A Rare Case of Splenic Artery Thrombosis Provoked By Medroxyprogesterone Acetate (DMPA) Requiring Splenectomy

Raghav Bassi, Asad A. Haider, Pranav Prakash, Abdullahi Hussein, Hamza Alzghoul, Muhammad Bilal, Anuoluwa Oyetoran, Uma G Iyer

UCF College of Medicine
UNIVERSITY OF CENTRAL FLORIDA

HCA Florida North Florida Hospital

Introduction

- Splenic artery thrombosis (SAT) occurs when the splenic artery or one of its branches becomes occluded with a thrombus and is a rare phenomenon with an estimated incidence of only 0.016% of hospital admissions.
- Common causes of SAT include cardiogenic emboli, hypercoagulable states, infection, and medication side effects.
- Hormonal contraception are known to have hypercoagulable side effects, but SAT is a very rare manifestation of this class of medications with only a few cases reported in literature.
- To our knowledge, this is the first reported case of a SAT induced by DMPA resulting in a functional autospleenectomy.

Case Presentation

- A 48-year-old female with a past medical history significant for hypertension, presented with sudden severe left lower quadrant abdominal pain, nausea, and non-bloody vomiting.
- Physical exam was remarkable for exquisite tenderness to palpation of the left lower quadrant. Significant lab abnormalities included a white blood cell count of 11.2 thousand/mm^3 (normal range 4.5-10.5 thousand/mm^3), a D-dimer of 700 ng/mL fibrinogen equivalent units (normal range 0-529 ng/mL).
- A computed tomography angiography (CTA) scan of the abdomen revealed an extensive thrombus in the splenic artery, with no signs of any malignancy [Fig. 1].
- The patient was immediately started on a continuous infusion of intravenous heparin. Vascular surgery recommended she be discharged on apixaban for 6 months with no acute surgical intervention.
- The patient was then readmitted 3 months later with complaints of intense left lower quadrant abdominal pain similar to the pain on her previous admission.
- Unfortunately, the patient reported inconsistency in taking her prescribed apixaban due to lapses in insurance coverage. In addition, the patient recalled that she was receiving injectable DMPA every 3 months.
- She had received a dose 3 weeks prior to her initial admission and received another dose 3 weeks prior to her second admission. A CT scan of the abdomen revealed that the previous thrombus had increased in size to fill the entire splenic artery, as well as a low-density splenic lesion anteriorly and inferiorly [Fig. 2].
- The patient underwent robotic splenectomy with no complications. Part of the thrombosed splenic artery was ligated and the specimen was sent for biopsy, which showed a thrombus in the splenic vessels [Fig. 3].
- The patient's abdominal pain improved over the next few days and she was discharged on lifelong oral anticoagulation.

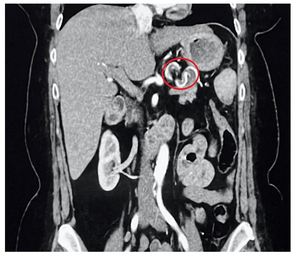

Fig 1. CTA scan of the abdomen showing an extensive filling defect in the splenic artery indicating a thrombus. Area within the red circle indicates the location of the thrombus.

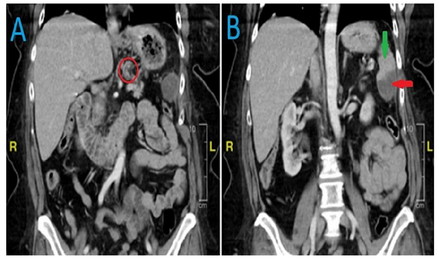

Fig 2. CT scan of the abdomen showing a filling defect indicating persistent thrombus in the splenic artery, as well as visible infarction in the spleen. (A) Area within the red circle indicates the location of the thrombus. (B) Green arrow indicates normal area of the spleen, which is hyperdense. Red arrow indicates the infarcted area of the spleen, which is hypodense.

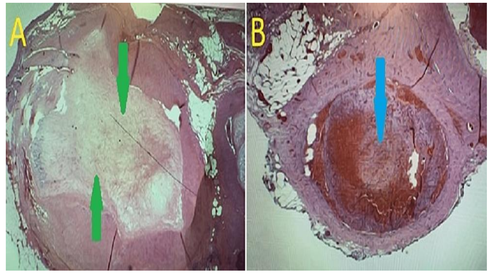

Fig 3: Histology of the splenic vessels, showing thrombosis. (A) Completely thrombosed vessel, with green arrows indicating area of organized fibrosis. (B) Partially occluded vessel, with blue arrow indicating partially organizing thrombi

Discussion

- The most common causes of SAT were ruled out in our patient as she denied any personal or family history of blood clots, sickle cell disease, valvular heart disease, atrial fibrillation or other arrhythmias, patent foramen ovale, malignancies, and her outpatient hypercoagulable workup was negative.
- Given the temporal relationship of her SAT in the setting of DMPA on both admissions, DMPA was determined to be the causative agent.
- Although progestin-only contraceptives (POCs) such as DMPA, are thought to have a lower risk of thrombotic events than combined estrogen-progestin contraceptives, the precise magnitude of increased risk of thrombotic events with POCs is a subject of debate.
- There are case reports that have described an association between arterial thrombosis and DMPA due to increase thrombin formation, reduced smooth muscle content and remodeling of the non-collagenous plaque matrix.
- There is no consensus criteria regarding the diagnostic approach to SAT. In our patient, SAT was diagnosed with computed tomography, which is one of the most common methods used in practice
- The treatment of SAT typically consists of therapeutic anticoagulation and supportive care. Most patients will recover with anticoagulation alone and not require procedural intervention.
- The duration of anticoagulation is typically 3-6 months if provoked, and indefinite if cryptogenic. Surgical treatment is necessary in cases where symptoms persist, the clot grows significantly in size despite anticoagulation, or when complications are present (e.g. abscess, pseudocyst, autosplenectomy)

Conclusion

- We present a case of extensive SAT that was induced and exacerbated by DMPA while excluding other possible exacerbating factors.
- To our knowledge, SAT attributable to DMPA was not previously reported in literature.
- Future studies should be done to further establish the relationship between hormonal contraception and the different clinical manifestations of arterial thrombosis

References

1.Schattner A, Adi M, Kitroser E, Klepfish A: Acute Splenic Infarction at an Academic General Hospital Over 10 Years: Presentation, Etiology, and Outcome. 2016, 2431:1363. 10.1097/MD.0000000000001363
2.Wand O, Tayer-Shifman OE, Khoury S, Hershko AY: A practical approach to infarction of the spleen as a rare manifestation of multiple common diseases. Ann Med. 2018, 50:494-500. 10.1080/07853890.2018.1492148
3.Antopolsky M, Hiller N, Salameh S, Goldshtein B, Stalnikowicz R: Splenic infarction: 10 years of experience. Am J Emerg Med. 2009, 27:262-265. 10.1016/j.ajem.2008.02.014

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

HCA Healthcare®