

World Journal of *Clinical Cases*

World J Clin Cases 2020 December 26; 8(24): 6213-6545



MINIREVIEWS

- 6213 Role of gut microbiome in regulating the effectiveness of metformin in reducing colorectal cancer in type 2 diabetes

Huang QY, Yao F, Zhou CR, Huang XY, Wang Q, Long H, Wu QM

ORIGINAL ARTICLE

Retrospective Cohort Study

- 6229 Impact factors of lymph node retrieval on survival in locally advanced rectal cancer with neoadjuvant therapy

Mei SW, Liu Z, Wang Z, Pei W, Wei FZ, Chen JN, Wang ZJ, Shen HY, Li J, Zhao FQ, Wang XS, Liu Q

Retrospective Study

- 6243 Three-year follow-up of Coats disease treated with conbercept and 532-nm laser photocoagulation

Jiang L, Qin B, Luo XL, Cao H, Deng TM, Yang MM, Meng T, Yang HQ

- 6252 Virus load and virus shedding of SARS-CoV-2 and their impact on patient outcomes

Chen PF, Yu XX, Liu YP, Ren D, Shen M, Huang BS, Gao JL, Huang ZY, Wu M, Wang WY, Chen L, Shi X, Wang ZQ, Liu YX, Liu L, Liu Y

- 6264 Risk factors for *de novo* hepatitis B during solid cancer treatment

Sugimoto R, Furukawa M, Senju T, Aratake Y, Shimokawa M, Tanaka Y, Inada H, Noguchi T, Lee L, Miki M, Maruyama Y, Hashimoto R, Hisano T

- 6274 Cause analysis and reoperation effect of failure and recurrence after epiblepharon correction in children

Wang Y, Zhang Y, Tian N

Clinical Trials Study

- 6282 Effects of different acupuncture methods combined with routine rehabilitation on gait of stroke patients

Lou YT, Yang JJ, Ma YF, Zhen XC

Observational Study

- 6296 Application of endoscopic submucosal dissection in duodenal space-occupying lesions

Li XY, Ji KY, Qu YH, Zheng JJ, Guo YJ, Zhang CP, Zhang KP

- 6306 Early renal injury indicators can help evaluate renal injury in patients with chronic hepatitis B with long-term nucleos(t)ide therapy

Ji TT, Tan N, Lu HY, Xu XY, Yu YY

Prospective Study

- 6315** Neoadjuvant chemoradiotherapy plus surgery in the treatment of potentially resectable thoracic esophageal squamous cell carcinoma
Yan MH, Hou XB, Cai BN, Qu BL, Dai XK, Liu F

CASE REPORT

- 6322** Uterine rupture in patients with a history of multiple curettages: Two case reports
Deng MF, Zhang XD, Zhang QF, Liu J
- 6330** Pleural effusion and ascites in extrarenal lymphangiectasia caused by post-biopsy hematoma: A case report
Lin QZ, Wang HE, Wei D, Bao YF, Li H, Wang T
- 6337** Eighty-year-old man with rare chronic neutrophilic leukemia caused by CSF3R T618I mutation: A case report and review of literature
Li YP, Chen N, Ye XM, Xia YS
- 6346** Sigmoid colon duplication with ectopic immature renal tissue in an adult: A case report
Namgung H
- 6353** Paraplegia from spinal intramedullary tuberculosis: A case report
Qu LM, Wu D, Guo L, Yu JL
- 6358** Confocal laser endomicroscopy distinguishing benign and malignant gallbladder polyps during choledochoscopic gallbladder-preserving polypectomy: A case report
Tang BF, Dang T, Wang QH, Chang ZH, Han WJ
- 6364** Sclerosing stromal tumor of the ovary with masculinization, Meig's syndrome and CA125 elevation in an adolescent girl: A case report
Chen Q, Chen YH, Tang HY, Shen YM, Tan X
- 6373** Primary pulmonary malignant melanoma diagnosed with percutaneous biopsy tissue: A case report
Xi JM, Wen H, Yan XB, Huang J
- 6380** SRY-negative 45,X/46,XY adult male with complete masculinization and infertility: A case report and review of literature
Wu YH, Sun KN, Bao H, Chen YJ
- 6389** Refractory case of ulcerative colitis with idiopathic thrombocytopenic purpura successfully treated by Janus kinase inhibitor tofacitinib: A case report
Komeda Y, Sakurai T, Sakai K, Morita Y, Hashimoto A, Nagai T, Hagiwara S, Matsumura I, Nishio K, Kudo M
- 6396** Immunotherapies application in active stage of systemic lupus erythematosus in pregnancy: A case report and review of literature
Xiong ZH, Cao XS, Guan HL, Zheng HL

