MINIREVIEWS

4688 Relationship between non-alcoholic fatty liver disease and coronary heart disease
   Arslan U, Yenerçağ M

ORIGINAL ARTICLE

Retrospective Cohort Study

4700 Remission of hepatotoxicity in chronic pulmonary aspergillosis patients after lowering trough concentration of voriconazole
   Teng GJ, Bai XR, Zhang L, Liu HJ, Nie XH

Retrospective Study

4708 Endoscopic submucosal dissection as alternative to surgery for complicated gastric heterotopic pancreas
   Noh JH, Kim DH, Kim SW, Park YS, Na HK, Ahn JY, Jung KW, Lee JH, Choi KD, Song HJ, Lee GH, Jung HY

4719 Observation of the effects of three methods for reducing perineal swelling in children with developmental hip dislocation

4726 Predictive value of serum cystatin C for risk of mortality in severe and critically ill patients with COVID-19
   Li Y, Yang S, Peng D, Zhu HM, Li BY, Yang X, Sun XL, Zhang M

4735 Sleep quality of patients with postoperative glioma at home
   Huang Y, Jiang ZJ, Deng J, Qi YJ

4743 Early complications of preoperative external traction fixation in the staged treatment of tibial fractures: A series of 402 cases
   Yang JZ, Zhu WB, Li LB, Dong QR

4753 Retroperitoneal vs transperitoneal laparoscopic lithotripsy of 20-40 mm renal stones within horseshoe kidneys

4763 Undifferentiated embryonal sarcoma of the liver: Clinical characteristics and outcomes
   Zhang C, Jia CJ, Xu C, Sheng QJ, Dou XG, Ding Y

4773 Cerebral infarct secondary to traumatic internal carotid artery dissection
   Wang GM, Xue H, Guo ZJ, Yu JL

4785 Home-based nursing for improvement of quality of life and depression in patients with postpartum depression
   Zhuang CY, Lin SY, Cheng CJ, Chen XJ, Shi HL, Sun H, Zhang HY, Fu MA
Contents

**Observational Study**

4793 Cost-effectiveness of lutetium (\(^{177}\)Lu) oxodotreotide vs everolimus in gastroenteropancreatic neuroendocrine tumors in Norway and Sweden
Pamela J, Leeuwenkamp OR

4807 Factors related to improved American Spinal Injury Association grade of acute traumatic spinal cord injury

4816 Intraperitoneal systemic vascular resistance is associated with postoperative nausea and vomiting after laparoscopic hysterectomy

**META-ANALYSIS**

4826 Underwater vs conventional endoscopic mucosal resection in treatment of colorectal polyps: A meta-analysis
Ni DQ, Lu YP, Liu XQ, Gao LY, Huang X

**CASE REPORT**

4838 Dehydrated patient without clinically evident cause: A case report
Palladino F, Fedele MC, Casertano M, Liguori L, Esposito T, Guarino S, Miraglia del Giudice E, Marzuillo P

4844 Intracranial malignant solitary fibrous tumor metastasized to the chest wall: A case report and review of literature
Usuda D, Yamada S, Izumida T, Sangen R, Higashikawa T, Nakagawa K, Iguchi M, Kasamaki Y

4853 End-of-life home care of an interstitial pneumonia patient supported by high-flow nasal cannula therapy: A case report
Goda K, Kenzaka T, Kuriyama K, Hoshijima M, Akita H

4858 Rupture of carotid artery pseudoaneurysm in the modern era of definitive chemoradiation for head and neck cancer: Two case reports
Kim M, Hong JH, Park SK, Kim SJ, Lee JH, Byun J, Ko YH

4866 Unremitting diarrhoea in a girl diagnosed anti-N-methyl-D-aspartate-receptor encephalitis: A case report
Onpooaree N, Veeravigrom M, Sanpavat A, Suratannnon N, Sintusek P

4876 Paliperidone palmitate-induced facial angioedema: A case report
Srisuengfung M, Sukakul T, Liangcheep C, Viravan N

4883 Improvement of lenvatinib-induced nephrotic syndrome after adaptation to sorafenib in thyroid cancer: A case report
Yang CH, Chen KT, Lin YS, Hsu CY, Ou YC, Tung MC

