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The primary aim of *World Journal of Gastrointestinal Surgery* (WJGS, *World J Gastrointest Surg*) is to provide scholars and readers from various fields of gastrointestinal surgery with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGS mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal surgery and covering a wide range of topics including biliary tract surgical procedures, biliopancreatic diversion, colectomy, esophagectomy, esophagostomy, pancreas transplantation, and pancreatectomy, etc.

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Intestinal perforation with abdominal abscess caused by extramedullary plasmacytoma of small intestine: A case report and literature review

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Abstract

BACKGROUND

Extramedullary plasmacytoma (EMP) of the gastrointestinal tract is an extremely rare disease. Clinical manifestations of EMPs are varied and depend on the location and progression of the tumor.

CASE SUMMARY

Here, we firstly report a case of intestinal perforation with abdominal abscess caused by EMP of the small intestine in a 55-year-old female patient. The patient received emergency surgery immediately after the necessary preoperative procedures. During the operation, EMP was found to have caused the perforation of the small intestine and the formation of multiple abscesses in the abdominal cavity. Partial resection of the small intestine with peritoneal irrigation and drainage was performed. EMP was finally confirmed by postoperative histopathology and laboratory tests. Additionally, we performed a literature review of gastrointestinal EMP to obtain a deeper understanding of this disease.

CONCLUSION

EMP of the small intestine may have spontaneous perforation, which requires emergency surgery. Surgical resection can obtain good therapeutic effects.

Key Words: Extramedullary plasmacytoma; Perforation; Small intestine; Gastrointestinal tract; Treatment; Case report

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Core Tip: Extramedullary plasmacytoma (EMP) of the gastrointestinal tract is an extremely rare disease, accounting for only 7% of all EMPs. Clinical manifestations of EMPs are varied and depend on the location and progression of the tumor. Here, we firstly report a case of intestinal perforation with abdominal abscess caused by EMP of the small intestine in a 55-year-old female patient. Additionally, we discussed the diagnosis and treatment of gastrointestinal EMP after a review of the literature worldwide to provide an overview of this disease.

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INTRODUCTION

Plasmacytoma is a malignant tumor that originates from bone marrow hematopoietic tissue. It is characterized by an imbalance in the monoclonal proliferation of plasma cells. Extramedullary plasmacytoma (EMP) refers to a localized monoclonal plasma cell proliferation that occurs in soft tissues without bone marrow involvement. It is a rare type of malignant monoclonal plasma cell lesion, accounting for approximately 2%-3% of all plasmacytomas[1,2]. Plasmacytoma primarily occurs in the upper respiratory tract but is rarely found in the gastrointestinal tract. Gastrointestinal EMP only accounts for approximately 7% of all EMPs[3]. EMP is found in all parts of the gastrointestinal tract, including the small intestine[4-7]. Clinical manifestations of gastrointestinal EMPs vary with the location and progression of the tumor and lack specificity. Common clinical manifestations include abdominal pain, abdominal discomfort, changes in bowel habits, gastrointestinal bleeding and intestinal obstruction[8-12]. However, there are no reports of spontaneous perforation and abdominal abscess caused by EMP of the small intestine. Reports on EMP of the small intestine are mostly single case reports, and most of the patients underwent routine surgery[7,13]. It is rare to find this disease during an emergency surgery. In this paper, we firstly present a case of intestinal perforation with abdominal abscess caused by EMP of the small intestine and review the relevant literature from PubMed.

CASE PRESENTATION

Chief complaints

A 55-year-old female was admitted to the Department of Emergency of our hospital with sudden abdominal pain and abdominal distension.

History of present illness

The patient's symptoms started 3 d prior and were accompanied by nausea and vomiting without gas or defecation. Since onset, the patient had a loss of appetite, limited diet, poor sleep and decreased urination. No significant change in body weight was noted.

History of past illness

The patient's previous medical history was not remarkable. She and her family had no history of multiple myeloma (MM) or other gastrointestinal diseases.

Personal and family history

The patient has no personal and family history.

Physical examination

During physical examination, the patient had a normal heart rate and mild hypotension. The patient's abdomen was slightly distended, and the abdominal tenderness was more severe in the left upper abdomen accompanied by rebound pain and muscle tension.

Laboratory examinations

Laboratory tests showed the following: White blood cells $10.5 \times 10^9/L$, neutrocyte (NE) $9.63 \times 10^9/L$, NE% 91.7%, hemoglobin 108 g/L, and platelet $330 \times 10^9/L$. Liver and kidney function were normal.

Imaging examinations

Enhanced computed tomography (CT) showed that the small intestinal lumen in the upper left abdomen was dilated with gas and fluid accumulation, and showed multiple fluid-gas level changes were noted. The intestinal wall was edematous and thickened, and the density of the surrounding fat interspace had increased. Small air bubbles were scattered under the left diaphragm, and multiple encapsulated effusions were observed between the small intestines. These imaging findings suggested local perforation and multiple abscesses in the abdominal cavity (Figure 1).

FINAL DIAGNOSIS

Microscopic analysis showed that the pathological specimen displayed a large number of neoplastic plasma cells with inflammatory cell infiltration (Figure 2A). These plasma cells were positive for CD38 (+), CD138 (+), kappa (+), lambda (week+), CD79a (week+), and MUM1 (+) and negative for creatine kinase (-), CD117 (-), Dog-1 (-), S-100 (-), B cell lymphoma-2 (-), beta-catenin (-), CD56 (-), immunoglobulin G4 (-) and Pax-5 (-) with a Ki-67 proliferative index of 10% (Figures 2B-F). The final pathological specimens were highly suspicious of plasmacytoma. Postoperative laboratory tests showed that the bone marrow cytology was normal and no abnormal monoclonal plasma cells were detected in the flow cytometric analysis. Urine free light chain and serum immunofixation electrophoresis were also normal. Lytic lesions were not found on X-rays. Therefore, the final diagnosis of this patient was primary EMP of the small intestine.