- 6408** Minimally invasive maxillary sinus augmentation with simultaneous implantation on an elderly patient: A case report
Yang S, Yu W, Zhang J, Zhou Z, Meng F, Wang J, Shi R, Zhou YM, Zhao J
- 6418** Congenital nephrogenic diabetes insipidus due to the mutation in *AVPR2* (c.541C>T) in a neonate: A case report
Lin FT, Li J, Xu BL, Yang XX, Wang F
- 6425** Primary gastric melanoma in a young woman: A case report
Long GJ, Ou WT, Lin L, Zhou CJ
- 6432** Extreme venous letting and cupping resulting in life-threatening anemia and acute myocardial infarction: A case report
Jang AY, Suh SY
- 6437** Novel conservative treatment for peritoneal dialysis-related hydrothorax: Two case reports
Dai BB, Lin BD, Yang LY, Wan JX, Pan YB
- 6444** Clinical characteristics of pulmonary cryptococcosis coexisting with lung adenocarcinoma: Three case reports
Zheng GX, Tang HJ, Huang ZP, Pan HL, Wei HY, Bai J
- 6450** Fracture of the scapular neck combined with rotator cuff tear: A case report
Chen L, Liu CL, Wu P
- 6456** Synchronous colonic mucosa-associated lymphoid tissue lymphoma found after surgery for adenocarcinoma: A case report and review of literature
Li JJ, Chen BC, Dong J, Chen Y, Chen YW
- 6465** Novel mutation in the *ASXL3* gene in a Chinese boy with microcephaly and speech impairment: A case report
Li JR, Huang Z, Lu Y, Ji QY, Jiang MY, Yang F
- 6473** Recurrent thrombosis in the lower extremities after thrombectomy in a patient with polycythemia vera: A case report
Jiang BP, Cheng GB, Hu Q, Wu JW, Li XY, Liao S, Wu SY, Lu W
- 6480** Status epilepticus as an initial manifestation of hepatic encephalopathy: A case report
Cui B, Wei L, Sun LY, Qu W, Zeng ZG, Liu Y, Zhu ZJ
- 6487** Delayed diagnosis of prosopagnosia following a hemorrhagic stroke in an elderly man: A case report
Yuan Y, Huang F, Gao ZH, Cai WC, Xiao JX, Yang YE, Zhu PL
- 6499** Oral myiasis after cerebral infarction in an elderly male patient from southern China: A case report
Zhang TZ, Jiang Y, Luo XT, Ling R, Wang JW
- 6504** Rare case of drain-site hernia after laparoscopic surgery and a novel strategy of prevention: A case report
Gao X, Chen Q, Wang C, Yu YY, Yang L, Zhou ZG

- 6511** Extracorporeal shock wave therapy treatment of painful hematoma in the calf: A case report
Jung JW, Kim HS, Yang JH, Lee KH, Park SB
- 6517** Takotsubo cardiomyopathy associated with bronchoscopic operation: A case report
Wu BF, Shi JR, Zheng LR
- 6524** Idiopathic adulthood ductopenia with elevated transaminase only: A case report
Zhang XC, Wang D, Li X, Hu YL, Wang C
- 6529** Successful endovascular treatment with long-term antibiotic therapy for infectious pseudoaneurysm due to *Klebsiella pneumoniae*: A case report
Wang TH, Zhao JC, Huang B, Wang JR, Yuan D
- 6537** Primary duodenal tuberculosis misdiagnosed as tumor by imaging examination: A case report
Zhang Y, Shi XJ, Zhang XC, Zhao XJ, Li JX, Wang LH, Xie CE, Liu YY, Wang YL

ABOUT COVER

Peer-Reviewer of *World Journal of Clinical Cases*, Dr. Adonis Protopapas is a gastroenterology Resident at the first Propaedeutic Department of Internal Medicine of the Aristotle University of Thessaloniki (Greece), located at the A.H.E.P.A Hospital. He earned his Bachelor's degree in 2015 from the Democritus University of Thrace, followed by three Master's of Science degrees, with specializations in clinic pharmacology, medical research methodology, and healthcare management. His research interests are mainly focused on the area of hepatology, although he also participates in various projects related to endoscopy and inflammatory bowel disease. He is particularly fascinated by research on cirrhosis and its complications. (L-Editor: Filipodia)

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Primary gastric melanoma in a young woman: A case report

Guo-Jie Long, Wen-Ting Ou, Lin Lin, Cai-Jin Zhou

ORCID number: Guo-Jie Long 0000-0002-0364-3955; Wen-Ting Ou 0000-0003-3090-8522; Lin Lin 0000-0002-2961-9603; Cai-Jin Zhou 0000-0003-0951-9127.