4895 Adult metaplastic hutch diverticulum with robotic-assisted diverticulectomy and reconstruction: A case report
Yang CH, Lin YS, Ou YC, Weng WC, Huang LH, Lu CH, Hsu CY, Tung MC
Thrombus straddling a patent foramen ovale and pulmonary embolism: A case report
Huang YX, Chen Y, Cao Y, Qiu YG, Zheng JY, Li TC

Therapeutic experience of an 89-year-old high-risk patient with incarcerated cholecystolithiasis: A case report and literature review

Woven coronary artery: A case report
Wei W, Zhang Q, Gao LM

Idiopathic multicentric Castleman disease with pulmonary and cutaneous lesions treated with tocilizumab: A case report
Han PY, Chi HH, Su YT

Perianorectal abscesses and fistula due to ingested jujube pit in infant: Two case reports
Liu YH, Lv ZB, Liu JB, Sheng QF

Forniceal deep brain stimulation in severe Alzheimer’s disease: A case report

Systemic autoimmune abnormalities complicated by cytomegalovirus-induced hemophagocytic lymphohistiocytosis: A case report
Miao SX, Wu ZQ, Xu HG

Nasal mucosa pyoderma vegetans associated with ulcerative colitis: A case report
Yu SX, Cheng XK, Li B, Hao JH

Amiodarone-induced hepatotoxicity — quantitative measurement of iodine density in the liver using dual-energy computed tomography: Three case reports
Lv HJ, Zhao HW

Multisystem involvement Langerhans cell histiocytosis in an adult: A case report
Wang BB, Ye JR, Li YL, Jin Y, Chen ZW, Li JM, Li YP

New mutation in EPCAM for congenital tufting enteropathy: A case report
Zhou YQ, Wu GS, Kong YM, Zhang XY, Wang CL

Catastrophic vertebral artery and subclavian artery pseudoaneurysms caused by a fishbone: A case report
Huang W, Zhang GQ, Wu JJ, Li B, Han SG, Chao M, Jin K

Anastomosing hemangioma arising from the left renal vein: A case report

Bladder perforation caused by long-term catheterization misdiagnosed as digestive tract perforation: A case report
Contents

Semimonthly Volume 8 Number 20 October 26, 2020

4999 Primary pulmonary plasmacytoma accompanied by overlap syndrome: A case report and review of the literature

5007 Gastrointestinal stromal tumor metastasis at the site of a totally implantable venous access port insertion: A rare case report
   Yin XN, Yin Y, Wang J, Shen CY, Chen X, Zhao Z, Cai ZL, Zhang B

5013 Massive gastrointestinal bleeding caused by a Dieulafoy’s lesion in a duodenal diverticulum: A case report
   He ZW, Zhong L, Xu H, Shi H, Wang YM, Liu XC

5019 Plastic bronchitis associated with Botrytis cinerea infection in a child: A case report
   Liu YR, Ai T

5025 Chest, pericardium, abdomen, and thigh penetrating injury by a steel rebar: A case report
   Yang XW, Wang WT

5030 Monocular posterior scleritis presenting as acute conjunctivitis: A case report
   Li YZ, Qin XH, Lu JM, Wang YP

5036 Choriocarcinoma with lumbar muscle metastases: A case report
   Pang L, Ma XX

5042 Primary chondrosarcoma of the liver: A case report
   Liu ZY, Jin XM, Yan GH, Jin GY

5049 Successful management of a tooth with endodontic-periodontal lesion: A case report
   Alshawwa H, Wang JF, Liu M, Sun SF

5057 Rare imaging findings of hypersensitivity pneumonitis: A case report
   Wang HJ, Chen XJ, Fan LX, Qi QL, Chen QZ

5062 Effective administration of cranial drilling therapy in the treatment of fourth degree temporal, facial and upper limb burns at high altitude: A case report
   Shen CM, Li Y, Liu Z, Qi YZ
ABOUT COVER
Peer-reviewer of World Journal of Clinical Cases, Dr. Aleem Ahmed Khan is a Distinguished Scientist and Head of The Central Laboratory for Stem Cell Research and Translational Medicine, Centre for Liver Research and Diagnostics, Deccan College of Medical Sciences, Kanchanbagh, Hyderabad (India). Dr. Aleem completed his Doctorate from Osmania University, Hyderabad in 1998 and has since performed pioneering work in the treatment of acute liver failure and decompensated cirrhosis using hepatic stem cell transplantation. During his extensive research career he supervised 10 PhD students and published > 150 research articles, 7 book chapters, and 2 patents. His ongoing research involves developing innovative technologies for organ regeneration and management of advanced cancers. (L-Editor: Filipodia)