TREATMENT

Considering that the patient may have a perforation of the digestive tract, we performed emergency surgery. During the operation, we found that the small intestinal serosa 100 cm away from the Treitz ligament had a dark-red polyp-like protrusion with a perforation approximately 0.5 cm in diameter at the top. The local intestinal wall was hyperemic, edematous and thickened, and the surface of the surrounding small intestine and lateral peritoneum was covered with many purulent masses (Figure 3). Several abscesses were observed between the left paracolic groove and small intestine and filled with a yellow, turbid fluid. After the abscesses were removed, the abdominal cavity was flushed with a large amount of warm normal saline. Then, a segment of the jejunum 33 cm in length was resected, and a primary side-to-end anastomosis of the small intestine was performed. The lumen of the intestinal tube 6 cm from the nearest end resection margin was narrow with a diameter of approximately 1.5 cm. The serosal surface was similar to a polypoid with a size of approximately 2 cm × 1 cm × 1 cm.

OUTCOME AND FOLLOW-UP

The patient had a good postoperative recovery with no complications, and she was discharged smoothly from the hospital one week after her surgery. As of August 1, 2021, she has been regularly followed up for 2 years at an outpatient clinic, and there have been no signs of recurrence or metastasis.

DISCUSSION

Primary plasmacytoma of the small intestine is rare in clinical practice. Here, we firstly report a case of intestinal perforation with abdominal abscess caused by EMP of the small intestine in a 55-year-old female. The diagnosis is based on a pathologically confirmed small intestinal mass with clonal growth of plasma cells, normal bone marrow histological examination, and normal serum monoclonal immunoglobulin levels[14]. EMP can be divided into two types: Primary and secondary. EMP can also present as a secondary tumor of another plasma cell neoplasm, such as MM[15]. MM must be excluded before the diagnosis of primary EMP[16]. The case we reported had no positive laboratory or imaging findings of MM, which met the diagnostic criteria of primary EMP. In this paper, we performed a review of the well-documented primary gastrointestinal EMP cases in the last 20 years and presented these results in table form[4-7,11,17-45] (Table 1). These results show that gastrointestinal EMP is common in patients over the age of 50 years, and the incidence rate is higher in men compared with women (2:1). The clinical manifestations of gastrointestinal EMPs vary with the location of the tumor and lack specificity. In the early stage, this disease is often asymptomatic, and patients often seek medical treatment because of pain or discomfort caused by local tumor compression. Other clinical manifestations include gastrointestinal bleeding or obstruction, changes in bowel habits, *etc.* In our case, the patient presented with sudden abdominal pain and abdominal distension, which may have been caused by intestinal

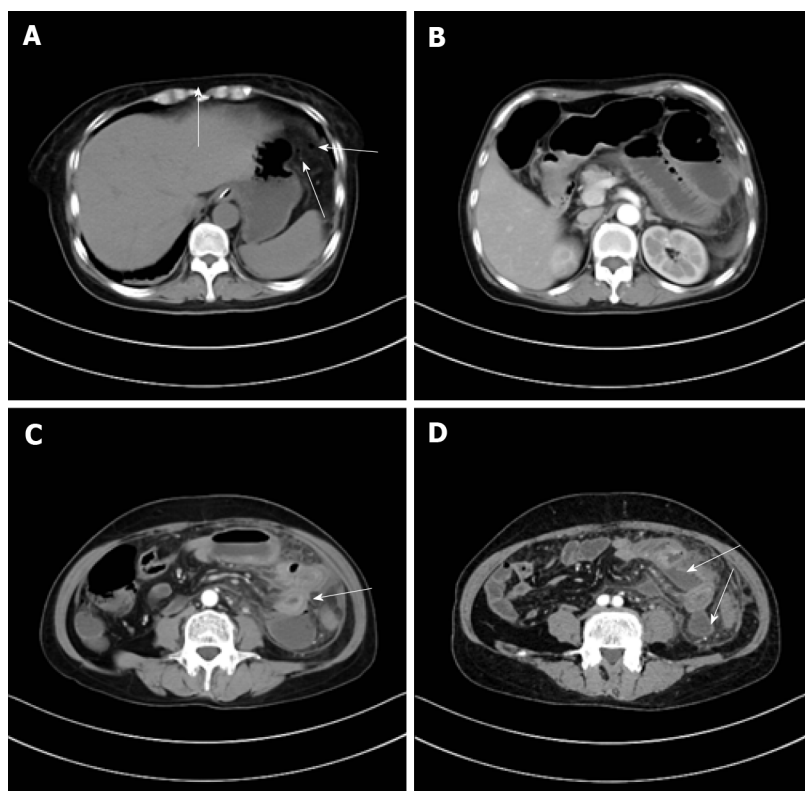
Table 1 Well documented case reports of primary gastrointestinal extramedullary plasmacytoma

