroenterology and Hepatology, Moti Lal Nehru Medical College ALLAHABAD UP INDIA

ABSTRACT

Background:Dieulafoy was the first to characterize a gaping arteriole within the gastric mucosa causing massive hematemesis, designating it as "exulceratio simplex." A hundred years later, this vascular abnormality, now commonly referred to as a "Dieulafoy lesion. Endoscopic band ligation (EBL) has been mentioned as one of the inexpensive, easy to use, and effective modality of treatment for bleeding Dieulafoy lesions

Objective: To report our experience of endoscopic band ligation (EBL) for bleeding Dieulafoy lesions

Setting: A large teaching hospital

Methods - A retrospective case study of all patientswith bleedingDieulafoylesion in whom EBL was attempted from 2002 to 2007.We analyzed the demographic characteristics of the patients, risk factors for gastrointestinal bleeding, location of lesions and the recurrence of bleeding. We have also looked for feasibility of applying the band(s), cessation of bleeding following EBL and complications of the procedure, if any.

Results:There were 17 patients with this entity in the study group (males 12). The mean (SD) age of the patients was 59.6 (8.2) years. Comorbidity was present in 15 patients. All lesion were located in stomach. EBL could be performed and hemostasis was achieved in all patients. Two of the patients rebled. Hemoclipapplication achieve hemostasis in both. However, one patient rebled again and had to be operated. There was no complication of EBL.

Conclusions: EBL is feasible, safe, effective method and superior method for control of bleeding from with bleeding Dieulafoy lesion than adrenaline monotherapy.

KEYWORDS Dieulafoy's lesions (DL) and Endoscopic Band Ligation (EBL)

INTRODUCTION

In 1897, Paul Georges Dieulafoy, a professor of pathology at the Faculty of Medicine in Paris, France, was the first to describe a series of 10 patients who presented with massive hematemesis (approximately 4 L of blood in less than 24 hours) due to a bleeding gastric vessel, without any evidence of ulceration. At autopsy, a superficial ulceration with a gaping arteriole was found in the gastric submucosa. The lesion's borders were not hardened or projecting, and the remainder of the mucosa was in perfect health. Dieulafoy concluded that this lesion was not a typical gastric ulcer and named it an "exulceratio simplex," which in time became known as a "Dieulafoy lesion" [1]

Dieulafoy's lesion (DL), is now a well-recognized cause of non-variceal upper gastrointestinal bleeding (GIB) [1]. Previously published case series have found DL to account for 1-5.8% of cases of acute non-variceal upper GIB[2-4]. This lesion is defined by the presence of an abnormally thick arteriole (1-3 mm in diameter, 10 times higher than the diameter of sub mucosal capillaries at that level) that maintains the caliber of the feeding vessel when it reaches the mucous membrane [5]. Histologically, it is characterized by sub intimal fibrosis of the artery and a lack of inflammation at the edge of the mucosal defect, which sets it apart from peptic ulcers.

Though over a hundred years have passed since Dieulafoy first described this lesion, the mechanisms causing the tortuosity and the persistence of the large-sized submucosal arteries remain unknown. Many reports have attributedhis lesion to the pathological structure or the size of the artery with a persistent musculoelastic mantle of Wanke. Debate continues regarding the exact pathology and linkage of this artery to the overlying mucosa [6]. Further, what actually triggers their submucosal-to-mucosal rupture has yet to be proven.Several mechanisms have been proposed to account for the rupture and the subsequent massive haemorrhage. One theory suggests that the pulsations in a large submucosal vessel lead to disruption of the overlying epithelium. This leads to localise-dischaemia and exposure to bowel contents which ultimately result in erosion and rupture. [7] Another theory suggests that gastric wear and tear pro- motes thrombosis within the artery leading to the subsequent necrosis. [8]

It is also suggested that age-related mucosal atrophy might contribute to the process. The use of NSAIDs or alcohol with resultant mucosal injury has also been suggested but there is no con- sistent evidence to support this causal relationship. [7]

In a prospective study, Matsui et al., found that 40% of all causes of upper GIB were due to DL rather than gastroduodenal ulceration or varices[9].

DL is also a rare cause of bleeding from other parts of the gastrointestinal tract. The two largest retrospective series demonstrated that DL was the source of hemorrhage in 1.2-1.9% of all.[9,10].