AIMS AND SCOPE
The primary aim of World Journal of Clinical Cases (WJCC, World J Clin Cases) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

INDEXING/ABSTRACTING
The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, PubMed, and PubMed Central. The 2020 Edition of Journal Citation Reports® cites the 2019 impact factor (IF) for WJCC as 1.013; IF without journal self cites: 0.991; Ranking: 120 among 165 journals in medicine, general and internal; and Quartile category: Q3.

RESPONSIBLE EDITORS FOR THIS ISSUE
Production Editor: Ji-Hong Liu; Production Department Director: Xiang Li; Editorial Office Director: Jin-Lei Wang.

NAME OF JOURNAL
World Journal of Clinical Cases

ISSN
ISSN 2307-8960 (online)

LAUNCH DATE
April 16, 2013

FREQUENCY
Semimonthly

EDITORS-IN-CHIEF
Dennis A Bloomfield, Sandro Vento, Bao-Gan Peng

EDITORIAL BOARD MEMBERS
https://www.wjgnet.com/2307-8960/editorialboard.htm

PUBLICATION DATE
October 26, 2020

COPYRIGHT
© 2020 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS
https://www.wjgnet.com/bpg/GerInfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH
https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/GerInfo/288

PUBLICATION MISCONDUCT
https://www.wjgnet.com/bpg/GerInfo/208

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/GerInfo/242

STEPS FOR SUBMITTING MANUSCRIPTS
https://www.wjgnet.com/bpg/GerInfo/239

ONLINE SUBMISSION
https://www.f6publishing.com
Gastrointestinal stromal tumor metastasis at the site of a totally implantable venous access port insertion: A rare case report

Xiao-Nan Yin, Yuan Yin, Jiang Wang, Chao-Yong Shen, Xin Chen, Zhou Zhao, Zhao-Lun Cai, Bo Zhang

BACKGROUND
The totally implantable venous access port (TIVAP) is an important device in patients for injecting blood products, parenteral nutrition or antineoplastic chemotherapy. Metastatic spread at the site of the insertion of a TIVAP is extremely rare.

CASE SUMMARY
We report the case of 33-year-old male with advanced gastrointestinal stromal tumor (GIST) who underwent radical tumor resection after neoadjuvant imatinib therapy. However, a solitary GIST metastasis at the site of a TIVAP insertion developed during adjuvant imatinib treatment. Mutational analysis showed secondary mutation in KIT exon 13 (V564A), which is resistant to imatinib treatment. To our knowledge, this is the first case report of a patient with advanced GIST developing GIST metastasis at the site of a TIVAP insertion.

CONCLUSION
This case highlights that when a patient with advanced, high metastatic GIST requires TIVAP insertion, we should realize that there is a risk of developing tumor metastasis at the site of a TIVAP insertion.

Key Words: Tumor metastasis; Gastrointestinal stromal tumor; Totally implantable venous access port; Targeted therapy; Mutational analysis; Computed tomography; Case report

©The Author(s) 2020. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: In this article, we report a man with advanced gastrointestinal stromal tumor...
A totally implantable venous access port (TIVAP) is an important device inserted in a large vein, such as the subclavian vein, and is used to inject blood products, parenteral nutrition or antineoplastic chemotherapy that would ravage a smaller peripheral vein. The use of TIVAP is associated with a series of complications including hemorrhage, hemothorax, pneumothorax, venous thrombosis, infection, and arterial puncture or cannulation\(^1\). The occurrence of tumor metastasis at the site of the insertion of a TIVAP is extremely rare. A few studies have reported patients with head and neck, thoracic or hematological malignant tumors who developed tumor seeding at the site of central venous access\(^2\). However, tumor metastases of abdominal solid tumors at the site of the insertion have not been reported thus far. To our knowledge, we report the first case of gastrointestinal stromal tumor (GIST) with metastatic tumor at the site of a TIVAP insertion.