Ref.	Age	Gender	Location	Presentation	Operative	Non-operative	Outcome
Katodritou <i>et al</i> [17], 2008	68	Male	Stomach	Upper-gastrointestinal bleeding	None	Bortezomib, dexamethasone	No recurrence 13 mo after diagnosis
Park <i>et al</i> [18], 2009	50	Female	Stomach	None	Endoscopic submucosal dissection	None	No recurrence during 12 mo follow-up
Krishnamoorthy <i>et al</i> [19], 2010	57	Male	Stomach	Upper-gastrointestinal bleeding	Gastrectomy	None	N/A
Park <i>et al</i> [20], 2014	70	Male	Stomach	Indigestion	Endoscopic submucosal resection	Oral thalidomide therapy	No recurrence during 24 mo follow-up
Zhao <i>et al</i> [21], 2014	79	Male	Stomach	Epigastric pain	Surgical resection	None	No recurrence during 8 mo follow-up
Fukuhara <i>et al</i> [22], 2016	36	Male	Stomach	Dyspnoea, fatigue	Total gastrectomy, lymphadenectomy	Chemotherapy and autologous peripheral blood stem-cell transplantation	No recurrence during 18 mo follow-up
Kang <i>et al</i> [23], 2016	78	Female	Stomach	Epigastric pain	Refused	High-dose dexamethasone	Completely regressed and remission was maintained for over 1 yr
Takahashi <i>et al</i> [24], 2016	64	Female	Stomach	Loss of appetite and reduced body weight	Surgical resection	None	No recurrence during 36 mo follow-up
Oliveira <i>et al</i> [25], 2017	61	Male	Stomach	Upper gastrointestinal bleeding	Endoscopic polypectomy	None	No recurrence during 6 yr follow-up
Ding <i>et al</i> [6], 2019	65	Male	Stomach	Epigastric discomfort and mass	Distal gastrectomy	None	No recurrence during 3 mo follow-up
Weidenbaum <i>et al</i> [26], 2022	83	Female	Stomach	None	None	Radiation therapy, chemotherapy	N/A
Carneiro <i>et al</i> [27], 2009	72	Male	Duodenum	Epigastric pain, vomiting and weight loss	Resection of the fourth part of the duodenum and proximal segment of jejunum	None	No recurrence after 12 mo follow-up
Ammar <i>et al</i> [28], 2010	69	Female	Duodenum	Fatigue, melaena	Percutaneous transhepatic biliary drainage	Extra-corporeal radiotherapy	N/A
Yoshida <i>et al</i> [29], 2004	70	Female	Ileum	High fever, bowel obstruction	Combined resection of the terminal ileum and ascending colon	Chemotherapy	Died of cachexia 4 mo after surgery
Moriyama <i>et al</i> [30], 2006	73	Female	Ileum	Abdominal pain	Local resection of the tumor	None	No recurrence after 28 mo follow-up
Gabriel <i>et al</i> [31], 2014	62	Male	Ileocecum	Melena	Right hemicolectomy	None	N/A
Zhang <i>et al</i> [32], 2017	63	Female	Ileocecum	Episodic pain around the umbilicus	Right hemicolectomy surgery	None	N/A
Hanawa <i>et al</i> [7], 2019	63	Male	Ileocecum	Abdominal distention and weight loss	Surgically removed stenotic lesion of small intestine	Anti-Crohn's disease	No recurrence during 36 mo follow-up
Evans <i>et al</i> [5], 2020	35	Male	Appendix	Upper abdominal pain	Appendectomy	None	Alive without evidence of disease
Doki <i>et al</i> [33], 2008	64	Male	Ascending colon	Aggravated pain in the right lower abdomen	Surgical resection	Chemotherapy (recurrence)	Recurrence 4 mo after surgery. Dead after 12 mo
Zhu <i>et al</i> [11], 2017	67	Female	Ascending colon	Abdominal pain, and reduced gas and stool passage	Refused	Chemotherapy	Died of agranulocytosis and sepsis
Han <i>et al</i> [34], 2014	49	Male	Transverse	Periumbilical	Extended laparoscopic left	None	No recurrence during

			colon	abdominal pain	hemicolectomy		36 mo follow-up
Lee <i>et al</i> [35], 2013	45	Male	Descending colon	Lower abdominal pain, diarrhoea, weight loss	Laparoscopic extended left hemicolectomy with lymph node dissection	None	No recurrence during 36 mo follow-up
Zihni <i>et al</i> [36], 2014	54	Male	Descending colon	Abdominal pain	Left hemicolectomy, small bowel resection	None	Died on the thirty-fifth post-operative day due to sepsis
Lattuneddu <i>et al</i> [37], 2004	86	Male	Sigmoid colon	Abdominal pain, rectal bleeding and asthenia	Segmental resection of the left colon, with a complementary colectomy	None	No recurrence during 6 mo follow-up
Jones <i>et al</i> [38], 2008	65	Male	Sigmoid colon	Dysuria, constant left lower quadrant abdominal pain	Sigmoid colon resection	None	N/A
	57	Male	Sigmoid colon	Fatigue, hematochezia	Hartmann resection of the sigmoid colon	None	Died on day 19 after surgery
Mjoli <i>et al</i> [39], 2016	42	Male	Sigmoid colon	Rectal bleeding	Sigmoid colectomy	None	No recurrence during 3 mo follow-up
Kitamura <i>et al</i> [40], 2018	77	Female	Sigmoid colon	Lower abdominal pain, nausea	Resection of the sigmoid colon, artificial anus	None	No recurrence during 14 mo follow-up
Gupta <i>et al</i> [41], 2007	42	Male	Colon (multiple sites)	Diarrhea, progressive weight loss and malaise	Subtotal colectomy	Adjuvant chemotherapy (melphalan, prednisolone)	No recurrence during 17 mo follow-up
Nakagawa <i>et al</i> [42], 2011	84	Female	Cecum, rectum	None	Endoscopic mucosal resection	None	N/A
Gohil <i>et al</i> [43], 2015	55	Male	Rectum	Perianal pain, altered bowel habits	Surgical resection	Adjuvant radiotherapy	No recurrence during 17 mo follow-up
Bhangoo <i>et al</i> [44], 2021	82	Male	Rectosigmoid colon	Rectal bleeding and obstruction	Open sigmoid low anterior resection	Radiotherapy	N/A
Lin <i>et al</i> [4], 2021	80	Male	Rectum	Change of his bowel habit and inhibited defecation	Radical resection of the mass by laparoscope	None	N/A
Antunes <i>et al</i> [45], 2010	61	Male	Anal canal	Abdominal discomfort, tenesmus, perineal pain	None	Radiotherapy	No recurrence during 24 mo follow-up

