CASE REPORT

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Solitary extramedullary plasmacytoma of the duodenum and pancreas – A case report and review of the literature

Solitarni ekstramedularni plazmocitom duodenuma i pankreasa

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Abstract

Introduction. The extramedullary plasmacytomas (EMPs) are rare tumors of plasma cell disorders which are rarely found in the duodenum. We presented a case of solitary EMPs involving the duodenum and pancreas successfully treated by surgical resection after failure of chemotherapy. **Case report.** A 55-year-old female with previously diagnosed solitary EMP of the duodenum was admitted to our institution after failure of three cycles of vincristine, adriablastine, dexamethasone (VAD) chemotherapy regimen with an upper gastrointestinal obstruction. On admission computed tomography of the abdomen showed tumor in the region of the second part of duodenum and uncinate process of the pancreas with a complete duodenal obstruction. Intraoperatively a tumor formation was in the region of the second duodenal part, originated from the wall of duodenum with the total diameter of 7 × 5 cm, covering the entire circumference of duodenal wall leaded to a narrowing of duodenal lumen to the thigh gap with an upper gastrointestinal obstruction. Infiltration in the head of the pancreas and uncinate process were also found. The Whipple's procedure was performed but postoperative course was complicated by rapidly refilling chylous ascites which was resolved 4 days after the surgery. **Conclusion.** Each patient with gastrointestinal EMPs should be considered separately and in timely manner, thus adequate treatment could provide local disease control.

Key words:
plasmacytoma; duodenum; pancreas; intestinal obstruction; surgical procedures, operative; postoperative period; ascites; treatment outcome.

Apstrakt

Uvod. Ekstramedularni plazmocitomi (EMP) su retki tumori koji pripadaju plazmaćelijskim oboljenjima sa retkom lokalizacijom u duodenumu. Prikazali smo bolesnicu sa solitarnim EMPs i zahvatanjem duodenuma i pankreasa uspešno izlečenu hirurškom resekcijom, nakon neuspeha hemioterapije. **Prikaz bolesnika.** Bolesnica, starosti 55 godina, sa prethodno dijagnostikovanim solitarnim EMP duodenuma i pankreasa primljena je u našu ustanovu nakon neuspeha u lečenju sa tri ciklusa hemioterapije po vinkristin, adriablastin, deksametazon (VAD) protokolu, sa visokom gastrointestinalnom opstrukcijom. Na prijemu, kompjuterizovanom tomografijom abdomena otkriven je tumor u predelu drugog dela duodenuma i uncinatnog nastavka pankreasa, sa potpunom opstrukcijom duodenuma. Intraoperativno, nađen je tumor u predelu drugog dela duodenuma, koji je poticao iz zida duodenuma, sa prečnikom od 7 × 5 cm, koji je zahvatao kompletnu cirkumferenciju zida duodenuma dovodeći do sužavanja lumena duodenuma na usku pukotinu sa visokom gastrointestinalnom opstrukcijom. Takođe, nađena je i infiltracija glave pankreasa i uncinatnog nastavka. Primenjena je Viplova procedura, ali se postoperativni tok komplikovao nastankom obilnog hiloznog ascita, što je sanirano četiri dana nakon operacije. **Zaključak.** Svakog bolesnika sa gastrointestinalnom lokalizacijom EMP trebalo bi posmatrati zasebno, a blagovremeno i adekvatno lečenje može omogućiti lokalnu kontrolu bolesti.

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Ključne reči:
plazmocitom; duodenum; pankreas; creva, opstrukcija; hirurgija, operativne procedure; postoperativni period; ascit; lečenje, ishod.

Introduction

Plasmacytoma derives from clonal proliferation of plasma cells and can be classified as an osseous disease or extraosseous tumor. It appears in three clinical forms: multiple myeloma (MM), medullary plasmacytoma (MP) and extramedullary plasmacytoma (EMP) [1].

Solitary EMPs are rare tumors constituting fewer than 5% of all plasma cell tumors. These tumors could originate in a variety of anatomical sites, but most often, approximately

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90% of cases, have been reported from the upper respiratory tract. Less than 10% of EMPs occur in the gastrointestinal tract, whereas the stomach is the most frequent site of its occurrence [2, 3]. There are only several cases described in the literature of EMP in the duodenum and few cases involving the pancreas or both duodenum and pancreas [4–18].