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Guo-Jie Long, Department of Gastrointestinal Surgery, Affiliated Hospital of Guangdong Medical University, Zhanjiang 524002, Guangdong Province, China

Wen-Ting Ou, Department of Oncology, Affiliated Hospital of Guangdong Medical University, Zhanjiang 524002, Guangdong Province, China

Lin Lin, Cai-Jin Zhou, Department of Gastrointestinal Surgery, Affiliated Hospital of Guangdong Medical University, , Zhanjiang 524002, Guangdong Province, China

Corresponding author: Cai-Jin Zhou, Professor, Department of Gastrointestinal Surgery, Affiliated Hospital of Guangdong Medical University, No. 57 South Renmin Avenue, Xiashan District, Zhanjiang 524002, Guangdong Province, China. zhoucaipingren@163.com

Abstract

BACKGROUND

Most melanomas identified in the stomach are metastatic. The primary gastric melanoma (PGM) is extremely rare. As such, clinical reports of PGM are scarce in the literature, lending to the challenge of diagnosis and treatment.

CASE SUMMARY

A 31-year-old woman presented with a 1-mo history of dysphagia but no symptoms of abdominal pain, abdominal distension, nausea, vomiting, hematemesis, or melena. The patient reported an unintentional weight loss of 6 kg within that time. History-taking revealed no previous medical conditions or surgical events. Abdominal computed tomography at a local hospital had suggested gastric tumor. Endoscopic examination in our hospital found a large, irregular, black mass. Subsequent laparoscopic exploration found the tumor on the side of the stomach fundus penetrating through the serosa, and enlarged lymph nodes (groups 1, 3, 7, and 9) fused into a mass, surrounding the peripheral artery and inseparable. Postoperative immunohistochemistry suggested gastric malignant melanoma. Positron emission tomography-computed tomography confirmed PGM. Treatment with programmed cell death protein 1 antagonist (toripalimab) plus chemotherapy (paclitaxel) was initiated but discontinued upon tumor bleeding. At the last telephone follow-up, the patient reported poor general condition but was alive.

CONCLUSION

Although unresolved and ongoing, this rare case of PGM expands the overall knowledge about this rare tumor's diagnosis and management.

Key Words: Primary gastric melanoma; Pathogenesis; Diagnosis; Treatment; Prognosis;

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Case report

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Core Tip: Primary gastric melanoma (PGM) is a rare malignant tumor, and there is a lack of clinical data in the literature. We describe a case of PGM presenting with dysphagia and unintentional weight loss, which was confirmed by immunohistochemistry and positron emission tomography-computed tomography. We also review the literature, summarizing and discussing the limited knowledge on PGM pathogenesis, clinical manifestations, diagnosis, treatment and prognosis.

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INTRODUCTION

Melanomas are malignant tumors that develop from melanocytes. Although they usually occur in the skin, oropharynx, and eyes, rare cases have been reported in the digestive tract, involving the esophagus, stomach, and intestines^[1]. Melanoma of the gastrointestinal tract is generally considered to be metastatic, and it has been reported that up to 4% of patients with cutaneous melanoma have clinical gastrointestinal tract involvement antemortem and up to 60% at autopsy^[2].

The concept of primary gastrointestinal melanoma (PGIM) is controversial, and it remains unknown whether the absence of primary skin lesions is merely due to spontaneous regression. Nevertheless, reports of cases of PGIMs without primary skin lesions are increasing in the literature^[1,3,4], supporting the theory of PGIMs being a distinctive entity. Cheung *et al*^[5] reviewed 659 PGIMs that had been reported from 1973 to 2004, and calculated an annual incidence of approximately 0.47 cases per million in 2000. They noted that the incidence of PGIM tumors was greatest in the oral-nasopharynx (32.8%), anal canal (31.4%), and rectum (22.2%), with rarer instances in the esophagus (5.9%), stomach (2.7%), small bowel (2.3%), gallbladder (1.4%), and large bowel (0.9%). Correspondingly, knowledge of the pathogenic course and clinical management of PGIM in the low-incidence sites, such as stomach (*i.e.*, primary gastric melanoma, PGM), is lacking.