### INTRODUCTION

The patient was administered imatinib 400 mg orally daily on a neoadjuvant basis before surgery. After 10 mo of imatinib therapy, the tumor showed a marked reduction in size (approximately 8.6 cm \(\times\) 6.7 cm), tumor enhancement at arterial phase CT decreased substantially and hepatic metastatic lesions showed no enhancement (Figure 1C and D). Surgery was requested by the patient. At laparotomy, the tumor was located at the gastric fundus and invaded the nearby organs including the spleen, the tail of the pancreas and the left adrenal gland. The tumor was resected en bloc with the spleen, a portion of the stomach and the left adrenal gland, and the tail of the pancreas, and the hepatic metastatic tumors were also removed according to the findings of intraoperative ultrasonography, achieving an R0 resection. The pathological report of the resected specimen showed a tumor mass with diffuse hyalinization, fibrosis and focal hemorrhage and necrosis. Only a few spindle cells were distributed in the tumor lesion and the cells were positive for CD117 and DOG-1 (Figure 1D). Unfortunately, the patient developed a gastric fistula postoperatively, and a single lumen 16 G TIVAP was inserted into the right subclavian vein via the Seldinger technique, with the aim of prolonged parenteral nutrition. Furthermore, an intestinal fistula was also repaired. The patient was discharged from the hospital one month after the surgery.

### CASE PRESENTATION

**Chief complaints**

A 35-year-old man presented with a painless mass at the right side of the chest wall.

**History of present illness**

One month prior to admission, the patient presented with a raised and painless mass in the right infraclavicular fossa.

**History of past illness**

The patient was diagnosed with a gastric GIST in April 2016. A computed tomography (CT) scan showed a huge inhomogeneous soft tissue mass (approximately 18.1 cm \(\times\) 11.9 cm) with central necrosis, occupying the entire left upper abdomen, along with two nodular enhancing liver lesions (the largest lesion was approximately 2.5 cm) suspicious of a metastatic malignancy in the right lobe (Figure 1A and B). In light of the pathologic diagnosis and the CT scan, the tumor was classified as an advanced GIST. The patient was administered imatinib 400 mg orally daily on a neoadjuvant basis before surgery. After 10 mo of imatinib therapy, the tumor showed a marked reduction in size (approximately 8.6 cm \(\times\) 6.7 cm), tumor enhancement at arterial phase CT decreased substantially and hepatic metastatic lesions showed no enhancement (Figure 1C and D). Surgery was requested by the patient. At laparotomy, the tumor was located at the gastric fundus and invaded the nearby organs including the spleen, the tail of the pancreas and the left adrenal gland. The tumor was resected en bloc with the spleen, a portion of the stomach and the left adrenal gland, and the tail of the pancreas, and the hepatic metastatic tumors were also removed according to the findings of intraoperative ultrasonography, achieving an R0 resection. The pathological report of the resected specimen showed a tumor mass with diffuse hyalinization, fibrosis and focal hemorrhage and necrosis. Only a few spindle cells were distributed in the tumor lesion and the cells were positive for CD117 and DOG-1 (Figure 2). Unfortunately, the patient developed a gastric fistula postoperatively, and a single lumen 16 G TIVAP was inserted into the right subclavian vein via the Seldinger technique, with the aim of prolonged parenteral nutrition. Furthermore, an intestinal fistula was also repaired. The patient was discharged from the hospital one month after the surgery.

**Citation:** Yin XN, Yin Y, Wang J, Shen CY, Chen X, Zhao Z, Cai ZL, Zhang B. Gastrointestinal stromal tumor metastasis at the site of a totally implantable venous access port insertion: A rare case report. World J Clin Cases 2020; 8(20): 5007-5012

**URL:** https://www.wjgnet.com/2307-8960/full/v8/i20/5007.htm

**DOI:** https://dx.doi.org/10.12998/wjcc.v8.i20.5007
feeding tube was placed for enteral nutrition support. One month later, the patient was treated with total enteral nutrition and the TIVAP was removed. Two months after the operation, the gastric leak healed, oral feeding and imatinib treatment (400 mg/d) were resumed and the drains removed. The patient had no other significant past history or family history.