Since 1986, endoscopy in addition to being the primary diagnostic tool has also become the first-line method of treatment [11]. Traditionally treated with a gastrotomy or gastrectomy, surgery is now reserved for the 4–8% of cases that do not achieve endoscopic haemostasis [12]. The three main forms of endoscopic treatment include (a) thermal electrocoagulation, heat probe coagulation, argon plasma coagulation, (b) regional injection-epinephrine (EPI) or norepinephrine (NOR) injection and sclerotherapy, and (c) mechanical banding and hemoclips [13].Advances in endoscopy have increased the detection rate of Dieulafoy's lesions and have significantly decreased the mortality from 80%[14] to 8.6% [15].Several studies have reported that EBL, one of these interventions, is inexpensive, easyto use, and as effective as bipolar coagulation or injection. [16,17]

A recent study by Alis et al. found that endoscopic band ligation (EBL) was associated with a significantly lower risk of recurrent bleeding as well as a shorter hospital stay when compared with sclerotherapy [12]. The mainstay of surgical treatment for endoscopic failures is wide wedge resection or local excision such as partial/wedge gastrectomy [18]. Simple oversewing of the lesion is not recommended, as it is associated with a greater risk of recurrent bleeding [18].

PATIENTS AND METHODS

This was a retrospective study of patients who were admitted to Department of Gastroenterology and Hepatology, Motilal Nehru Medical College, Allahabad, U. P., India with a diagnosis of gastrointestinal bleeding caused by DL between 2002 and 2007 in whom EBL was attempted. The diagnosis of bleeding Dieulafoy lesion was made when active arterial spurting or micropulsatile streaming was noticed for a minute from a < 3 mm mucosal defect, visualization of a vesselprotruding from a slight defect or normal mucosa, and/or a fresh blood clot adherent to a defect of normal mucosa. EBL was done by loading a preloaded elastic band cylinder on the tip of the upper gastrointestinal endoscope and the bleeding lesion was targeted, sucked in the barrel of the ligator using suction and the band(s) were fired to strangulate the bleeding lesion. We collected data regarding clinical presentation of the disease, diagnosis, demographic data, endoscopic finding, need of blood transfusion, presence of comorbidity and effectiveness of band ligation and rebleeding after EBL if any and their after any other rescue endotherapy or surgery resort to. We included cases in which endoscopy described a lesion compatible with Dieulafoy. We excluded patients who had other potentially bleeding lesions in other areas or had undergone other gastrointestinal endoscopic procedures. The ethics committee of our hospital approved the study.

RESULTS

There were 17 patients with this entity in the study group (males 12). The mean (SD) age of the patients was 59.6 (8.2) years.. Injection therapy with 1:10,000 dilute epinephrine had failed in all these patients. Comorbidities included diabetes mellitus in five, hypertension in four, cardiovascular diseases in three, renal disease in two and chronic bronchitis in one patient. Blood transfusion was required in seven patients who were hemodynamically unstable at the time of admission.

The lesion was located at the cardio-esophageal junction in one patient (Fig. 1), in the proximal stomach in 13 patients, and in the distal stomach in three patients. Injection therapy could not be applied satisfactorily in three of the 13 patients with proximal gastric lesions due to the position of the lesion and the patient with a bleeding lesion at the cardioesophageal junction. In the others there was continued bleeding after injection therapy, although the procedure was technically successful.

Bands could be placed in all the patients and the bleeding controlled in all (Fig. 2). A single band was required in 15 patients and two bands were needed in two patients. In all but two patients, the bleeding did not recur. In one patient, the bleeding recurred after 18 hours and she had a bout of hematemesis. After a good lavage of the stomach, emergency endoscopy revealed that the band had slipped and the lesion was bleeding actively. Two units of blood transfusion were required and emergency endoscopy was performed. Two hemoclips were applied to the lesion and the bleeding controlled (Fig. 3). There was no further bleeding.

In another patient, the bleeding recurred after 24 hours. Two hemoclips were applied and the bleeding controlled. No blood transfusion was required. However, there was further bleeding after 24 hours. The patient was transfused two units of whole blood and subjected to emergency surgery. Localized wedge resection of the area of the stomach was performed. Histopathological examination of the resected specimen showed a caliber-persistent artery with a mucosal defect, consistent with a Dieulafoy lesion (Fig. 4).

Complications

No complications of EBL was observed in any of the patients.