Here, we report a case of PGM to raise awareness of these rare tumors and enhance the overall knowledge for improving diagnosis and treatment of these tumors.

CASE PRESENTATION

Chief complaints

A 31-year-old woman was admitted to our hospital on December 19, 2019, with a chief complaint of dysphagia.

History of present illness

The patient reported a 1-mo history of dysphagia but denied experiencing any instances of abdominal pain, abdominal distension, nausea, vomiting, hematemesis, or melena. However, the patient reported an unintentional weight loss of 6 kg over the past month.

History of past illness

The patient's past medical and surgical histories were negative.

Personal and family history

The patient's personal and family histories were negative.

Physical examination

Cardiopulmonary and abdominal physical examinations showed no abnormalities.

Laboratory examinations

Serum levels of the carcinoembryonic antigen, cancer antigen-199 and cancer antigen-153 tumor markers were within normal ranges. Liver and kidney function markers and electrolytes were all within normal ranges.

Imaging examinations

A computed tomography (CT) scan performed at a local hospital (before the patient was admitted to our hospital) had suggested a gastric tumor. Endoscopic examination at our hospital showed a large, irregular, black mass extending from the posterior wall of the cardia to the posterior wall and left lateral wall of the gastric fundus. The mass had unclear boundaries and was prone to bleeding when touched ([Figure 1](#)).

FINAL DIAGNOSIS

Based on the patient's previous medical history and current positron emission tomography/computed tomography (PET-CT) findings, there was no additional malignant melanoma at any other site. Therefore, a clinical diagnosis of PGM was made.

TREATMENT

Following standard preoperative preparation, the patient underwent laparoscopic exploration on day 3 after admission. The tumor was visualized at the side of the stomach fundus and found penetrating through the serosa. No metastases were observed in the liver, omentum, or abdominal wall. However, enlarged lymph nodes (in groups 1, 3, 7, and 9) were found to be fused into a mass, surrounding the peripheral artery; the mass was inseparable. The intraoperative findings suggested a diagnosis of gastric lymphoma, and the operation was performed after obtaining a few tissue specimens for pathological examination.

The intraoperative and endoscopic pathology findings suggested malignant melanoma of the stomach. Immunohistochemical analysis of the specimens showed a staining profile of CD79a (-), CK (-), cyclinD1 (+), HMB45 (+), ki-67 (60%+), LCA (-), MDM2 (+), melan-A (+), P16 (-), and S-100 (+) ([Figure 2](#)). We inquired the patient's medical history again and confirmed that the patient had no history of cutaneous melanoma and melanoma resection. To confirm the metastasis of the tumor, the patient underwent PET-CT, which showed the gastric wall to be remarkably thickened and the glucose metabolism to be substantially increased. The gastric cancer (T4) tissue was found to have invaded the pancreatic tail and surrounding soft tissue; in addition, the perigastric omentum and mesentery showed signs of invasion or metastasis from the tumor. No other lesions were observed ([Figure 3](#)).

After full communication with the patient's family, the treatment strategy of programmed cell death protein 1 (PD-1) antagonist (toripalimab) + chemotherapy (paclitaxel) was initiated.

OUTCOME AND FOLLOW-UP

Gastrointestinal bleeding occurred in the fourth cycle of treatment, which was relieved by conservative management. Nevertheless, the patient and her family refused to continue the treatment. Systemic CT scan after the stage 4 chemotherapy ([Figure 4](#)) indicated that there was no significant change in tumor size and no metastasis to other new organs. The last telephone follow-up was on July 1, 2020. The patient was alive, but still experiencing symptoms of gastrointestinal bleeding and poor general condition.