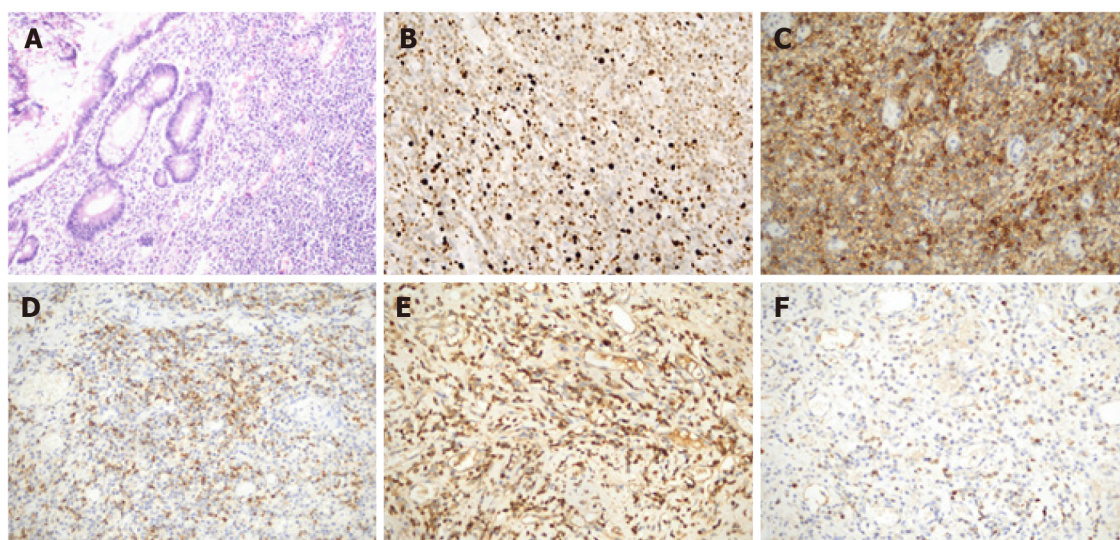
perforation. CT images usually show an infiltrating mass with clear boundaries. When the mass is large, a liquefied necrotic area may appear in the center. However, until now, there has been no description of the specific imaging characteristics of EMP[46]. Therefore, the role of imaging examinations in differentiating gastrointestinal EMP from other neoplastic diseases is limited. EMP may be occasionally misdiagnosed as cancer[47], stromal tumors or inflammatory bowel disease[41]. Hence, the accurate diagnosis of gastrointestinal EMP still depends on histopathological results. For gastrointestinal EMP, endoscopic biopsy is a convenient and practical diagnostic method.

Given the rarity of gastrointestinal EMP, unified treatment guidelines for this disease are not available. At present, complete surgical resection is a good choice for the treatment of gastrointestinal EMP. Several studies have reported that patients with gastrointestinal EMP can be completely cured after surgical resection of tumors[21,24,34,40]. Most of the patients underwent routine surgery. However, the EMP patient we reported with perforation of the small intestine required emergency surgery. In addition to perforation of small intestinal EMPs, perforation of colon EMPs can also occur. Kitamura *et al*[40] reported one case of EMP in the sigmoid colon with perforation. The patient underwent emergency surgery without postoperative adjuvant chemotherapy with no recurrence after 14 mo of regular follow-up. In recent years, endoscopic treatments, such as endoscopic mucosal resection or endoscopic submucosal dissection, have become increasingly popular in gastrointestinal EMP surgery and have obtained a good therapeutic effect[18,20,25]. Due to the high sensitivity of primary EMP to radiotherapy, local radiotherapy is also an effective treatment method[45,48]. At present, many hospitals use radiotherapy as an adjuvant treatment for patients with gastrointestinal EMP after surgery to prevent local recurrence or metastasis. Moreover, radiotherapy can also represent an additional therapeutic option for cases with incomplete resection, lymph node involvement or recurrence. There are also some results suggesting that EMP is well controlled with a dose of 40 Gy or more[49]. In cases that are small, well-defined, or postexcision with positive margins, 40 Gy is acceptable[50]. Currently, most studies in this area are retrospective, and more prospective randomized controlled studies are needed to verify these results.