DISCUSSION

Dieulafoy lesion is a potentially life threatening cause of recurrent upper as well as lower gastrointestinal bleeding accounting for 0.5%-14% of cases of acute upper gastrointestinal hemorrhage[19]. The lesion consists of a large caliber, tortuous artery, 1 to 3 mm in diameter that lies in the submucosa, in close contact with the mucosa over a variable distance. The bleeding occurs from a erosion in the mucosa and the arterial wall. Typically they are located in the stomach, within 6 cm of the gastroesophageal junction and this site accounts for 60%-64% of cases. This is attributed to the architecture of the blood supply to the lesser curve of the stomach as the vessels arise. However, they can be found anywhere in the gastrointestinal tract.

Demographic characteristics of our patients were similar to those in other studies; we found a higher prevalence of the condition in men, compared to women, with a ratio of 12:5, and an average age of 59.6 years. Such strong male predominance in adults is perhaps hormonally related and can be attributed to the lack of estrogenic protective effects in males. It is also postulated that complex hormonal dysfunctions at the submucosal arteriole arcade are involved in the pathogenesis of the caliber persistent artery. Perhaps due to the older age of onset, comorbiditiesare present in up to 90% of patients, the most common including cardiovascular disease, hypertension, diabetesmellitus, liver disease, and renal failure [15] Some authors have proposed that these conditions alter the normal process of angiogenesis and trigger the formation of aberrant vessels [20].In our study,comorbidity was present in 15 out of 17 patients (88.23%); mainly diabetes (29.41), hypertension (23.52%) and cardiovascular diseases (17.64%). Most of the studies have shown that the most common location of DL is the stomach. In our series this was also the most common location as all the lesions were located into stomach.

Gastrointestinal bleeding caused by DL can be serious. In our study, 7 patients (41.17%) presented with symptoms of hemodynamic instability, and 12 (70.5 %) showed active bleeding at the moment of endoscopic exploration.

The success rate of endoscopic treatment in our study was high, similar to that reported in other studies [12,21]. We could achieve hemostasis in all the patients. One of the patients rebled and hemostasis could be achieved only after placement of hemoclips. Hemoclips have been found to be useful in arresting bleeding in patients bleeding from Dieulafoy lesions.However, in yet another patient, the bleeding recurred even after hemoclip application and the patient had to be operated. The histological section showed features typical of Dieulafoy lesion (Fig. 4).

Although the reis no consensus on the endoscopic treatment of choice but theoretically, the mechanical hemostasis leads to a smaller lesion of the surrounding tissue than thermal therapy or injection techniques, which sugge sts that these pro-

cedures could be a first-line approach forthe management of DL [22].

Limitations of our study were low sample size, retrospective design, lack of comparison with other modality of treatment and single centre study.

In conclusion,EBL is feasible, easy, safe and effective method for control of bleeding from with bleeding DL as primary hemostasis was achieved in all of our patients. In contrast, treatment with adrenaline monotherapy associated with a higher rate of failure and bleeding recurrence. EBL can applied to difficult DL lesions where injection therapy could not be applied satisfactorilydue to the position of the lesion.

For these reason, we can conclude that endoscopicbandligation is superior to adrenaline monotherapy for the treatment Dieulafoy lesions.

LEGEND TO FIGURES

Table 1 Demographic features of patients with bleeding Dieulafoy lesion

Table 1 Demographic data of the patients (n = 17)	
Age: median (range) (yr)	59.6 + 8.2
M:F	12:5
Comorbidities	
Diabetes	5
Hypertension	4
Cardiovascular disease	3
Renal failure	2
Chronic Bronchitis	1
Location of bleeding Dieulafoy lesions	
Proximal Stomach -	13
Distal Stomach -	3
Cardio-esophageal junction	1
Presentation	
Haemetemesis	12
Malena	5

Fig. A

1. Bleeding Dieulafoy lesion at the esophagogastricjuction.

2. A band has been placed on the bleeding Dieulafoy lesion and hemostasis achieved.

3. Hemoclips have been applied on the Dieulafoy lesion in the patient who rebled following band ligation. Hemostasis was achieved in this patient following clip application.

4. Histological examination of the resected specimen of stomach showing a typical large caliber persistent artery with mucosal defect (H & E X 40).