We presented a case with solitary EMPs in the duodenum and pancreatic head infiltration with an upper gastrointestinal obstruction, surgically treated after failure of chemotherapy.

Case report

A 55-year-old Caucasian female was admitted to our institution due to deterioration of the general condition, persistent vomiting and weight loss of 5 kg a month before the hospitalization. On admission all laboratory findings including bilirubin were in normal ranges with the exclusion of the erythrocyte sedimentation rate of 58 mm/h (normal range: 0–20 mm/h), alkaline phosphatase of 281 U/L (normal range: 20–140 U/L) and lactate dehydrogenase of 344 U/L (normal range: 140–280 U/L).

Almost a year before, the patient was admitted to our hospital also with severe abdominal pain, whereas abdominal ultrasound showed tumor formation in the upper right region with the diameter of 10 × 5 cm. Computed tomography (CT) scan showed enlargement of the head of pancreas and stenosis of duodenum in the region distally of the duodenal papilla of the length of 7 cm. In the same hospitalization esophagogastroduodenoscopy showed normal duodenal mucosa but narrowed duodenal lumen of 6 cm in length in the region of the second and the third part of the duodenum. Biopsies from that region showed chronic lymphoproliferative plasma cell infiltration which corresponded to solitary EMPs of duodenum, immunoglobulin A (IgA) lambda chain. The application of diagnostic criteria, including bone marrow biopsy, did not show the existence of MM. Considering the tumor size and localization, the patient's age, and propensity for gastrointestinal occlusion, it was decided that the patient begin receiving VAD (vincristine, adriablastine, dexamethasone) chemotherapy regimen protocol.

After the third cycle of VAD chemotherapy regimen, multislice CT abdominal scan did not show any improvement in the reduction of tumor mass (Figure 1). Due to impairment of the patient general condition (vomiting and weight loss) and evident failure of chemotherapy, it was decided to perform surgical intervention.

With the open surgical approach and medial laparotomy we found intraoperatively a tumor formation in the region of the second duodenal portion, the first and the second duodenal knee, originated from the wall of the duodenum with the total diameter of 7 × 5 cm. The tumor covered the entire circumference of the duodenal wall leading to duodenal lumen narrowing to a tight gap with upper gastrointestinal obstruction and moderate *gastrectasia*. The tumor consistency was solid with the infiltration of head of the pancreas and uncinate process in the anterior segments, but without involvement of the portal vein and superior mesenteric vessels (Figures 2 and 3).

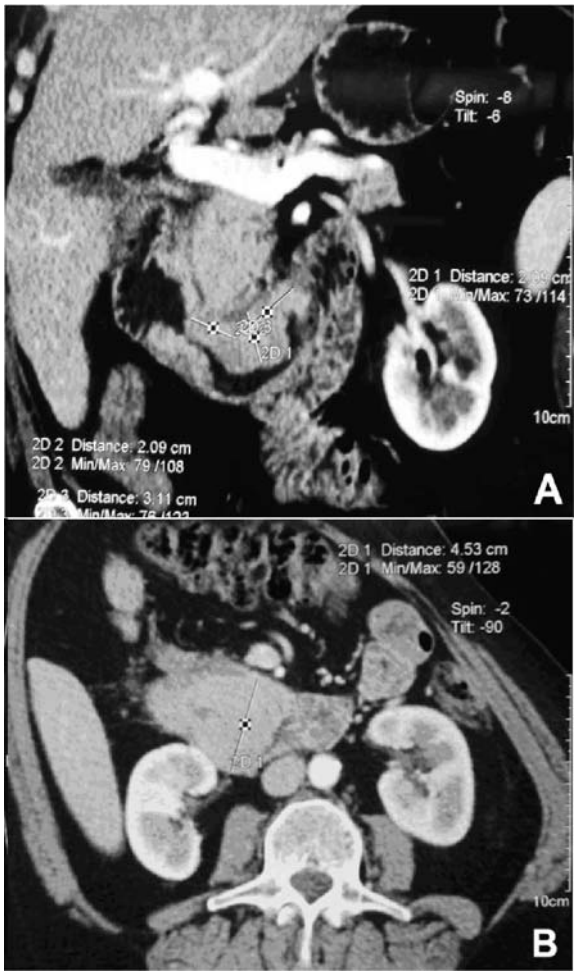

Fig. 1 – A) Multislice computed tomography abdominal scan showing tumor in the wall of the second part of the duodenum (frontal section); B) tumor in the region of the second duodenal knee and uncinate process with complete duodenal obstruction (transversal section).