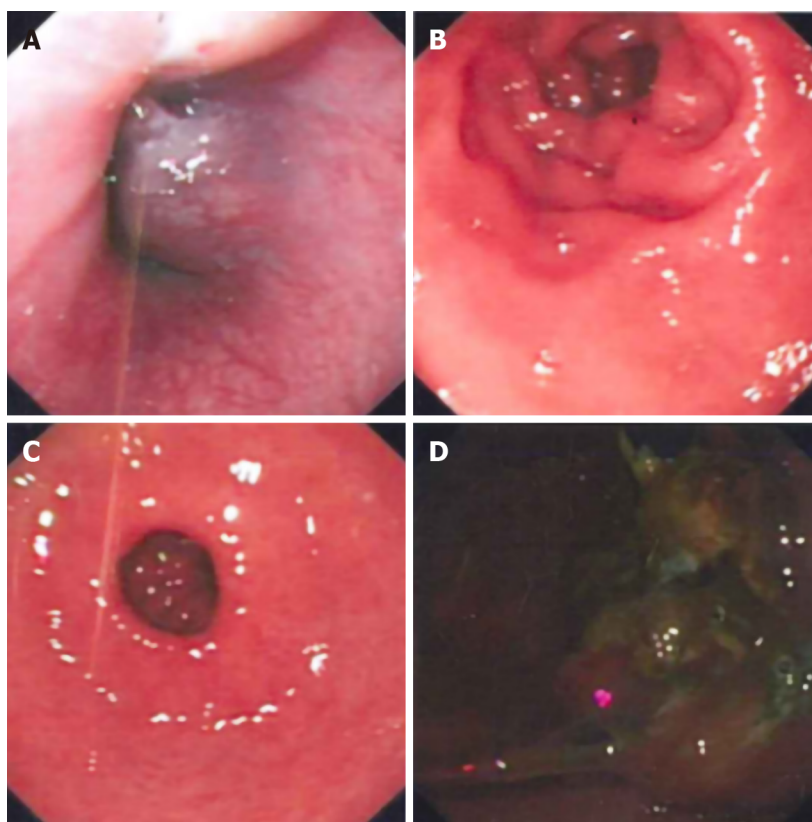


Figure 1 Gastroscopic images. A-C: Representative views of the normal gastric mucosa; D: View of the irregular mass, with a black coloration (pigmentation) on the surface, that was prone to bleeding when touched.

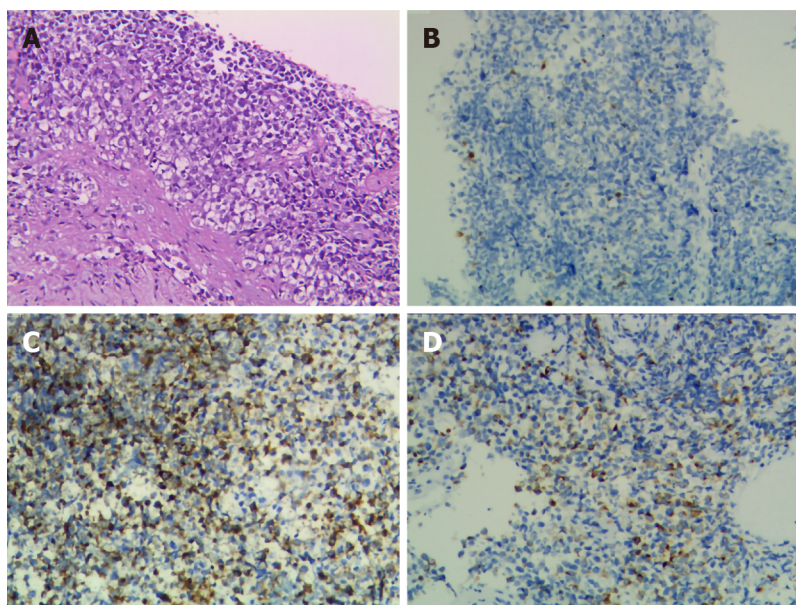


Figure 2 Pathologic results. A: Representative images of tumor cells. Hematoxylin and eosin stain. Magnification: $\times 100$; B: Immunohistochemical staining showed that the tumor was positive for S-100; C: For HMB-45; D: For melan-A.

