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CASE REPORT

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Inflammatory Fibroid Polyp of the Small Intestine: a Case Report and Systematic Literature Review

Nikola Ivaniš[1], Vera Tomas[2], Luka Vranić[3], Franjo Lovasić[2], Viktor Ivaniš[4], Marinko Žulj[5], Ramadan Šuke[1], Davor Štimac[3]

1) Private Medical Centre Rijeka, Polyclinic Ivaniš, Rijeka;
2) Department of Anesthesiology and Intensive Care Unit, Clinical Hospital Centre Rijeka, Rijeka;
3) Department of Gastroenterology, Clinical Hospital Centre Rijeka, Faculty of Medicine, University of Rijeka, Rijeka;
4) Thalassotherapia Opatija, Opatija;
5) Faculty of Dental Medicine and Health Osijek, University of Osijek, Croatia

Address for correspondence:
Davor Štimac
Department of Gastroenterology, Clinical Hospital Centre Rijeka, Faculty of Medicine, University of Rijeka, Rijeka, Croatia
davor.stimac7@gmail.com

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ABSTRACT

Aim: Starting from a case presentation, this review aims to present literature data on inflammatory fibroid polyps (IFPs) of the small intestine.
Methods: Case report and systematic review. A comprehensive systematic review of English literature using PubMed was conducted, based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The used key words were: "inflammatory fibroid polyp" or "Vanek", including only cases with IFPs localized of the small intestine, published from 1976 to 2019.
Results: We present a case of a 38-year old patient with intestinal IFP presenting with acute abdomen due to intussusception diagnosed with ultrasound (US) based on a target sign and visible solid tumor in the small intestine leading to prompt surgical treatment. A diagnosis of IFP was made based on the pathohistological findings. Moreover, a systematic review of small intestine IFPs was conducted which is, to our knowledge, the first comprehensive systematic literature review on this topic. The analysis included 53 case reports or case series concerning 77 cases of small bowel IFPs. The patients were aged from 4 to 75 years (average 45.2), with a female predominance (59.7%). The most common localization was the ileum in 77.9% cases, followed by the jejunum (13%) and the duodenum (6.5%). The most common clinical presentation was abdominal pain due to intussusception (63.6%). Regarding diagnostic methods, computed tomography (CT) was frequently used as primary diagnostic method (26%) followed by exploratory laparotomy (16.9%), endoscopy (7.8%) and US (6.5%). Combination of US and CT contributed to the diagnosis in 9.1% of cases. The majority of cases were treated surgically (92.21%), while only a minority benefited of minimally invasive techniques such as endoscopy.
Conclusions: Small bowel IFPs, ones of the least common benign tumors, are characterized by variable clinical signs and symptoms and can potentially lead to serious consequences for the patient.

Key words: inflammatory fibroid polyp – small intestine – intussusception.

Abbreviations: CT: computed tomography; GI: gastrointestinal; IFP: inflammatory fibroid polyp; PDGFRA: platelet derived growth factor alpha; US: ultrasound.

INTRODUCTION

Inflammatory fibroid polyp (IFP), also known as Vanek's tumor, is one of the least common benign tumors of the gastrointestinal (GI) tract. It was first described in 1949 by Vanek [1] while the name IFP was proposed by Helwig and Ranier in 1953 [2, 3]. Even though IFPs can appear anywhere in the GI tract, the most common location is the gastric antrum and the ileum. The peak incidence is in the fifth and seventh decade, with a slight predominance in men [4]. Morphologic features of these tumors often vary, but their molecular pathogenesis has been well characterized. The majority of IFPs are found as solitary polyps, with an average diameter of 3 to 4 cm, at the time of diagnosis. Many pathogenetic mechanisms have been put forward, such as metabolic, physical and chemical. However, after a recent discovery of platelet derived growth factor alpha (PDGFRA) mutations in these tumors [5], it became apparent that IFPs are true neoplasms, not as it was supposed reactive polyps, and their formation is triggered by activating mutations in the mentioned gene [6 ,7]. Clinical presentation depends both on the size and location of IFPs and can include acute or chronic abdominal pain, altered

bowel habits, diarrhea, vomiting, GI bleeding and weight loss. Most gastric and colonic IFPs are asymptomatic; however, intestinal lesions can often present as intussusception [8]. Computed tomography (CT) is the most sensitive diagnostic method for mesenchymal GI tumors and can be used for suspected intussusception. Both colonic and gastric IFPs can be endoscopically diagnosed and removed, while intestinal IFPs are usually treated surgically especially when they present as acute abdomen [4].