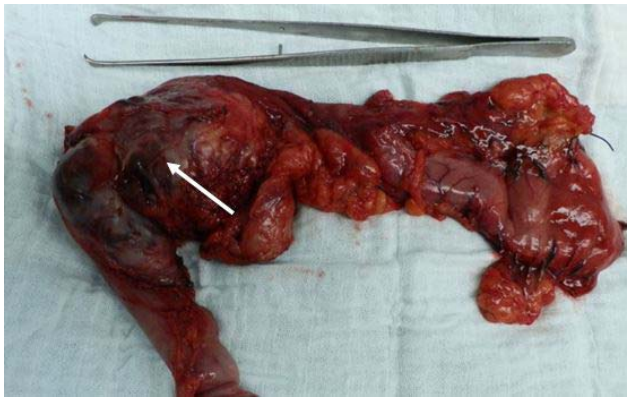

Fig. 2 – Tumor resection specimen, the duodenum, a part of the stomach, pancreatic head and the first jejunal limb (arrow shows the tumor in the second duodenal portion and the head of the pancreas).

No other findings were observed during the surgery. We performed the Whipple's procedure with one bore drain placement. Postoperatively, the patient presented with chylous ascites approximately 1,500 mL daily that diminished and resolved on the postoperative day 4 (Figure 4). However, on the postoperative day 6 a low-output external

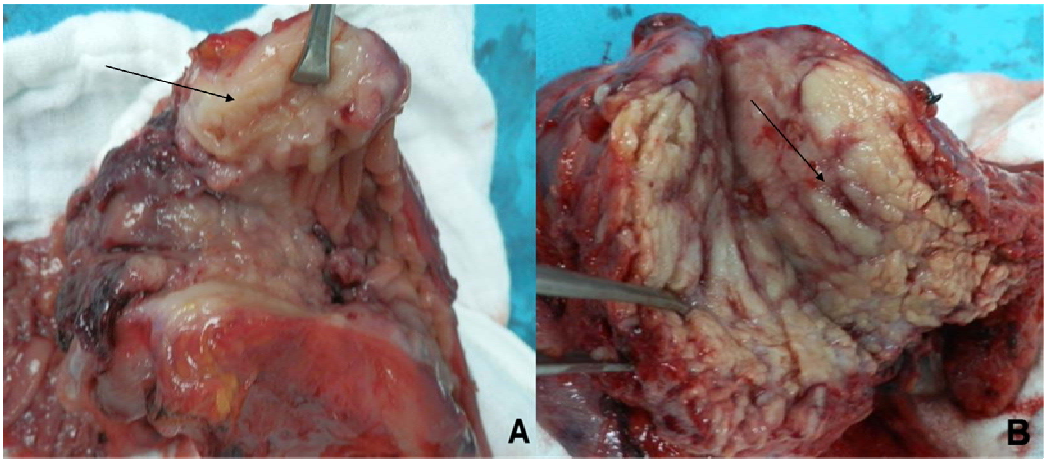

Fig. 3 – A) Longitudinally transected duodenum with infiltration in the duodenal wall by the tumor (arrow); B) The transected pancreatic head shows infiltration in the pancreas by the tumor (arrow).

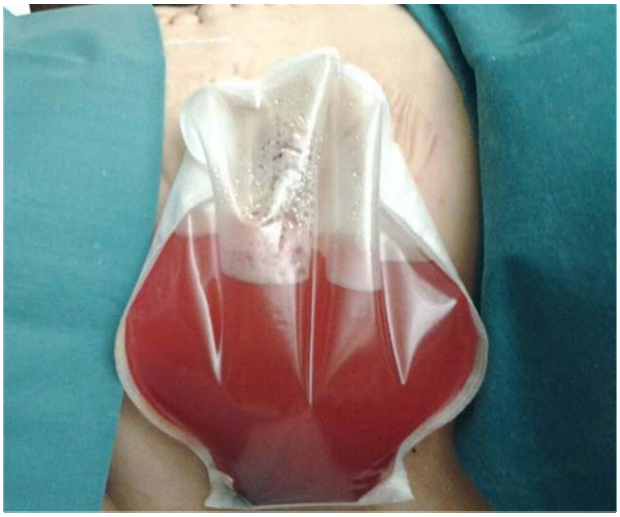

Fig. 4 – Chylous ascites in the drainage bag on the day 2 postoperatively.