DISCUSSION

PGM is a rare malignant tumor, which should meet two criteria for diagnosis: (1) immunohistochemistry of the tumor being consistent with the immunohistochemistry of melanoma, and positivity for S-100, HMB45 and melan-A; and (2) no history of skin melanoma or skin melanoma resection. However, it is difficult to distinguish metastatic melanoma with spontaneous regression of the primary site from PGM^[6]. We

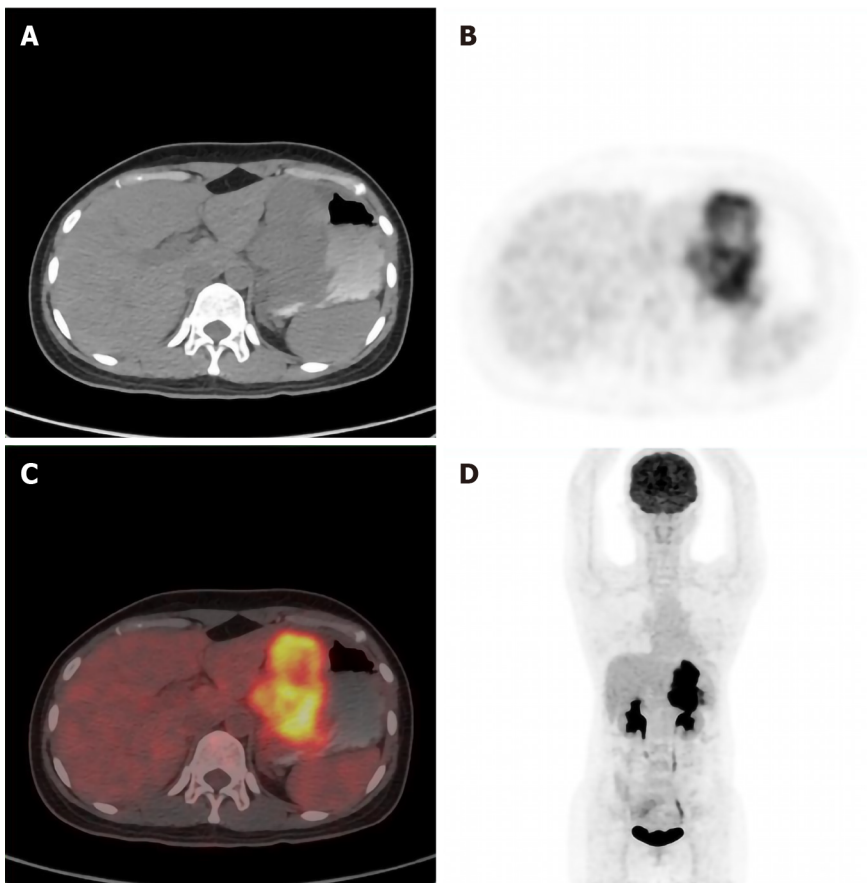


Figure 3 Whole body positron emission tomography-computed tomography showing tumor in the stomach only, with no other primary lesions. A: Plain computed tomography (CT) scan of the abdomen; B: Abdominal positron emission tomography (PET)-CT; C: Fusion diagram of the scan shown in A and B. Color overlay shows the tracer uptake; D: Whole body coronal PET-CT. The gastric wall was markedly thickened and the glucose metabolism to be substantially increased. A large amount of metabolic radioactive concentration was seen in the bladder.

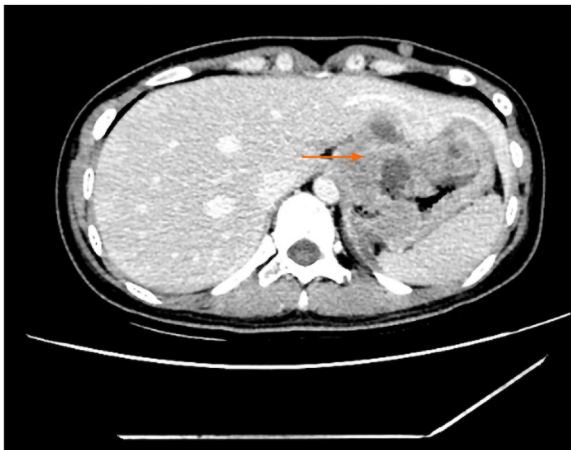


Figure 4 Computed tomography after the fourth chemotherapy cycle. Necrosis appeared in the middle of the tumor (arrow).

inferred that metastatic melanoma with spontaneous regression of the primary lesion would be multifocal or that metastatic lesions would also occur in other organs. In our case, however, the PET-CT scan found lesions in the stomach only, and the patient denied any related skin history. The final diagnosis of PGM was thus made.