We report a case of intestinal IFP presenting as acute abdomen due to intussusception. In addition, a systematic search was conducted in order to present the current knowledge of the IFPs of the small intestine reviewing demographic characteristics, clinical presentation, diagnosis and treatment.

CASE REPORT

A 38-year old patient presented in emergency department with complaints of abdominal pain located in the right hemiabdomen. First symptoms occurred 3 days prior to the presentation. The pain was initially generalized, increased post alimentary, subsequently with diarrhea. The patient was advised by the primary health care doctor to take analgesics and rehydrating solutions. Prior to arriving in emergency, the pain suddenly worsened in intensity from 3 to 8 on the analogue visual scale (one being no pain and 10 being the most intensive pain possible). An oral analgesic was taken before presenting to emergency, without effect. The patient denied any episode of nausea, vomiting and melena during the course of illness. There was no history of weight loss, though he complained of loss of appetite. Patient had an unremarkable drug, family or psychosocial history including smoking status and no history of previous GI illness.

On physical examination, the patient was afebrile, with abdominal tenderness on right hemiabdomen palpation, with rebound tenderness in the right iliac fossa and positive psoas sign. The Rovsing's sign was negative. The laboratory results were within the reference values. The chest radiography was normal, while abdomen radiography detected few air-fluid levels without signs of bowel distension.

The patient underwent a detailed ultrasound (US) examination that detected in the right lower quadrant of abdomen, the thickening of the intestinal wall of the small intestine with "target sign"; a solid tumor was clearly visible in the reported segment. Based on these findings the diagnosis of small bowel tumor with intussusception was made. Due to the severity of the pain refractory to analgesic opioid therapy, and to the US finding of target sign with solid tumor, the decision was made to perform urgent explorative laparotomy. During surgery, segmental resection of the small intestine, including a 3.5 cm long polypoid tumor, was made. The pathohistological analysis of the resected tumor revealed an inflammatory fibroid polyp of a the small intestine. The patient postoperative recovery was uneventful. Postoperatively the patient was relieved from pain. In the following weeks after surgery the bowel habits normalized. At two-year follow-up the patient is without abdominal complains.

REVIEW OF THE LITERATURE

The medical literature included in the systematic review was searched using the PubMed medical database. It included English-only literature, published between 1976 and 2019. A paper search was performed based on Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Fig. 1).

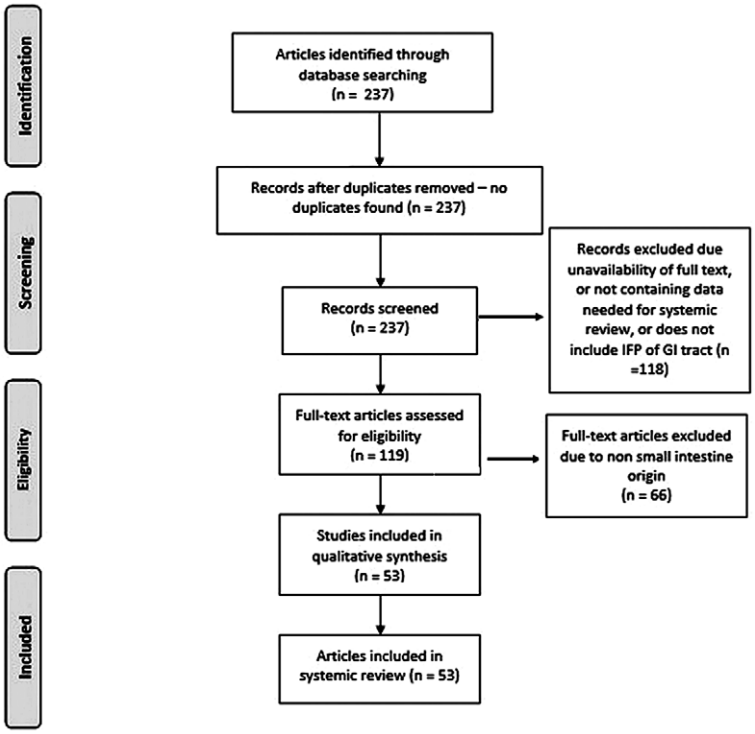

Fig. 1. PRISMA flow diagram of the article selection process.