pancreatic fistula occurred, and resolved during conservative treatment on the postoperative day 10. The postoperative treatment was based on the control of infection process and low-fat oral diet with medium-chain triglycerides after the introduction of *per* oral food intake on the day 5 after the surgery. The drain was removed on the postoperative day 12, and patient was discharged two weeks after the surgery.

Histopathological examination showed diffuse neoplastic proliferation of plasma cells in duodenal submucosa and pancreatic tissue, with tumor cells positivity for MUM-1, CD138 and λ light chain expression on immunohistochemical studies (Figure 5).

On follow-up 3 months later the patient had no gastrointestinal problems, disease recurrence, nor activity on positron emission tomography scan.

Discussion

The diagnostic criteria of EMPs are: 1) solitary plasma cell tumor; 2) histological confirmation; 3) normal bone marrow, taken from a distant site with less than 5% of plasma cells; and 4) low concentration of monoclonal paraprotein [1, 3]. The upper respiratory tract including oropharynx, nasopharynx, nasal cavity, sinuses and larynx are the most common sites of solitary EMPs. Approximately 7% of all solitary EMPs can be found in gastrointestinal tract [2, 3, 11]. The most affected organs include the stomach, small bowel, while the colon and esophagus are involved rarely [11]. There are only 11 cases in the literature with duodenal localization of solitary EMP, but only 3 cases with pancreas involvement and two cases with duodenal and pancreas involvement until now [4–14, 19]. In all described cases with solitary EMP involving both duodenum and pancreas or just pancreas, patients had obstructive jaundice that was not present in our case. In our patient a plasma cell infiltrate has spread in the area out of the Vater's ampulla and the main pancreatic duct, mainly in the anterior segments of pancreatic head what was the reason of the jaundice absence. However, nausea, pain, vomiting, upper gastrointestinal bleeding or weight loss occurred in almost all described cases. Also, the presented patient was the first one with upper gastrointestinal obstruction caused by EMPs. Excluding malignant tumors originating from the stomach, duodenum, pancreas and biliary tree there are not many pathological conditions reported to cause upper ileus [20].