REFERENCES

EFERENCES | 1. Dieulafoy G. Exulceratio simplex: leçons 1–3. In: Dieulafoy G, editor. Clinique Médicale de l'HotelDieu de Paris. Paris, France: Masson etCie; 1898. pp. 1–38. | 2. Pointner R, Schwab G, Konigsrainer A, Dietze O. Endoscopic treatment of Dieulafoy's disease. Gastroenterology 1988; 94:563-566 | 3. Baettig B, Haecki W, Lammer F, Jost R. Dieulafoy's disease:endoscopic treatment and follow up. Gut 1993; 34: 1418-1421 | 4. Norton ID, Petersen BT, Sorbi D, Balm RK, Alexander GL,Gostout CJ. Management and long-term prognosis ofDieulafoy lesion. GastrointestEndosc 1999; 50: 762-767 | 5. Juler GL, Labitzke HG, Lamb R, Allen R. The pathogenesis of Dieulafoy's gastric erosion. Am J Gastroenterol1984; 79: 195-200 | 6. T. L. Miko and V. A. Thoma´ zy, "The caliber persistent artery of the stomach: a unifying approach to gastric aneurysm, Dieulafoy's lesion, and submucosal arterial malformation," Human Pathology, vol. 19, no. 8, pp. 914–921, 1988. | 7. Katsinelos P, Pilpilidis I, Paroutoglou G, Galanis I, TsolkasP , Fotiadis G, Kapelidis P , Georgiadou E, Baltagiannis S, Di- miropoulos S, Kamperis E, Koutras C. Dieulafoy-like lesion of the colon presenting with massive lower gastrointestinal bleeding. SurgEndosc2004; 18: 346 | 8. Chaer R, Helton WS. Dieulafoy's disease. Am CollSurg2003; 196: 290–6. | 9. Matsui S, Kamisako T, Kudo M, Inoue R. Endoscopic band ligation for control of nonvariceal upper GI hemorrhage: comparison with bipolar electrocoagulation. GastrointestEndosc 2002; 55: 214-218 | 10. Schmulewitz N, Baillie J. Dieulafoy lesions: a review of 6 years of experience at a tertiary referral center. Am J Gastroenterol 2001; 96: 1688-1694 | 11. M. M. Linhares, B. H. Filho, V. Schraibman et al., "Dieulafoy lesion: endoscopic and surgical management," Surgical Laparoscopy, Endoscopy and Percutaneous Techniques, vol. 16, no. 1, pp. 1–3, 2006. | 12. Alis H, Oner OZ, Kalayci MU, Dolay K, Kapan S, Soylu A, Aygun E. Is endoscopic band ligation superior to injection therapy for Dieulafoy lesion? SurgEndosc2009; 23: 1465-1469 | 13. M. Baxter and E. H. Aly, "Dieulafoy's lesion: current trends in diagnosis andmanagement," Annals of the Royal College of Surgeons of England, vol. 92, no. 7, pp. 548–554, 2010. | 14. Lee YT, Walmsley RS, Leong RW, Sung JJ. Dieulafoy's le- sion. GastrointestEndosc2003; 58: 236-243 | 15. Alshumrani G, Almuaikeel M. Angiographic findings and endovascular embolizationinDieulafoy disease: a case report and literature review. DiagnInterventRadiol 2006; 12: 151–4. | 16. Brown GR, Harford WV, Jones WF. Endoscopic band ligation of an activelybleeding Dieulafoy lesion. GastrointestEndosc. 1994;40:501-503. | 17. Mumtaz R, Shaukat M, Ramirez FC. Outcomes of endoscopic treatment ofgastroduodenalDieulafoy's lesion with rubber band ligation and thermal/injectiontherapy. J ClinGastroenterol. 2003;36:310-314. | 18. A. Hoffman, A. Kunert, A. Lahat, A. Volkov, O. Zmora, and D. Rosin, "Laparoscopic resection of gastric dieulafoy lesion following preoperative tattooing," Israel Medical Association Journal, vol. 13, no. 3, pp. 187–188, 2011. | 19. Stark ME, Gostout CJ, Balm RK. Clinical features and endoscopic management of Dieulafoy's disease. GastrointestEndosc 1992; 38: 545-550 | 20. Ding YJ, Zhao L, Liu J, Luo HS. Clinical and endoscopicanalysis of gastric Dieulafoy's lesion. World J Gastroenterol2010; 16: 631-635 | 21. Cheng CL, Liu NJ, Lee CS, Chen PC, Ho YP, Tang JH, Yang C, Sung KF, Lin CH, Chiu CT. Endoscopic management of Dieulafoy lesions in acute nonvariceal upper gastrointestinal bleeding. Dig Dis Sci2004; 49: 1139-1144 | 22. Nikolaidis N, Zezos P, Giouleme O, Budas K, Marakis G, Paroutoglou G, Eugenidis N. Endoscopic band ligation of Dieulafoy-like lesions in the upper gastrointestinal tract. Endoscopy 2001; 33: 754-760