International Journal of Surgery Case Reports 89 (2021) 106616

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr

Case report

Mesenteric and myocardial ischemia revealing lower limb sarcoma

Heungman Jun *

Department of Surgery, Inje University College of Medicine, Ilsan-Paik Hospital, Goyang, Republic of Korea

ARTICLE INFO

Keywords:
Mesenteric ischemia
Leiomyosarcoma
Embolism

ABSTRACT

Introduction and importance: Although most of the causes of acute superior mesenteric artery (SMA) embolism with a poor clinical course originate from the heart, we report a case of SMA embolism secondary to advanced sarcoma of the lower extremities.
Case presentation: A 66-year-old man presented with chest and epigastric discomfort that lasted for 1 day. Coronary angioplasty was performed, followed by laparotomy with an embolectomy of the SMA, small bowel resection, and ileostomy. After surgery, leiomyosarcoma was diagnosed on a biopsy performed in the left thigh, and lung metastasis was confirmed. He had recurrent peritonitis for 2 months and died of multiple organ failure.
Clinical discussion: The common etiologies of SMA embolism include cardioembolic sources with atrial fibrillation and recent myocardial infarction. Rare etiologies include atherosclerotic plaque, mural thrombus of the aneurysm, and cardiac sarcoma.
Conclusion: Efforts are required for the systemic evaluation of various etiologies in patients with SMA embolism who require rapid diagnosis and intervention.

1. Introduction

Acute mesenteric ischemia, including superior mesenteric artery (SMA) embolism, has a high mortality rate because it induces bowel necrosis and systemic inflammatory processes [1]. Based on etiology, acute mesenteric ischemia is divided into mesenteric artery embolism, artery thrombosis, venous thrombosis, and non-occlusive mesenteric ischemia. In particular, because SMA embolism progresses very quickly, prompt diagnosis and intervention are important for the patient's prognosis [2]. Due to the patient's rapidly deteriorating clinical course, surgeons naturally consider only the heart as the main cause of embolism and focus on treatment. Here, we report a case of acute SMA embolism and myocardial ischemia secondary to advanced sarcoma of the lower extremities with lung metastasis for the first time. The object of this study is the importance of systemic evaluation in SMA embolism. This case has been reported in line with SCARE criteria [3].

2. Presentation of case

A 66-year-old man presented to the emergency department with chest and epigastric discomfort that lasted for 1 day. The patient had no medical, family, and psychosocial history. The symptoms in the chest and epigastrium did not worsen at rest and were slightly uncomfortable. At admission, vital signs were stable, and laboratory tests revealed an elevated white blood cell count of 28.40 $\times$ 10^3/mm^3, C-reactive protein level of 23 mg/dL, and serum creatinine level of 1.56 mg/dL. Mild ST elevation was noted on electrocardiogram, and plain old balloon angioplasty was performed in the left circumflex artery and right coronary artery. After coronary angioplasty, the abdominal pain worsened with tenderness of the whole abdomen. SMA embolism in the long segment, decreased enhancement in the jejunum and ileum of the long range, and partial splenic infarction were revealed on abdominal computed tomography (CT) (Fig. 1).

Emergent laparotomy, consisting of embolectomy of the SMA, jejuno-ileal resection of 120 cm, and ileostomy, was performed by skilled vascular and colorectal surgeons. The long segment of the jejunum and ileum showed ischemia, and the color of the remnant small bowel did not appear to be good. Embolectomy with a Fogarty catheter was performed by mobilizing the proximal SMA on the mesentery side, and bovine patch angioplasty was also conducted due to severe luminal narrowing (Fig. 2). Biopsy of the thrombus obtained during the surgery showed no malignancy. Ileostomy was performed to check the mucosa of the remnant unhealthy small bowel and to prevent anastomotic leakage.

After surgery, while the patient is recovering with diet, it was found that there was a large mass on the left thigh of the patient 6 months

* Department of Surgery, Inje University College of Medicine, Ilsan Paik Hospital, Joowha-ro 170, Ilsanseo-gu, Goyang, Gyunggi, 10380, Republic of Korea.
E-mail address: junh@paik.ac.kr.

https://doi.org/10.1016/j.ijscr.2021.106616
Received 25 September 2021; Received in revised form 19 October 2021; Accepted 16 November 2021
Available online 25 November 2021