The search strategy included the terms "inflammatory fibroid polyp" or "Vanek", with filters: humans and English-only, and included only cases of IFP in the small intestine, to be more precise, the duodenum, jejunum and ileum. After a preliminary literature search, 237 articles were identified. Finally, the systematic review included a total of 53 case reports or case series, concerning 77 cases of IFPs localized in small intestine, published from 1976 to 2019. We collected the following data: age, gender, clinical presentation, location, tumor size, diagnostic tool and treatment. All articles that contain insufficient clinical and/or demographical data were excluded.

RESULTS

A total of 53 case reports or series concerning 77 cases of patients with IFPs of a small intestine were included in this review according to the aforementioned criteria. The main data systematically collected are presented in Supplementary Table I.

During analysis it was found that patients were aged from 4 to 75 years (average 45.2) and the majority of reported patients were female (59.7%). The most common localization of IFPs in small intestine was the ileum (77.9% cases) [9-47], followed by the jejunum (13%) [34, 48-55] and the duodenum (6.5%) [46, 56-59]. In 2.6% cases IFP was found in the ileal pouch [60, 61]. The most common clinical presentation was abdominal pain due to intussusception (63.6%) [9-13, 16, 19, 21-23, 25, 26, 29, 30, 32, 34-38, 40-43, 45-49, 53-55].

Regarding diagnostic methods, CT was frequently used as the primary diagnostic method (26%) [9, 10, 12, 13, 15-17, 23, 24, 27, 28, 30, 35, 48, 49, 51, 53] followed by exploratory laparotomy (16,9%) [14, 29, 39, 46, 47, 54], endoscopy (7,8%) [22, 31, 38, 56, 58, 61] and US (6.5%) [21, 41, 42, 44, 52]. Combination of US and CT contributed to the diagnosis in 9.1% of cases [11, 20, 26, 32, 34, 37]. Only in two case reports the diagnostic tool was not specified [33, 45]. Small intestine IFPs were in the majority of cases treated surgically (92.21%), while only a minority were treated by minimally invasive techniques such as endoscopy.

DISCUSSION

Inflammatory fibroid polyps are rare, benign neoplastic lesions originating in the submucosa that arise through the GI tract. The precise etiopathogenesis remains still unknown. Several hypotheses were suggested about triggers that cause the formation of IFPs. It has been speculated that IFPs are a consequence of a chronic irritation or inflammation. Other authors suggested a possible relation with localized eosinophilic infiltration, since IFPs are characterized by predominate eosinophilic infiltrates [4]. Several cases have associated these lesions with Crohn's disease [30, 33, 62]. The discovery of PDGFRA mutations in IFPs in 2008 confirmed the neoplastic nature of these tumors. Among the case series, the frequency of mutations varies from 21.7% to 69.6% [4, 5].

Inflammatory fibroid polyps originate from submucosa and are characterized by vascular and fibroblast proliferation with inflammatory response. The inflammatory infiltration includes dominantly eosinophils. IFPs are composed of mononuclear, spindle-shaped cells arranged in whorls or in an onion skin like fashion around mucosal glands and capillaries. The matrix can be collagen rich or consist of fine fibrillar collagen. Macroscopically, IFPs can be peduncular or sessile varying from 0.2 to 20 cm in diameter [4, 63-65]. Immunohistochemically, IFPs are positive for smooth muscle actin, CD68 and CD34 and negative for S100 protein, CD117 and cytokeratin AE1/AE2. On the other hand, gastrointestinal stromal tumors (GISTs) are positive for CD117, schwannomas for S100 protein and inflammatory myofibroblastic tumors are negative for CD34 [8, 66]. The distinction to GISTs is based on different morphology and clinical behavior, although both lesions frequently have PDGFRA mutations [7].

Inflammatory fibroid polyps can appear through the whole GI tract. The most common site is the gastric antrum (66-75%), followed by the small intestine, mainly the ileum (18-20%), colorectal region (4-7%), gallbladder (1%), esophagus (1%) and appendix (<1%) [21, 67, 68].

Clinical presentation of IFPs depends mostly on location in the GI tract and their size. Patients with IFPs are usually asymptomatic and remain undiagnosed or IFPs are accidental findings during endoscopy or laparotomy procedures performed for another reasons. In case of gastric IFPs, chronic or mild abdominal pain is the most prominent symptom. Small intestine IFPs can present as severe acute abdominal pain, often due to intussusception, as revealed by our systemic review. However, most common clinical presentation of intestinal IFPs is occasional chronic colic-like abdominal pain, due to partial obstruction of the small intestine [4, 21, 69]. Other symptoms, such as chronic diarrhea, vomiting, alterations in bowel habits, tenesmus, GI bleeding, anemia or weight loss are less frequent [21, 70].