The pathogenesis of PGM remains poorly understood. While some studies have found melanocytes in the anal canal and esophagus^[7,8], no studies to date have found melanocytes in the stomach. So, where do the malignant melanocytes come from? Two mechanisms have been proposed. Firstly, melanocytes from other sites, such as the anal canal and esophagus, would migrate into the stomach and become malignant in a

new tissue environment^[3,9]. Secondly, neural crest derivatives, such as amine-precursor uptake and decarboxylation cells, may gain or retain the ability to dedifferentiate into melanocytes and subsequently undergo malignant transformation^[10]. It is generally believed that ultraviolet radiation is the main cause of skin malignant melanoma, but some sites of melanoma have never been exposed to ultraviolet rays, such as the digestive tract. Therefore, it is not unreasonable to consider that other factors, such as genetics, immune factors or viral infection, may also play a role in the development of malignant melanoma, especially those not exposed to ultraviolet radiation. We hypothesized that the skin releases a cytokine into the blood circulation due to the effect of sunlight on the exposed area, affecting the melanocytes in the non-exposed areas of the body and resulting in malignant transformation; this theory will need to be confirmed by further studies.

The clinical manifestations of PGM are similar to other common gastric tumors and lack specificity. In our case, dysphagia and wasting were the main clinical manifestations. For the case reported by Wang *et al*^[1], the patient presented with recurrent chest tightness and chest pain as the initial symptoms. Both of the cases reported by Augustyn *et al*^[3] and Bolzacchini *et al*^[4] were hospitalized in an emergency with gastrointestinal bleeding. Therefore, PGM is occult at onset and lacks specific and obvious symptoms and signs in the early stage. B-ultrasonography, gastrointestinal angiography, and CT only showed gastric mass without obvious specificity.

Melanoma produces a paramagnetic substance called melanin; melanin-containing melanoma is indicated by hyperintensity on T1WI and hypointensity on T2WI in magnetic resonance imaging (MRI). PGM is a malignant tumor with abundant blood supply. On diffusion-weighted imaging, the tumor demonstrates a considerably high signal intensity. Thus, MRI is very helpful in the diagnosis of PGM and is even considered as the gold-standard preoperative assessment technique^[1]. However, MRI is expensive and rarely used in physical examination. Early diagnosis of such tumors requires endoscopy and tissue biopsy. The manifestations of PGM under endoscopy are mostly isolated eminence lesions, or multiple small lesions, with or without melanin pigmentation, which bleed easily upon contact. Immunohistochemistry mainly shows positivity for HMB45 and S-100. In our case, black coloration was observed on the tumor surface during endoscopy, but the pigmentation was not considered in the diagnosis. During the surgical exploration, numerous enlarged lymph nodes were seen and determined to be fused into a mass. The diagnosis of gastric malignant lymphoma was considered. Gastric melanoma was not confirmed until immunohistochemical results were reported. This clinical course to diagnosis may serve as a profile to alert healthcare teams to the possibility of this type of tumor upon detection of gastric tumor pigmentation during endoscopy.

PGM is a mucosal melanoma, which is more aggressive and associated with a worse prognosis than cutaneous melanoma. This may be due to the general delay in diagnosis, the inherently more aggressive melanoma behavior, or earlier dissemination *via* the lymphatic and vascular supply of the gastrointestinal tract^[11]. In 2009, the American Joint Committee on Cancer introduced a new classification for melanoma of the upper aerodigestive tract^[12]. In this classification, T1 and T2 as well as Stage I and Stage II have been removed due to the aggressive nature of mucosal melanomas. Thus, our case was classified as Stage IVA (T4aN1M0).

Because the disease is rare, no standard treatment based on staging has been proposed. For early PGM, surgical resection is still recommended and the range of resection should be no less than that of gastric cancer. In the case reported by Wang *et al*^[13], postoperative adjuvant chemoradiotherapy was not given after tumor resection, and the patient developed metastasis at 1 mo after surgery, and died of multiple metastases in the abdominal cavity at 2 mo after surgery. Therefore, the authors strongly recommended postoperative adjuvant chemoradiotherapy. However, it is currently believed that melanoma is not sensitive to radiotherapy and chemotherapy, and targeted therapy and immunotherapy are more commonly used^[4]. Our case was treated with a PD-1 inhibitor (toripalimab) combined with paclitaxel and the tumor did not continue to grow nor was there any additional metastasis. Unfortunately, the patient eventually developed tumor bleeding and was forced to suspend treatment.

