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Angiodysplasias of the Small Intestine: What is the Contribution of Video-Capsule Endoscopy?

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Abstract **Original Research Article**

***Introduction*:** Most angiodysplasias are found in the small bowel and are responsible for 50-60% of gastrointestinal bleeding and iron-deficiency anemia, particularly in patients aged over 60 years. The aim of this study is to evaluate the contribution of VCE in the diagnosis of angiodysplasia in patients with unexplained iron-deficiency anemia. ***Materials and Methods*:** This is a descriptive monocentric study from June 2018 to June 2024, including patients referred for unexplained iron deficiency anemia without gastrointestinal bleeding and explored by VCE type PillCam® SB3 and Capsocam. All our patients underwent a clinico-biological examination, upper and lower endoscopy with biopsies, for which the results were negative. ***Results*:** From a total of 161 patients who underwent VCE; 50 (31,05 %) were referred forf evaluation of unexplained iron deficiency anemia. the average age was 56.21 years, with a female predominance (sex ratio: 1.4). 42% of patients were hypertensive, 32 % were diabetic, 24 % were taking non-steroidal anti-inflammatory drugs (NSAIDs), 4% had Crohn's disease, 2 % had celiac disease and 2% had portal hypertension. 18 % of patients had capsule retention factors, dominated by abdominopelvic surgery in 14,57 % of cases. the mean hemoglobin level was 6.9 g/dl (range 3 – 10 g/dL). The mean ferritin level was 5,1 ng/dL (range 1.5 – 16 ng/dL). VCE found vascular lesions in 70 % of cases, dominated by angiodysplasias in 58 % of cases, red spots were noted in 4 cases (8.3%), phlebectasias in 3 cases (6.25%). We also reported 1 case of vascular ectasia, small intestine varices and portal hypertension enteropathy. It's important to note that a patient may present with several types of lesions. The distribution of lesions according to location was duodenal in 19% of cases, jejunal in 51% of cases, ileal in 30% of cases. ***Conclusion*:** according to our study, female gender, elderly age and low hemoglobin levels probably increase the risk of angiodysplasia diagnosis.

Keywords: Angiodysplasia, Iron Deficiency Anemia, Small Bowel.

BACKGROUND

Angiodysplasias are the most common vascular lesions in the gastrointestinal tract.

Most angiodysplasias are found in the small bowel and are responsible for 50-60% of gastrointestinal bleeding and iron-deficiency anemia, particularly in patients aged over 60 years.

Diagnosis and treatment of angiodysplasias, particularly those in the small intestine, is a major challenge, due to the insidious nature of the disease, the inaccessibility of the affected sites and the limitations of available diagnostic procedures, giving rise to the value of VCE [1].

The aim of this study is to evaluate the contribution of VCE in the diagnosis of angiodysplasia in patients with unexplained iron-deficiency anemia.

MATERIALS AND METHODS

This is a descriptive monocentric study from June 2018 to June 2024, including patients referred for unexplained iron deficiency anemia without gastrointestinal bleeding and explored by VCE type PillCam® SB3 and Capsocam SV-1. All our patients underwent a clinico-biological examination, upper and lower endoscopy with biopsies, for which the results did not explain the origin of the anemia. The preparation used was PEG (2 L the day before and 0.5 L after ingestion of the capsule) with clear broth the day before the examination and 10 days' discontinuation of oral iron if taken.

Data were collected from the VCE registry, patient medical records, and VCE interpretation software.

RESULTS

From a total of 161 patients who underwent VCE, 50 (31,05 %) were referred for evaluation of unexplained iron deficiency anemia. the average age was 56.21 years, with a female predominance (sex ratio: 1.4).

42% of patients were hypertensive, 32 % were diabetic, 24 % were taking non-steroidal anti-inflammatory drugs (NSAIDs), 4% had Crohn's disease, 2 % had celiac disease and 2% had portal hypertension. 18 % of patients had capsule retention factors, dominated by abdominopelvic surgery in 14 % of cases and Crohn's disease in 4% of cases.