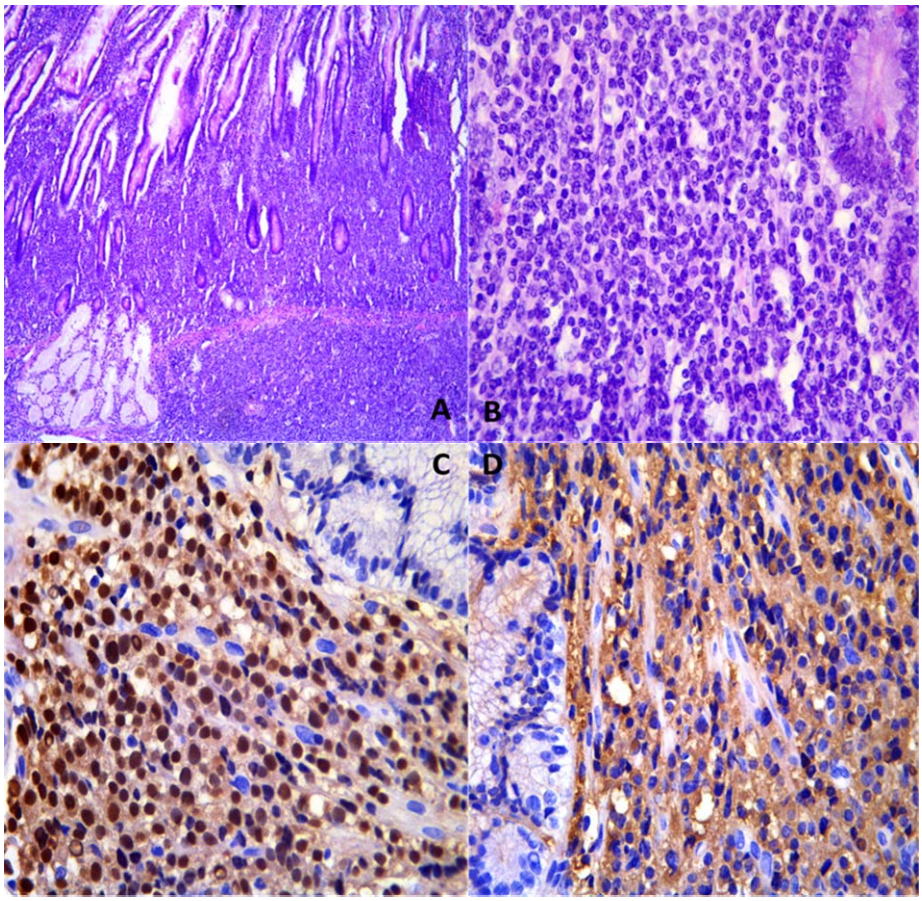

Fig. 5 – A, B) The tumor forms a submucosal duodenal nodule with diffuse proliferation of mildly pleomorphic plasma cells [(A) HE, × 10; B) HE, ×20)]; C) The tumors cells demonstrating strong diffuse positivity for MUM-1 (× 40); D) Diffuse cytoplasmic λ light chain expression in primary duodenal plasmacytoma and CD138 positivity (× 40).

The diagnosis of EMPs comprises in fact the exclusion of other two from plasmacytoma, both MM and MP. A localization and extent of the tumor could be evaluated by the radiological imaging procedures which include CT scan and magnetic resonance imaging. Interestingly, our case was the third reported with imaging of duodenal involvement by solitary EMPs in the literature data so far [14, 17]. The first case was published by Magagnoli et al. [17], and a recently published case by Karam et al. [14] was the second reported with imaging of duodenal localization of EMPs with the explanation that the most of the published cases appeared in gastroenterology journals. Therefore, our case was the first one reported with duodenal and pancreatic localization of solitary EMP with both imaging and specimen figures. With regard to neoplastic proliferation of plasma cells in the stomach, primary plasmacytoma should always be distinguished from the other lymphoproliferative disorders with plasmacytic differentiation. Immunohistochemical analysis of the resected specimen in the presented patient showed that tumor cells were diffusely CD138, MUM-1, and IgA positives, and CD5 negative.

Therapeutic strategies for solitary plasmacytoma and EMP include surgery, chemotherapy, radiotherapy, along with combined approaches [2]. Although it was showed that solitary plasmacytoma are highly chemoradiosensitive [3, 21, 22], many cases of EMP are reported to be insensitive to radiotherapy and chemotherapy [2, 19, 23]. In eligible patients, radiation therapy in the dose of 40–50 Gy has been suggested providing an excellent locoregional disease control [24]. However, in that study the majority of patients were with EMPs in the region of the neck and head, and in only two patients EMPs was localized in the abdominal cavity. A relatively small number of inconclusive data are available for analysis of the natural history and treatment for EMPs of the gastrointestinal tract. Some reported cases showed poor sensitivity of EMPs to radiochemotherapy [2, 19, 23], suggesting aggressive course of the disease. Others favor radiation therapy over chemotherapy in the treatment of solitary plasmacytoma [25], and in cases of extramedullary spread high dose chemotherapy followed by stem-cell transplantation have been suggested as standard treatment [11, 14]. However, it was considered that gastrointestinal involvement of MM has a very poor prognosis even with aggressive treatment [26], and surgical resection should be implemented only in cases with local complications by the mass itself [11]. As radiation therapy was used in the past for EMPs treatment, and the standard first line chemotherapy regimen for EMPs failed, in addition to occurrence of local complications in our patient, we decided to perform surgical intervention. In the literature data there are only few patients with EMP localized in the region of duodenum and pancreatic head who underwent surgery. Our case was the third patient

reported with EMP of this localization in whom radical pancreaticoduodenectomy (Whipple's procedure) was performed [4, 9]. In case of the three other patients, one was treated with local excision succumbing 15 months later to MM [7], the second one only with gastrointestinal by-pass without resection [5], whilst the third case was operated with no data regarding the surgical procedure [18].