**Physical examination**
Physical examination revealed a raised and painless mass (approximately 6 cm × 5 cm) on the right side of the chest wall.

**Laboratory examinations**
Except for below normal average albumin level, other laboratory examinations were normal.

**Imaging examinations**
A raised mass (approximately 6 cm × 5 cm) was noted on the right side of the chest wall, which was around the site of the TIVAP insertion. A CT scan of the chest showed an inhomogeneous mass (approximately 5.7 cm × 4.6 cm) in the right infraclavicular fossa, which was supplied by the right subclavian artery and pressed the right subclavian and brachiocephalic veins (Figure 3). A magnetic resonance imaging (MRI) examination demonstrated a mixed signal mass without involvement of surrounding...
Computed tomography showed an inhomogeneous mass (approximately 5.7 cm × 4.6 cm) in the right infraclavicular fossa. No radiological or clinical evidence of abdominal relapse or metastasis were found on abdominal CT.

**FINAL DIAGNOSIS**

The final diagnosis of this infraclavicular mass was metastatic GIST.

**TREATMENT**

Histopathology from core needle biopsy of the mass confirmed a metastatic GIST (Figure 5). Subsequently, the patient underwent radical resection of the metastatic infraclavicular GIST. Mutational analysis showed secondary mutation in KIT exon 13 (V564A), which is resistant to imatinib treatment. Switching to sunitinib treatment was suggested to the patient. The patient started sunitinib (37.5 mg/d) treatment after metastasectomy.

**OUTCOME AND FOLLOW-UP**

A postoperative CT examination showed no residual disease. The patient recovered well and has not yet shown signs of recurrence after 14 mo of clinical follow-up.

**DISCUSSION**

GIST is the most common mesenchymal tumor originating from the interstitial cells of Cajal in the digestive tract. GIST can occur anywhere in the gastrointestinal tract, but is most common in the stomach (65%), small intestine (25%), colon and rectum (5%-10%) and esophagus (5%). Almost all GISTs have activating mutations of KIT or PDGFRA. Metastases are usually seen in the liver and peritoneum. Lymph node and extra-abdominal metastases are rare and sites include bone, lung, skin and soft tissue. However, tumor seeding at the site of a TIVAP implant has not been reported in the literature.

We report the case of a patient with subclavian metastasis of gastric GIST at the site of a TIVAP insertion during treatment with imatinib. After effective downsizing of an advanced gastric GIST with neoadjuvant imatinib, the patient was successfully treated with tumorectomy and continued imatinib therapy. The patient continued to do well for 23 mo until the subclavian metastatic mass at the site of the TIVAP insertion was found, and there was no radiological or clinical evidence of abdominal relapse or metastasis. In our patient, the most likely explanation for the subclavian metastatic tumor is circulating tumor cells seeding from the catheter when the subclavian vein was punctured. The trauma caused by puncture may provide an inflammatory
Figure 4  Magnetic resonance imaging showed a mixed signal mass without involvement of surrounding soft tissue and bone.

Figure 5  Histopathology revealed strong, diffuse CD117 and DOG-1 expression, which confirmed a metastatic gastrointestinal stromal tumor.

Following a review of the literature regarding tumor metastasis at the site of central venous catheter insertion; head and neck malignancy, hematological and intrathoracic malignant tumors most commonly appear to result in tumor implants at the site of TIVAP insertion and the most common histology is squamous cell carcinoma. Compared to limited stage tumors and well differentiated tumors, aggressive and advanced tumors and poor differentiated tumors are more likely associated with tumor seeding at the site of insertion[3,10-13]. Furthermore, the puncture method or technique are also correlated with tumor spread. Previous studies reported that, for TIVAP insertion, the Seldinger technique is more likely to cause tumor seeding when compared with direct cephalic vein cut down, and multiple punctures may also increase the risk of tumor spread[5].

CONCLUSION
In summary, it should be realized that there is a risk of developing tumor metastasis at the site of insertion when a patient with advanced, high metastatic GIST requires a TIVAP insertion.
REFERENCES