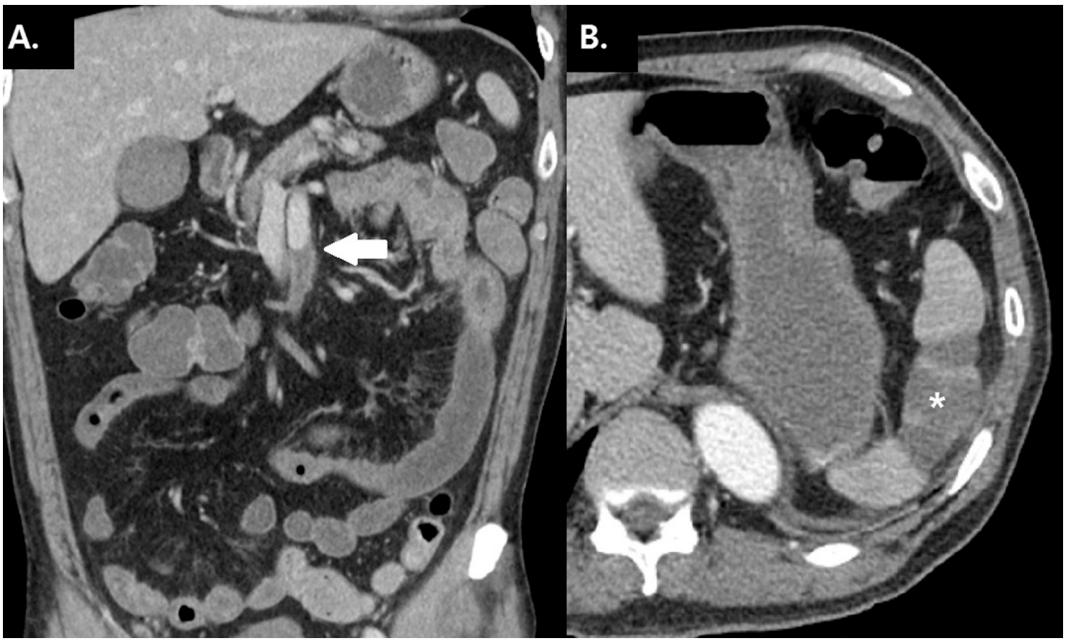

Fig. 1. Preoperative abdominal computed tomography findings. Superior mesenteric artery embolism (white arrow) was prominently identified in the coronal plane (A). Partial splenic infarction (white asterisk) was revealed in the axial plane (B).

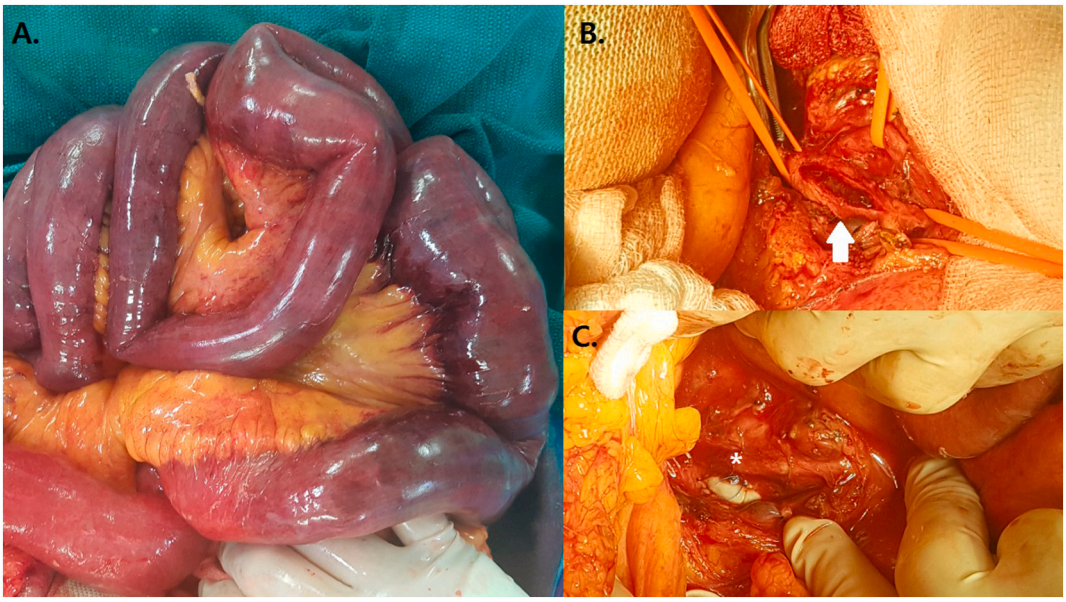

Fig. 2. Operative findings. The long segment of the jejunum and ileum showed ischemia (A). Superior mesenteric artery with severe luminal narrowing (white arrow) was identified (B). After Fogarty embolectomy, bovine patch angioplasty (white asterisk) was performed (C).

prior. Magnetic resonance imaging revealed multiple tumors close to the malignancy near the vastus medialis muscle. He was diagnosed with leiomyosarcoma (LMS) using an ultrasound-guided needle biopsy. Chest CT showed embolism of the descending aorta and multiple metastatic lung nodules (Fig. 3). He had recurrent peritonitis with remnant bowel ischemia for 2 months and died of multiple organ failure.