The ascites and pleural effusion occur in approximately one-third of patients with plasma cell disorder. Those clinical features could be found solitary or as a part of POEMS or Crow-Fukase syndrome in patients with plasma cell disorders, predominantly in patients with MM [27]. The pathogenesis of this syndrome, mainly edema, pleural effusions and ascites development, is attributed to markedly increased plasma and serum levels of vascular endothelial growth factor (VEGF) in patients with MM. The VEGF is secreted from plasma cells and platelets promoting vascular permeability, angiogenesis and monocyte/macrophage migration. There are no literature data regarding etiopathogenesis of the ascites and/or pleural effusion occurrence in patients who underwent surgery for EMP although a case was reported with plasmacytoma of the ovary and stormy postoperative course complicated by rapidly refilling ascites and pleural effusion [28]. Such complications may be attributed to angiogenesis, especially to lymphangiogenesis, in the field of plasma cell disorder, VEGF hypersecretion and operative trauma. The drainage of chylous ascites in postoperative course burdened our patient also, however, it was diminished and resolved shortly after the surgery. Unfortunately, we had no possibility to evaluate the drainage fluid due to technical circumstances. In addition to the aforementioned case of plasmacytoma of the ovary, our patient was another with this unusual complication but the first one with duodenal localization of EMPs.

The most effective therapy for gastrointestinal EMPs cannot be determined from this small case series. It is obvious that some of these patients with duodenal plasmacytoma are insensitive to irradiation and/or chemotherapy, whereas surgery could provide local disease control not only in cases of complications. When the first line chemotherapy fails, surgical procedure should be considered timely to prevent the development of possible complications.

Conclusion

Solitary EMPs are rare tumors of plasma cell disorders and even more rarely with duodenal and pancreas involvement. The presented patient did not respond to chemotherapy and was operated on with success. The Whipple's procedure is the optimal surgical procedure in cases of EMPs in the duodenum and pancreas. Each patient with gastrointestinal EMPs should be considered separately and timely providing him/her an adequate treatment which can assure local disease control.