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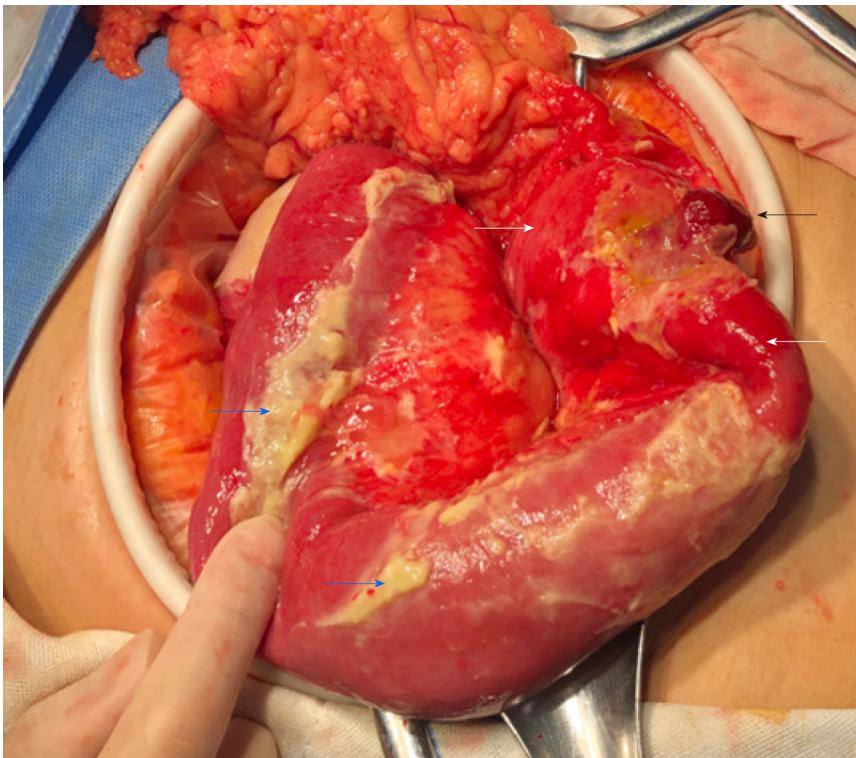
Figure 1 Preoperative computed tomography scan findings. A: There are small air bubbles scattered under the left diaphragm (indicated by white arrow); B: The small intestinal lumen in the upper left abdomen is dilated with gas and fluid accumulation, showing multiple fluid-gas level changes; C: The intestinal wall presents edematous thickening (indicated by white arrow), and the density of local mesentery increases; D: Multiple abscesses can be seen between the intestinal lumen (indicated by white arrow).



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Figure 2 Histopathological examination of extramedullary plasmacytoma of small intestine. Microscopic view of the resected extramedullary plasmacytoma originating from small intestine. A: Hematoxylin and eosin staining, magnification × 100; B: Ki67, magnification × 200; C: CD38, magnification × 200; D: CD138, magnification × 200; E: Kappa, magnification × 200; F: Lambda, magnification × 200.

EMP is a low malignancy tumor with a good prognosis. Local recurrence or recurrence at other sites occurred in 7.5% and 10% of patients, respectively, and the 15-year survival rate was 78%[51]. Given that EMP may recur or progress to MM in some patients, regular long-term follow-up is recommended and necessary. Detailed medical records, physical examination, laboratory tests, including complete blood cell count, beta-2 microglobulin and immunoglobulin levels, renal function, and imaging



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Figure 3 Intra-operative findings. The small intestinal serosa has a dark red polyp-like protrusion (black arrow) with a perforation about 0.5 cm in diameter at the top. The local intestinal wall presents hyperemia, edema and thickening (white arrow). The surface of the surrounding small intestine is covered with a large amount of purulent material (blue arrow).

examination of the abdomen are required for patients during follow-up[52].

CONCLUSION

In conclusion, EMP of the small intestine is extremely rare and lacks specific clinical and imaging manifestations. EMP may be associated with spontaneous perforation, which requires emergency surgery. We firstly report a case of intestinal perforation caused by EMP of the small intestine. The diagnosis of EMP still depends on the histopathological results. Surgical resection and radiotherapy can obtain good therapeutic effects. The cooperation of a multidisciplinary team, including pathologists, hematologists, radiologists and surgeons, is needed to develop the best diagnostic and therapeutic plan for gastrointestinal EMP.