3. Discussion

Acute SMA embolism is responsible for approximately 50% of the causes of acute mesenteric ischemia [4]. Although the overall incidence is low, it is clinically important because prompt diagnosis and intervention can lower the mortality [2]. The common etiologies of SMA embolism include cardioembolic sources with atrial fibrillation, recent myocardial infarction, congestive heart failure, and endocarditis [5]. In the literature, rare etiologies include detached atherosclerotic plaque, mural thrombus of the aneurysm [6], cardiac sarcoma [7], and essential thrombocythemia [8]. Although there have been reports of direct mesenteric embolization by cardiac sarcoma [9], this is the first report of a patient with lower extremity sarcoma with lung metastasis.

LMS mainly derived from smooth muscle cells accounts for approximately 25% of soft tissue sarcomas, and mainly occurs in the uterus, but rarely in the abdomen, retroperitoneum, blood vessels, and extremities [10]. LMS in the uterus produces metastasis through hematogenous spreads, usually to the lung, liver, and peritoneal cavity [11]. In the extremities, LMS accounts for 10%–15% of all LMS and occurs mainly in

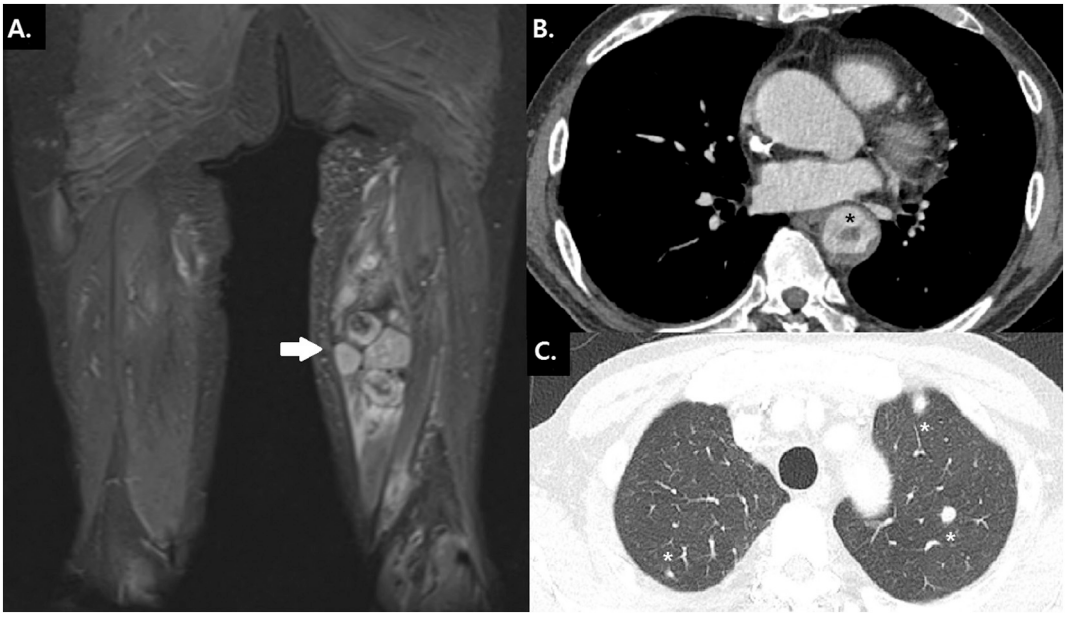

Fig. 3. Postoperative magnetic resonance imaging of thigh and chest computed tomography findings. Multiple tumors (white arrow) near the vastus medialis muscle were prominently identified (A). Chest CT showed embolism (black asterisk) of the descending aorta (B) and multiple metastatic lung nodules (white asterisk) (C).

the thigh and predominately in the older population [12]. There are few reports of distant metastasis of LMS in the extremities. As for the distal embolization of sarcoma, there are reports of sarcoma of the aorta [13], vena cava [14], and heart [15], causing pulmonary embolism at close range. More distantly, there have been reports of pulmonary embolism from renal sarcoma [16] and upper limb arterial embolization from aortic arch sarcoma [17].

In this case, there is a limitation in that it is ambiguous whether the cause of embolism is heart or sarcoma. Since abdominal pain was present from the beginning and chest discomfort was accompanied by only mild coronary stenosis without arrhythmia, the author considered the possibility of advanced sarcoma as the cause.

4. Conclusion

This case highlights the need for systemic evaluation of various etiologies when evaluating patients with SMA embolism who require rapid diagnosis and intervention. We report a case of acute SMA embolism and myocardial ischemia in a patient with advanced sarcoma of the lower extremities with lung metastasis.

Consent

Consent was obtained from the guardian (patient's son) for publication of this case report and accompanying image. A copy of the written consent is available for review by the Editor-in-Chief on request.