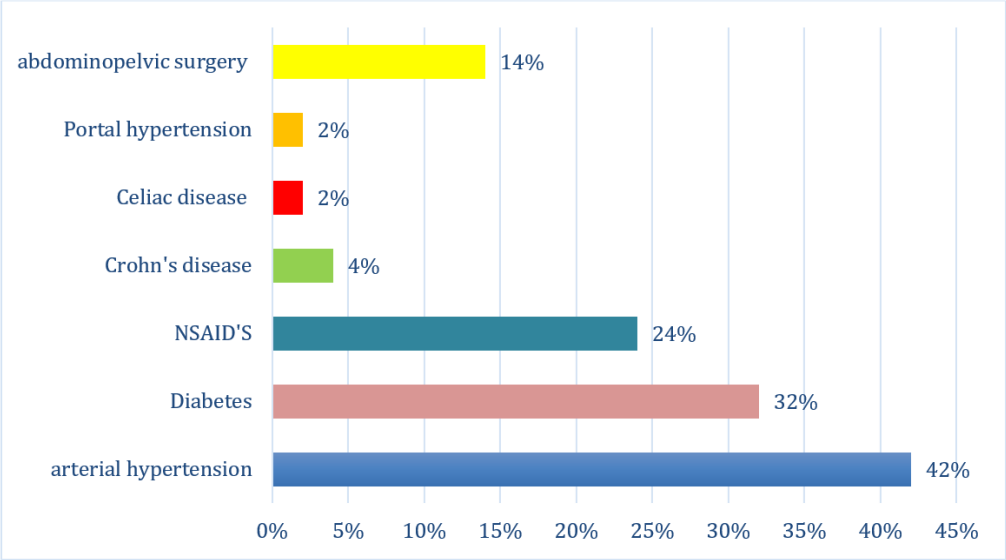

Figure 1: Comorbidities of patients

The mean hemoglobin level was 6.9 g/dl (range 3 – 10 g/dL). The mean ferritin level was 5,1 ng/dL (range 1.5 – 16 ng/dL). The average time between the start of symptomatology and the performance of VCE was 35 months, with extremes ranging from 2 months to 15 years.

VCE found vascular lesions in 70 % of cases, dominated by angiodysplasias (Figure 4) in 58% of cases, the location of which was duodenal in 8 cases (27,58%), jejunal in 14 cases (48,27%) and ileal in 7 cases (24,13%). Red spots were noted in 4 cases (8%), Phlebectasis was noted in 3 cases (6%).

We also reported 1 case of vascular ectasia, small bowel varices and portal hypertension enteropathy. It's important to note that a patient may present with several types of lesions.

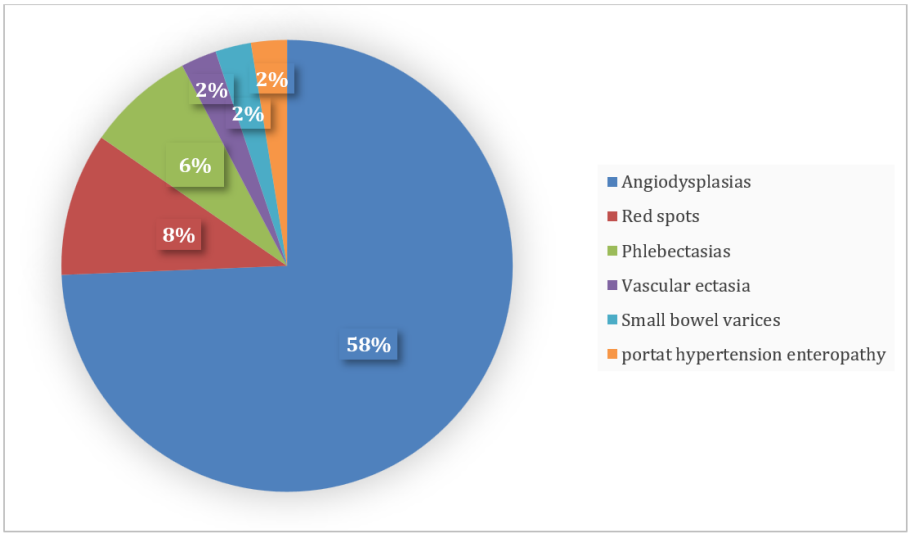

Figure 2: Distribution of vascular lesions

The distribution of vascular lesions according to location was duodenal in 19% of cases, jejunal in 51% of cases, ileal in 30% of cases.