FOOTNOTES

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REFERENCES

- 1 **Knowing MA**, Harwood AR, Bergsagel DE. Comparison of extramedullary plasmacytomas with solitary and multiple plasma cell tumors of bone. *J Clin Oncol* 1983; **1**: 255-262 [PMID: 6668499 DOI: 10.1200/JCO.1983.1.4.255]
- 2 **Liebross RH**, Ha CS, Cox JD, Weber D, Delasalle K, Alexanian R. Clinical course of solitary extramedullary plasmacytoma. *Radiother Oncol* 1999; **52**: 245-249 [PMID: 10580871 DOI: 10.1016/s0167-8140(99)00114-0]
- 3 **Dores GM**, Landgren O, McGlynn KA, Curtis RE, Linet MS, Devesa SS. Plasmacytoma of bone, extramedullary plasmacytoma, and multiple myeloma: incidence and survival in the United States, 1992-2004. *Br J Haematol* 2009; **144**: 86-94 [PMID: 19016727 DOI: 10.1111/j.1365-2141.2008.07421.x]
- 4 **Lin QT**, Cai XR. Extramedullary plasmacytoma involving rectum: A case report and literature review. *Radiol Case Rep* 2021; **16**: 785-788 [PMID: 33537109 DOI: 10.1016/j.radcr.2021.01.023]
- 5 **Evans MG**, Zhao X, Lin F, Wang BY. First Reported Case of Extramedullary Plasmacytoma of the Appendix. *Gastroenterology Res* 2020; **13**: 85-87 [PMID: 32362968 DOI: 10.14740/gr1277]
- 6 **Ding W**, Tan Y, Qian Y, Xue W, Wang Y, Xi C, Gu K, Xu Y, Xu X. Primary plasmablastic plasmacytoma in the stomach of an immunocompetent adult: A case report. *Medicine (Baltimore)* 2019; **98**: e14235 [PMID: 30681607 DOI: 10.1097/MD.00000000000014235]
- 7 **Hanawa Y**, Higashiyama M, Horiuchi K, Ayaki K, Ito S, Mizoguchi A, Nishii S, Wada A, Inaba K, Sugihara N, Furuhashi H, Takajo T, Shirakabe K, Watanabe C, Tomita K, Komoto S, Nagao S, Miura S, Shimazaki H, Takeuchi K, Ueno H, Hokari R. Crohn's Disease Accompanied with Small Intestinal Extramedullary Plasmacytoma. *Intern Med* 2019; **58**: 2019-2023 [PMID: 30918171 DOI: 10.2169/internalmedicine.1687-18]
- 8 **Glasbey JC**, Arshad F, Almond LM, Vydiyanath B, Desai A, Gourevitch D, Ford SJ. Gastrointestinal manifestations of extramedullary plasmacytoma: a narrative review and illustrative case reports. *Ann R Coll Surg Engl* 2018; **100**: 371-376 [PMID: 29692194 DOI: 10.1308/rcsann.2018.0015]
- 9 **Comba IY**, Torres Luna NE, Cooper C, W Crespo M, Carilli A. A Rare Case of Extramedullary Plasmacytoma Presenting as Massive Upper Gastrointestinal Bleeding. *Cureus* 2019; **11**: e3993 [PMID: 30972272 DOI: 10.7759/cureus.3993]
- 10 **Iosif E**, Rees C, Beeslaar S, Shamali A, Lauro R, Kyriakides C. Gastrointestinal bleeding as initial presentation of extramedullary plasma cell neoplasms: A case report and review of the literature. *World J Gastrointest Endosc* 2019; **11**: 308-321 [PMID: 31040892 DOI: 10.4253/wjge.v11.i4.308]
- 11 **Zhu Z**, Cao H, Chen L. Incomplete Colonic Obstruction Caused by Extramedullary Plasmacytoma. *Clin Gastroenterol Hepatol* 2017; **15**: e69-e70 [PMID: 27613261 DOI: 10.1016/j.cgh.2016.08.043]
- 12 **Alnimer L**, Zakaria A, Alshare B, Samhouri Y, Raphael M. A Rare Case of Small Bowel Extramedullary Plasmacytomas Presenting With Intestinal Obstruction. *Cureus* 2021; **13**: e15704 [PMID: 34277289 DOI: 10.7759/cureus.15704]
- 13 **Ignjatović M**, Bezmarević M, Cerović S. Solitary extramedullary plasmacytoma of the duodenum and pancreas: A case report and review of the literature. *Vojnosanit Pregl* 2016; **73**: 402-407 [PMID: 29309111 DOI: 10.2298/VSP1410311421]
- 14 **Soutar R**, Lucraft H, Jackson G, Reece A, Bird J, Low E, Samson D; Working Group of the UK Myeloma Forum; British Committee for Standards in Haematology; British Society for Haematology. Guidelines on the diagnosis and management of solitary plasmacytoma of bone and solitary extramedullary plasmacytoma. *Clin Oncol (R Coll Radiol)* 2004; **16**: 405-413 [PMID: 15487132 DOI: 10.1016/j.clon.2004.02.007]
- 15 **Fagkrezos D**, Manes K, Paraskeva K, Lenos M, Triantopoulou C, Apeessou D, Maniatis P. Secondary extramedullary plasmacytoma of sigmoid colon in a patient with multiple myeloma: a case report. *J Med Case Rep* 2018; **12**: 379 [PMID: 30583721 DOI: 10.1186/s13256-018-1888-4]
- 16 **Wallace E**, Stewart Z, Theriot D, Shaffer W, Guillory S, Hanemann M, Danrad R, Spieler B. Atypical Presentation of Extramedullary Plasmacytoma. *Ochsner J* 2018; **18**: 101-103 [PMID: 29559881]
- 17 **Katodritou E**, Kartsios C, Gastari V, Verrou E, Mihou D, Banti A, Lazaraki G, Lazaridou A, Kaloutsis V, Zervas K. Successful treatment of extramedullary gastric plasmacytoma with the combination of bortezomib and dexamethasone: first reported case. *Leuk Res* 2008; **32**: 339-341 [PMID: 17560647 DOI: 10.1016/j.leukres.2007.04.016]
- 18 **Park CH**, Lee SM, Kim TO, Kim DU, Jung WJ, Kim GH, Song GA. Treatment of solitary extramedullary plasmacytoma of the stomach with endoscopic submucosal dissection. *Gut Liver* 2009; **3**: 334-337 [PMID: 20431772 DOI: 10.5009/gnl.2009.3.4.334]
- 19 **Krishnamoorthy N**, Bal MM, Ramadwar M, Deodhar K, Mohandas KM. A rare case of primary gastric plasmacytoma: an unforeseen surprise. *J Cancer Res Ther* 2010; **6**: 549-551 [PMID: 21358099 DOI: 10.4103/0973-1482.77067]
- 20 **Park SY**, Moon HS, Seong JK, Jeong HY, Yoon BY, Hwang SW, Song KS. Successful treatment of a gastric plasmacytoma using a combination of endoscopic submucosal dissection and oral thalidomide. *Clin Endosc* 2014; **47**: 564-567 [PMID: 25505724 DOI: 10.5946/ce.2014.47.6.564]
- 21 **Zhao ZH**, Yang JF, Wang JD, Wei JG, Liu F, Wang BY. Imaging findings of primary gastric plasmacytoma: a case report.