Among all the PGIM, PGM has the shortest median survival (5 mo)^[5]. The treatment for PGM is still a comprehensive strategy based on surgery. The immune mechanism may play an important role in the spontaneous regression of malignant melanoma. Therefore, in the future, finding new immune drugs and new gene targets will be an important direction for improving the treatment of this rare tumor type.

CONCLUSION

We here report a rare case of PGM. We also review the related literature to summarize and consider the overall current knowledge on the diagnosis, incidence, pathogenesis, clinical manifestations, treatment, and prognosis of PGM.

REFERENCES

- 1 **Wang J**, Yang F, Ao WQ, Liu C, Zhang WM, Xu FY. Primary gastric melanoma: A case report with imaging findings and 5-year follow-up. *World J Gastroenterol* 2019; **25**: 6571-6578 [PMID: 31802836 DOI: 10.3748/wjg.v25.i44.6571]
- 2 **Patel JK**, Didolkar MS, Pickren JW, Moore RH. Metastatic pattern of malignant melanoma. A study of 216 autopsy cases. *Am J Surg* 1978; **135**: 807-810 [PMID: 665907 DOI: 10.1016/0002-9610(78)90171-x]
- 3 **Augustyn A**, de Leon ED, Yopp AC. Primary gastric melanoma: case report of a rare malignancy. *Rare Tumors* 2015; **7**: 5683 [PMID: 25918612 DOI: 10.4081/rt.2015.5683]
- 4 **Bolzacchini E**, Marcon I, Bernasconi G, Pinotti G. Primary melanoma of the stomach treated by BRAF inhibitor and immunotherapy. *Dig Liver Dis* 2016; **48**: 974 [PMID: 27158123 DOI: 10.1016/j.dld.2016.04.002]
- 5 **Cheung MC**, Perez EA, Molina MA, Jin X, Gutierrez JC, Franceschi D, Livingstone AS, Koniaris LG. Defining the role of surgery for primary gastrointestinal tract melanoma. *J Gastrointest Surg* 2008; **12**: 731-738 [PMID: 18058185 DOI: 10.1007/s11605-007-0417-3]
- 6 **Bulkley GB**, Cohen MH, Banks PM, Char DH, Ketcham AS. Long-term spontaneous regression of malignant melanoma with visceral metastases. Report of a case with immunologic profile. *Cancer* 1975; **36**: 485-494 [PMID: 1157014 DOI: 10.1002/1097-0142(197508)36:2<485::aid-cnrcr2820360227>3.0.co;2-m]
- 7 **DE LA PAVA S**, NIGOGOSYAN G, PICKREN JW, CABRERA A. Melanosis of the esophagus. *Cancer* 1963; **16**: 48-50 [PMID: 14025842 DOI: 10.1002/1097-0142(196301)16:1<48::aid-cnrcr2820160107>3.0.co;2-m]
- 8 **Clemmensen OJ**, Fenger C. Melanocytes in the anal canal epithelium. *Histopathology* 1991; **18**: 237-241 [PMID: 2045074 DOI: 10.1111/j.1365-2559.1991.tb00831.x]
- 9 **Horowitz M**, Nobrega MM. Primary anal melanoma associated with melanosis of the upper gastrointestinal tract. *Endoscopy* 1998; **30**: 662-665 [PMID: 9826150 DOI: 10.1055/s-2007-1001373]
- 10 **Krausz MM**, Ariel I, Behar AJ. Primary malignant melanoma of the small intestine and the APUD cell concept. *J Surg Oncol* 1978; **10**: 283-288 [PMID: 29168 DOI: 10.1002/jso.2930100402]
- 11 **Castro C**, Khan Y, Awasum M, Belostocki K, Rosenblum G, Belilos E, Carsons S. Case report: primary gastric melanoma in a patient with dermatomyositis. *Am J Med Sci* 2008; **336**: 282-284 [PMID: 18794626 DOI: 10.1097/MAJ.0b013e318159cc21]
- 12 Edge SB, Byrd DR, Carducci MA, Compton CC, Fritz AG, Greene F, Trotti A. American Joint Commission on Cancer (AJCC): Cancer Staging Manual. 7th ed. New York: Springer, 2009
- 13 **Wang L**, Zong L, Nakazato H, Wang WY, Li CF, Shi YF, Zhang GC, Tang T. Primary advanced esophago-gastric melanoma: A rare case. *World J Gastroenterol* 2016; **22**: 3296-3301 [PMID: 27004009 DOI: 10.3748/wjg.v22.i11.3296]



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