Provenance and peer review

Not commissioned, external peer-reviewed.

Ethical approval

The Institutional Review Board approved the review of patient records.

The number from IRB is 2021-05-027.

Funding

None.

Guarantor

Dr. Heungman Jun accepts full responsibility for the work and/or the conduct of the study, has access to the data, and controls the decision to publish.

Research registration number

researchregistry7179.

CRediT authorship contribution statement

Heungman Jun (HJ) = Study concept, Data collection, Surgical therapy, Writing – original draft preparation, Editing and writing.

Declaration of competing interest

None.

Acknowledgement

None.

References

[1] R.J. Stoney, C.G. Cunningham, Acute mesenteric ischemia, Surgery 114 (1993) 489–490, https://doi.org/10.1053/j.tvir.2014.12.004.
[2] I.G. Schoots, G.I. Koffeman, D.A. Legemate, M. Levi, T.M. van Gulik, Systematic review of survival after acute mesenteric ischaemia according to disease aetiology, Br. J. Surg. 91 (2004) 17–27, https://doi.org/10.1002/bjs.4459.
[3] SCARE Group, R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230, https://doi.org/10.1016/j.ijsu.2020.10.034.
[4] D.G. Clair, J.M. Beach, Mesenteric ischemia, N. Engl. J. Med. 374 (2016) 959–968, https://doi.org/10.1056/NEJMra1503884.
[5] T.G. Walker, Mesenteric vasculature and collateral pathways, Semin. Intervent. Radiol. 26 (2009) 167–174, https://doi.org/10.1055/s-0029-1225663.
[6] M.C. Wyers, Acute mesenteric ischemia: diagnostic approach and surgical treatment, Semin. Vasc. Surg. 23 (2010) 9–20, https://doi.org/10.1053/j.semvascsurg.2009.12.002.
[7] A. Robinson, T. Woodman, B. Ozdemir, A. Phaily, Embolic superior mesenteric artery (SMA) occlusion secondary to a cardiac sarcoma, B.M.J. Case Rep. (2016), https://doi.org/10.1136/bcr-2016-214575.

[8] S.M. Jung, H. Jun, Recurrent thrombosis of splanchnic and lower extremity arteries with essential thrombocythemia, S.A.G.EOpen Med. Case Rep. 7 (2019), https://doi.org/10.1177/2050313X19880079, 2050313X19880079.
[9] M.J. Clores, F. Monzur, R. Rajapakse, Acute mesenteric ischemia caused by rare cardiac tumor embolus, A.C.G. Case Rep. J. 2 (2014) 27–29, https://doi.org/10.14309/crj.2014.74.
[10] C.A. Stiller, A. Trama, D. Serraino, et al., Descriptive epidemiology of sarcomas in Europe: report from the RARECARE project, Eur. J. Cancer 49 (2013) 684–695, https://doi.org/10.1016/j.ejca.2012.09.011.
[11] S. Yamada, S.M. Yamada, H. Nakaguchi, M. Murakami, K. Hoya, A. Matsuno, A case of multiple brain metastases of uterine leiomyosarcoma with a literature review, Surg. Oncol. 20 (2011) e127–e131, https://doi.org/10.1016/j.suronc.2011.04.001.
[12] S. George, C. Serrano, M.L. Hensley, I. Ray-Coquard, Soft tissue and uterine leiomyosarcoma, J. Clin. Oncol. 36 (2018) 144–150, https://doi.org/10.1200/JCO.2017.75.9845.
[13] G.A. Conte, M. Alidoost, M.S. Devita, et al., Diagnostic enigma: spindle cell sarcoma of the aorta presenting as pulmonary embolism and chronic anaemia, Eur. J. Case Rep. Intern. Med. 7 (2020), 001832, https://doi.org/10.12890/2020_001832.
[14] B.L. Rosenfeld, R. Bashir, M.A. Brisco-Bacik, et al., Leiomyosarcoma tumor embolism masquerading as thrombus in transit, Am. J. Case Rep. 21 (2020), e921124, https://doi.org/10.12659/AJCR.921124.
[15] K. Cagli, E. Gunertem, I. Erkengel, K. Cagli, Right atrial mass with a pulmonary embolism, J. Card. Surg. 31 (2016) 592–593, https://doi.org/10.1111/jocs.12803.
[16] J.H. Yang, D.H. Song, C. Lee, et al., Malignant pulmonary embolism associated with renal sarcoma: a case report, Med. (Baltim.) 99 (2020), e19943, https://doi.org/10.1097/MD.0000000000019943.
[17] Y. Iida, A. Yoshitake, H. Shimizu, A case of upper limb arterial embolization from aortic arch intimal sarcoma, Ann. Vasc. Dis. 11 (2018) 358–360, https://doi.org/10.3400/avd.cr.18-00038.