REFERENCES

1. *Swerdlow SH, Campo E, Harris NL, Jaffe ES, Pileri SA, Stein H,* et al. WHO Classification of Tumours of Haematopoietic and Lymphoid Tissues. Lyon: International Agency for Research on Cancer (IARC); 2008.
2. *Yoshida T, Soda K, Yamada S, Nakahara M, Nishida J, Kametaka M,* et al. Biclonal extramedullary plasmacytoma arising in the peritoneal cavity: report of a case. Surg Today 2004; 34(4): 379−82.
3. *Nolan KD, Mone MC, Nelson EW*. Plasma cell neoplasms. Review of disease progression and report of a new variant. Surg Oncol 2005; 14(2): 85−90.
4. *Schoretsanitis G, Livingstone JI, El-Japour JN , Watkins N, Wastell C*. Duodenal plasmacytoma: a rare extramedullary localization simulating carcinoma of the head of the pancreas. Postgrad Med J 1994; 70(823): 378−9.
5. *Hefferman A*. Plasmacytoma of pancreas and duodenum causing acute intestinal obstruction. Lancet 1947; 249(6461): 910.
6. *Derechin MM, Goldberg LS, Herron L*. Extraosseous Plasmacytomas Causing Extrahepatic Cholestasis and Cardiac Tamponade: A Unique Case of Multiple Myeloma. Scand J Haemtol 1970; 7(5): 318−21.
7. *Pentimone F, Camici M, Cini G, Levorato D*. Duodenal plasmacytoma. A rare primary extramedullary localization simulating a carcinoma. Acta Haematol 1979; 61(3): 155−60.
8. Hirakawa T, Fukuda Y, Tabata M, Hatanaka Y, Aihara K, Suzuki T, et al. Primary duodenal submucosal plasmacytoma - an autopsy case. Nihon Rinsho 1978; 36(9): 3278−9. (Japanese)
9. *Mannell A*. Primary isolated extramedullary plasmacytoma of the duodenum. Aust NZ J Surg 1979; 49(5): 577−80.
10. *Spalding DR, Isla AM, Thompson JN, Williamson RC*. Pancreas-sparing distal duodenectomy for infrapapillary neoplasms. Ann R Coll Surg Engl 2007; 89(2): 130−5.
11. *Telakis E, Tsironi E, Tavoularis G, Papatheodorou K, Tzaida O, Nikolaou A*. Gastrointestinal involvement in a patient with multiple myeloma: A case report. Ann Gastroenterol 2009; 22(4): 287−90.
12. *Gradishar W, Recant W, Shapiro C*. Obstructing plasmacytoma of the duodenum: first manifestation of relapsed multiple myeloma. Am J Gastroenterol 1988; 83(1): 77−9.
13. *Siddique I, Papadakis KA, Weber DM, Glober G*. Recurrent bleeding from a duodenal plasmacytoma treated successfully with embolization of the gastroduodenal artery. Am J Gastroenterol 1999; 94(6): 1691−2.
14. *Karam AR, Semaan RJ, Buch K, Shankar S*. Extramedullary duodenal plasmacytoma presenting with gastric outlet obstruction and painless jaundice. J Radiol Case Rep 2010; 4(8): 22−8.
15. *Carneiro FP, Sobreira MN, Maia LB, Sartorelli AC, Franceschi LE, Brandão MB,* et al. Extramedullary plasmocytoma associated with a massive deposit of amyloid in the duodenum. World J Gastroenterol 2009; 15(28): 3565−8.
16. *Fowell AJ, Poller DN, Ellis RD*. Diffuse luminal ulceration resulting from duodenal plasmacytoma. Gastrointest Endosc 2007; 65(4): 707−8.
17. *Magagnoli M, Pedicini V, Rahal D, Santoro A*. Solitary plasmacytoma of the duodenum. Am J Hematol 2004; 76(2): 185−6.
18. *Chen CH, Yang CC, Yeh YH, Kuo CL*. Duodenal plasmacytoma. Gastrointest Endosc 2001; 54(6): 753.
19. *Ali R, Ozkalemkas F, Ozcelik T, Ozkan A, Ozkocaman V, Ozturk H,* et al. Extramedullary plasmacytoma involving the abdominal vessels and pancreas. Dig Dis Sci 2007; 52(11): 3199−201.
20. *Bezmarević M, Mirković D, Perisić N, Cerović S, Panisić M, Micković S,* et al. Sclerosing mesenteritis as a rare cause of upper ileus. Vojnosanit Pregl 2013; 70(3): 326−30.
21. *Kadokura M, Tanio N, Nonaka M, Yamamoto S, Kataoka D, Kushima M,* et al. A surgical case of solitary plasmacytoma of rib

origin with biclonal gammopathy. Jpn J Clin Oncol 2000; 30(4): 191−5.
22. *Das-Gupta EP, Sidra GM, Bessell EM, Lush RJ, Byrne JL, Russell NH.* High-dose melphalan followed by radical radiotherapy for the treatment of massive plasmacytoma of the chest wall. Bone Marrow Transplant 2003; 32(8): 759−61.
23. *Damaj G, Mohty M, Vey N, Dincan E, Bouabdallah R, Faucher C,* et al. Features of extramedullary and extraosseous multiple myeloma: a report of 19 patients from a single center. Eur J Haematol 2004; 73(6): 402−6.
24. *Liebross RH, Ha CS, Cox JD, Weber D, Delasalle K, Alexanian R.* Clinical course of solitary extramedullary plasmacytoma. Radiother Oncol 1999; 52(3): 245−9.
25. *Hirata S, Yamaguchi K, Bandai S, Izumo A, Chijiiwa K, Tanaka M.* Secondary extramedullary plasmacytoma involving the pancreas. J Hepatobiliary Pancreat Surg 2002; 9(1): 111−5.
26. *Talamo G, Cavallo F, Zangari M, Barlogie B, Lee C, Pineda-Roman M,* et al. Clinical and biological features of multiple myeloma involving the gastrointestinal system. Haematologica 2006; 91(7): 964−7.
27. *Dispenzieri A, Gertz MA.* POEMS syndrome. Orphanet encyclopedia. Available from: http://www.orpha.net/data/patho/GB/uk-POEMS.pdf. [cited 2005 June 10].
28. *Shakuntala P, Praveen S, Shankaranand B, Rajshekar K, Umadevi K, Bafna U.* A rare case of plasmacytoma of the ovary: A case report and literature review. Ecancermedicalscience 2013; 7: 288.

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