- World J Gastroenterol* 2014; **20**: 10202-10207 [PMID: [25110449](#) DOI: [10.3748/wjg.v20.i29.10202](#)]
- 22 **Fukuhara S**, Tazawa H, Okanobu H, Kida M, Kido M, Takafuta T, Nishida T, Ohdan H, Sakimoto H. Successful treatment of primary advanced gastric plasmacytoma using a combination of surgical resection and chemotherapy with bortezomib: A case report. *Int J Surg Case Rep* 2016; **27**: 133-136 [PMID: [27611798](#) DOI: [10.1016/j.ijscr.2016.08.041](#)]
 - 23 **Kang DY**, Kim GB, Choi BS, Seo JW, Lim HJ, Hong R, Park SG. Successful treatment of a primary gastric plasmacytoma mimicking intractable gastric ulcer by using high-dose dexamethasone therapy: a case report. *J Med Case Rep* 2016; **10**: 79 [PMID: [27036197](#) DOI: [10.1186/s13256-016-0863-1](#)]
 - 24 **Takahashi T**, Morita T, Matsuno Y. Primary Extramedullary Plasmacytoma in the Gastroduodenal Canal Associated With Epstein-Barr Virus-Associated Adenocarcinoma of the Stomach: A Case Report. *Int J Surg Pathol* 2016; **24**: 757-762 [PMID: [27466321](#) DOI: [10.1177/1066896916659359](#)]
 - 25 **Oliveira RC**, Amaro P, Julião MJ, Cipriano MA. Primary gastric plasmacytoma: a rare entity. *BMJ Case Rep* 2017; **2017** [PMID: [28167693](#) DOI: [10.1136/bcr-2016-218967](#)]
 - 26 **Weidenbaum C**. Case report: gastric plasmacytoma resistant to radiation therapy. *Postgrad Med* 2022; **134**: 122-123 [PMID: [34813388](#) DOI: [10.1080/00325481.2021.2008726](#)]
 - 27 **Carneiro FP**, Sobreira MN, Maia LB, Sartorelli AC, Franceschi LE, Brandão MB, Calaça BW, Lustosa FS, Lopes JV. Extramedullary plasmocytoma associated with a massive deposit of amyloid in the duodenum. *World J Gastroenterol* 2009; **15**: 3565-3568 [PMID: [19630116](#) DOI: [10.3748/wjg.15.3565](#)]
 - 28 **Ammar T**, Kreisel F, Ciorba MA. Primary antral duodenal extramedullary plasmacytoma presenting with melena. *Clin Gastroenterol Hepatol* 2010; **8**: A32 [PMID: [19286477](#) DOI: [10.1016/j.cgh.2009.03.005](#)]
 - 29 **Yoshida T**, Soda K, Yamada S, Nakahara M, Nishida J, Kametaka M, Konishi F. Biclinal extramedullary plasmacytoma arising in the peritoneal cavity: report of a case. *Surg Today* 2004; **34**: 379-382 [PMID: [15052459](#) DOI: [10.1007/s00595-003-2705-1](#)]
 - 30 **Moriyama H**, Kawahara K, Noguchi T, Kikuchi R, Wada S, Takeno S, Kashima K. Primary extramedullary plasmacytoma of the small intestine. A case report and review of the literature. *J Exp Clin Cancer Res* 2006; **25**: 129-134 [PMID: [16761629](#)]
 - 31 **Gabriel EM**, Savu M. Discovery of a rare ileocecal plasmacytoma. *J Surg Case Rep* 2014; **2014** [PMID: [24876398](#) DOI: [10.1093/jscr/rju016](#)]
 - 32 **Zhang D**, Cao D, Shen D, Mulmi Shrestha S, Yin Y. Extramedullary plasmacytoma occurring in ileocecum: A case report and literature review. *Medicine (Baltimore)* 2017; **96**: e9313 [PMID: [29390503](#) DOI: [10.1097/MD.00000000000009313](#)]
 - 33 **Doki T**, Takeuchi O, Kaiho T, Tsuchiya S, Matsuzaki O, Miyazaki M. Primary isolated extramedullary plasmacytoma of the colon. *Int J Colorectal Dis* 2008; **23**: 719-720 [PMID: [18239923](#) DOI: [10.1007/s00384-008-0439-7](#)]
 - 34 **Han YJ**, Park SJ, Park MI, Moon W, Kim SE, Ku KH, Ock SY. Solitary extramedullary plasmacytoma in the gastrointestinal tract: report of two cases and review of literature. *Korean J Gastroenterol* 2014; **63**: 316-320 [PMID: [24870305](#) DOI: [10.4166/kjg.2014.63.5.316](#)]
 - 35 **Lee SH**, Ahn BK, Baek SU, Chang HK. Primary Isolated Extramedullary Plasmacytoma in the Colon. *Gastroenterology Res* 2013; **6**: 152-155 [PMID: [27785246](#) DOI: [10.4021/gr552w](#)]
 - 36 **Zihni İ**, Dinç R, Canpolat S, Cengiz F, Uslu A. Extramedullary plasmacytoma of the colon: a case report. *Ulus Cerrahi Derg* 2014; **30**: 231-233 [PMID: [25931923](#) DOI: [10.5152/UCD.2013.45](#)]