Diagnosing IFP can be challenging due to the nonspecific clinical presentation, highly dependent on the lesion site. It is based on medical history, physical examination and specific procedures such as X-ray, abdominal US, CT, magnetic resonance imaging (MRI), enteroclysis, endoscopy, video capsule procedure and angiography [4, 21]. In severe clinical presentation or when intussusception is suspected but not confirmed by preoperative workup, diagnostic laparoscopy is needed to confirm the diagnosis. Exploratory laparotomy might also be indicated but diagnostic laparoscopy is less traumatic [4,71].

Abdominal X-ray is usually the first diagnostic method since most of the patients present with obstructive abdominal symptoms, but rarely establishes the diagnosis [72, 73]. Enteroclysis was the gold standard for diagnosing intussusception until mid-1980. Although it has high sensitivity and specificity for both intraluminal masses and small mucosal lesions, nowadays it is rarely used due to its invasive nature [4, 21]. At present, US is regarded as the primary imaging modality to diagnose intraabdominal masses, because it is noninvasive and widely accessible. Intussusception, the common, yet serious clinical presentation of IFPs, can be diagnosed or excluded with US with a sensitivity of 98-100%, a specificity of 88% and a negative predictive value of 100%. Classical imaging appearances of intussusception would be the target or doughnut sign in the transverse view and sandwich, pseudokidney or hayfork sign in the longitudinal view. However, meteorism and

obesity can limit the diagnostic accuracy [4, 74, 75]. Abdominal CT, unaffected by the gas presence, is considered the most sensitive method to diagnose intussusception with a diagnostic accuracy of 58-100% [21, 76]. Pathognomonic intussusception appearance is bowel-within-bowel configuration suggested by vessels and mesenteric fat compressed between the small intestine walls. Therefore, it is recommended to perform CT as a routine diagnostic measure in patients presenting with intestinal obstruction [21, 77]. Magnetic resonance imaging, not routinely performed in the patients with intestinal obstruction due to the price and to the scanning duration, can contribute to the diagnosis. Beall et al. [75] demonstrated that the cause of intestinal obstruction was correctly diagnosed by CT in 71% and by MRI in 95% of cases. The sensitivity, specificity and accuracy for helical CT in their report was 71%, 71% and 71% as compared to 95%, 100% and 96% for MRI [4, 75].

Inflammatory fibroid polyps can be diagnosed and treated with endoscopy, such as gastroscopy and colonoscopy, primarily when gastric or colonic involvement of IFP is suspected. Intussusception can be visualized during colonoscopy as an intraluminal mass directed centrally and distally, but such a diagnosis is rarely made [21, 75]. Capsule endoscopy and double-balloon endoscopy are novel endoscopic methods for small intestine examination. Obstructive symptoms are a contraindication for capsule endoscopy, but it can be useful in cases with long-lasting abdominal pain with negative results on other endoscopic and radiologic exams. Double-balloon endoscopy can be used to examine 70-150 cm of the small intestine, but its usage is limited [4]. Most IFPs can be endoscopically removed using endoscopic submucosal dissection [4, 78]. Inflammatory fibroid polyps are considered benign and rarely recur or metastasize. Therefore, further diagnostics and follow up are not recommended. However, recently three case reports have been published that showed the invasion of IFP through the muscularis propria layer, one in the ileum [79] and two in the stomach [66, 80].

Small bowel IFPs are primarily treated surgically, as shown in our systematic review in 92.21% of cases. The surgical treatment is not recommended unless the tumor is symptomatic. Exploratory laparoscopy or laparotomy are first choices in cases of intussusception. In case of complete bowel obstruction, the surgical treatment should be performed as soon as possible in order to prevent the development of ischemia, necrosis and possible subsequent perforation of invaginated bowel segment.

CONCLUSIONS

This analysis of small intestine IFPs, to our knowledge, is the first comprehensive systematic literature review emphasizing that despite their benign nature, intestinal IFPs are characterized by the variability of the clinical signs and symptoms and can potentially lead to serious consequences for the patient.

Conflicts of interest: None to declare.

Authors' contributions: N.I. conceived and designed the study and drafted the manuscript. V.I., V.T. and L.V. searched the literature, analyzed the data, drafted the manuscript. F.L., R.S. and M.Z. critically revised the manuscript. D.S. supervised the study, critically revised the paper and approved the final version.

Supplementary material: To access the supplementary material visit the online version of the *J Gastrointestin Liver Dis* at http://dx.doi.org/10.15403/jgld-2417

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