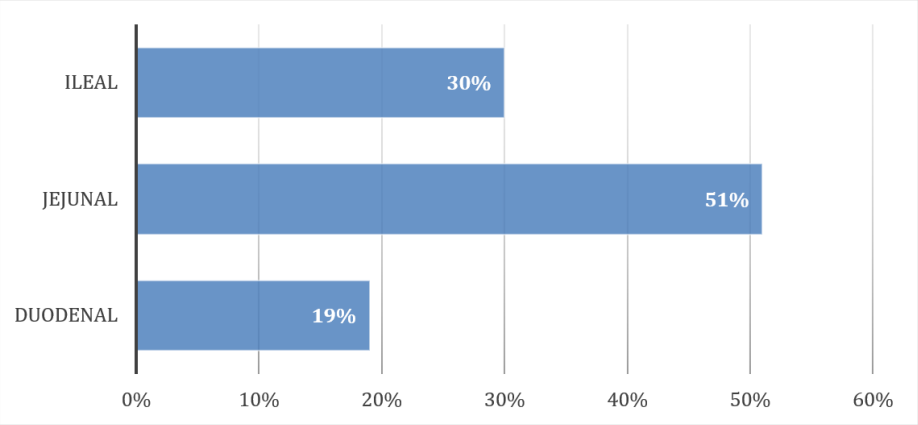

Figure 3: Location of vascular lesions of the small bowel

Other lesions in addition to angiodysplasia were noted: inflammatory and ulcerative lesions in 22% of cases, tumoral lesions in 16% of cases.

Lesions detected at VCE were classified according to their bleeding potential, based on Saurin's classification: Lesions of none or incertain imputabilitý (P0/P1) in 38 % of cases and Lesions of high imputabilitý (P2) in 62% of cases.

Lesions outside the small intestine were gastric angiodysplasia (Figure 5) in 16% of cases and cecal angiodysplasia in 4%.

Thus, the diagnostic yield of VCE in diagnosis of angiodysplasia was 58%.

Figure 4: Small bowel angiodysplasia

Figure 5: Gastric angiodysplasia

Figure 6: Cecal angiodysplasia

DISCUSSION

Angiodysplasia is characterized by abnormal, tortuous, and dilated small blood vessels located in the mucosal and submucosal layers of the gastrointestinal tract [1]. On direct visualization via endoscopy or colonoscopy, angiodysplasia appears as 5 to 10 mm flat, cherry-red, fern-like projecting vessels originating from a central artery [2, 3].

Although the mechanism of angiodysplasia is unclear, the pathophysiology of their formation is subject to several hypotheses, but they are generally associated with aging of the intestinal wall, either through hypoxia or increased intestinal wall tension [3, 4]. This results in the appearance of thin, friable blood vessels devoid of smooth muscle tissue, making them vulnerable to repetitive bleeding.

Before the 2000s, the detection of angiodysplasia was very difficult, since the available diagnostic procedures [scintigraphy, simple angiography, computed tomography (CT), magnetic resonance imaging (MRI)] had low sensitivity and specificity [5, 6]. In the last decade, with the introduction of VCE, the detection of angiodysplasia as the cause of gastro-intestinal bleeding has increased [7, 8].

The prevalence of angiodysplasia increases with age. In patients over 50, small bowel angiodysplasia is the most common cause of gastro-intestinal bleeding [9, 10]. In our study the average age was 56.21 years.

Angiodysplasias are responsible for 50-60% of cases of gastrointestinal bleeding and unexplained iron-deficiency anemia [11]. In a study of 120 cases by Olano *et al.*, [12], angiodysplasia was diagnosed in 45% of patients, which is consistent with the finding in our series that 58% of patients had angiodysplasia.

In our series, in addition to angiodysplasia, 3 cases of phlebectasis were included as vascular lesions responsible for occult digestive bleeding and iron-deficiency anemia, which is in line with the results of the study by Olano *et al.*, [12], who found 2 cases of phlebectasis.

Angiodysplasias are more frequent in the jejunum than in the ileum, and 60% of patients have more

than one location [13, 12]. In our series, the jejunal location was the most frequent.

The "Saurin classification of small-bowel lesions on capsule endoscopy (CE)" is used to stratify patients based on risk levels. Highly relevant lesions (P2) had previously been validated by two blinded endoscopists in 100% of cases, compared with 73% and 27% of cases for intermediate- (P1) and low-relevance (P0) lesions, respectively. There was a necessity for therapy in a significantly higher number of P2 lesions (61%), compared with P1 or P0 lesions (23 %) [11]. In our study 62% of lesions were considered to be highly relevant lesions (P2) which is consistent with the literature.

Treating bleeding small bowel angiodysplasias is more challenging than addressing gastric or colonic angiodysplasias due to their inaccessibility. Gastrointestinal bleeding (GIB) from angiodysplasias often poses a significant therapeutic challenge, as there are no established treatment guidelines, resulting in considerable variability in patient management [14, 15].

Complementary high and/or low approach enteroscopy, with or without biopsies and therapeutic procedures, remains essential in managing patients whose VCE has identified the location and appearance of small bowel lesions particularly vascular lesions [16].

CONCLUSION

Video Capsule Endoscopy (VCE) is now considered the method of choice for diagnosing pathologies of the small intestine, thanks to its high diagnostic yield, accuracy and safety profile. In the literature, the main etiologies of unexplained iron-deficiency anemia of digestive origin are dominated by angiodysplasias, which is according to our results.

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