 - 37 **Lattuneddu A**, Farneti F, Lucci E, Garcea D, Ronconi S, Saragoni L. A case of primary extramedullary plasmacytoma of the colon. *Int J Colorectal Dis* 2004; **19**: 289-291 [PMID: [14689207](#) DOI: [10.1007/s00384-003-0560-6](#)]
 - 38 **Jones JE**, Brand MI, Saclarides TJ, Jakate S. Primary extramedullary plasmacytomas of the colon. *Am Surg* 2008; **74**: 873-874 [PMID: [18807681](#)]
 - 39 **Mjoli M**, Vorajee N, Naidoo Y, Madiba T. Solitary extramedullary plasmacytoma of the colon, rectum and anus. *S Afr J Surg* 2016; **54**: 45-47 [PMID: [28240504](#)]
 - 40 **Kitamura F**, Doi K, Ishiodori H, Ohchi T, Baba H. Primary extramedullary plasmacytoma of the sigmoid colon with perforation: a case report. *Surg Case Rep* 2018; **4**: 28 [PMID: [29619633](#) DOI: [10.1186/s40792-018-0437-0](#)]
 - 41 **Gupta V**, Nahak B, Sakhuja P, Agarwal AK, Kumar N, Mishra PK. Primary isolated extramedullary plasmacytoma of colon. *World J Surg Oncol* 2007; **5**: 47 [PMID: [17470287](#) DOI: [10.1186/1477-7819-5-47](#)]
 - 42 **Nakagawa Y**, Nagai T, Okawara H, Nakashima H, Hisamatsu A, Syutou M, Yamauchi M, Kai S, Nakayama T, Yokoyama S, Murakami K, Fujioka T. Minute primary extramedullary plasmacytomas of the large intestine. *Endoscopy* 2011; **43** Suppl 2 UCTN: E105-E106 [PMID: [21424997](#) DOI: [10.1055/s-0030-1256138](#)]
 - 43 **Gohil MH**, Bhavsar DC, Suryanarayana U, Jetly DH. Plasmacytoma rectum extending to para-rectal region. *J Cancer Res Ther* 2015; **11**: 662 [PMID: [26458684](#) DOI: [10.4103/0973-1482.140799](#)]
 - 44 **Bhangoo RS**, McCullough AE, Yang M. Obstructive rectosigmoid colon solitary extramedullary plasmacytoma. *Dig Liver Dis* 2021; **53**: 496-497 [PMID: [33376074](#) DOI: [10.1016/j.dld.2020.12.008](#)]
 - 45 **Antunes MI**, Bujor L, Grillo IM. Anal canal plasmacytoma-An uncommon presentation site. *Rep Pract Oncol Radiother* 2010; **16**: 36-39 [PMID: [24376953](#) DOI: [10.1016/j.rpor.2010.12.002](#)]
 - 46 **Ryu SW**, Cohen-Hallaleh V. Imaging features of extramedullary plasmacytoma. *J Med Imaging Radiat Oncol* 2020; **64**: 44-51 [PMID: [31785037](#) DOI: [10.1111/1754-9485.12975](#)]
 - 47 **Parnell K**, Ahmed M, Smalligan RD, Nadesan S. Extramedullary plasmacytoma mimicking colon carcinoma: an unusual presentation and review of the literature. *BMJ Case Rep* 2015; **2015** [PMID: [26498668](#) DOI: [10.1136/bcr-2015-210973](#)]
 - 48 **Barzenje DA**, Kolstad A, Ghanima W, Holte H. Long-term outcome of patients with solitary plasmacytoma treated with radiotherapy: A population-based, single-center study with median follow-up of 13.7 years. *Hematol Oncol* 2018; **36**: 217-223 [PMID: [28393375](#) DOI: [10.1002/hon.2415](#)]
 - 49 **Alghisi A**, Borghetti P, Maddalo M, Roccaro AM, Tucci A, Mazzola R, Magrini SM, Lo Casto A, Bonù ML, Tomasini D, Pasinetti N, Peretto G, Bertagna F, Tomasi C, Buglione M, Triggiani L. Radiotherapy for the treatment of solitary plasmacytoma: 7-year outcomes by a mono-institutional experience. *J Cancer Res Clin Oncol* 2021; **147**: 1773-1779 [PMID: [33201300](#) DOI: [10.1007/s00432-020-03452-y](#)]

- 50 **Tsang RW**, Campbell BA, Goda JS, Kelsey CR, Kirova YM, Parikh RR, Ng AK, Ricardi U, Suh CO, Mauch PM, Specht L, Yahalom J. Radiation Therapy for Solitary Plasmacytoma and Multiple Myeloma: Guidelines From the International Lymphoma Radiation Oncology Group. *Int J Radiat Oncol Biol Phys* 2018; **101**: 794-808 [PMID: [29976492](#) DOI: [10.1016/j.ijrobp.2018.05.009](#)]
- 51 **Galieni P**, Cavo M, Pulsoni A, Avvisati G, Bigazzi C, Neri S, Caliceti U, Benni M, Ronconi S, Lauria F. Clinical outcome of extramedullary plasmacytoma. *Haematologica* 2000; **85**: 47-51 [PMID: [10629591](#)]
- 52 **Lopes da Silva R**. Extramedullary plasmacytoma of the small intestine: clinical features, diagnosis and treatment. *J Dig Dis* 2012; **13**: 10-18 [PMID: [22188911](#) DOI: [10.1111/j.1751-2980.2011.00544.x](#)]



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