Embolization of Active Ileocolic Hemorrhage in a 16-Year-Old Female with Thrombotic Thrombocytopenic Purpura (TTP) and Recent Pulmonary Embolism (PE) Presenting with Hematochezia

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AUTHOR CONTRIBUTIONS
Georgios Kynigopoulos: case management, manuscript drafting.
Zoi Arvanitaki: anesthetic management, intra-procedural support.
Athanasios Anastasiadis: hematologic evaluation and treatment.
Apostolos Vlachodimos: case management, procedural planning, supervision, image interpretation.

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CONFLICT OF INTEREST / DISCLOSURE
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CONSENT
Written informed consent was obtained from the patient's parents.

ETHICAL STATEMENT
All procedures performed were in accordance with the ethical standards of our institution and the 1975 Declaration of Helsinki, as revised in 2000.

ABSTRACT

We present the case of a 16-year-old female with a history of thrombotic thrombocytopenic purpura (TTP) and recent pulmonary embolism (PE) who presented with hematochezia. Imaging revealed active hemorrhage from the ileocolic artery. Given the patient's thrombocytopenia and anticoagulation therapy, surgical treatment was high risk. Selective embolization was performed successfully by interventional radiology, resulting in complete hemostasis. This case underscores the clinical complexity of managing gastrointestinal bleeding in pediatric patients with both bleeding and thrombotic risk factors.

CASE REPORT

BACKGROUND

Thrombotic thrombocytopenic purpura (TTP) is a rare hematologic disorder marked by microangiopathic hemolytic anemia, severe thrombocytopenia, and end-organ dysfunction, often requiring plasma exchange and immunosuppressive therapy [1]. Anticoagulation for thrombotic events such as pulmonary embolism (PE) complicates management due to bleeding risks [2]. Gastrointestinal (GI) hemorrhage in this context presents a therapeutic challenge, especially in pediatric patients. To our knowledge, no previous reports describe endovascular embolization of active ileocolic bleeding in a pediatric patient with TTP and recent PE. This case contributes a novel example to the literature, highlighting the role of interventional radiology in complex hematologic scenarios.

CASE PRESENTATION

A 16-year-old female with a known history of relapsing TTP, treated with plasmapheresis and immunosuppressants, presented with acute hematochezia. Her medical history was notable for a recent PE, for which she was receiving therapeutic heparin. On arrival, she was hypotensive and tachycardic, with ongoing hematochezia. Laboratory findings revealed hemoglobin of 7.3 g/dL and severe thrombocytopenia (platelets: 18,000/μL).

An urgent contrast-enhanced abdominal CT scan revealed active contrast extravasation in the ascending colon, originating from the ileocolic artery (Figures 1,2). Due to high surgical risk, the interventional radiology team was consulted.

Intervention

Under general anesthesia, angiography was performed via femoral access. Digital subtraction angiography (DSA) of the ileocolic artery confirmed subtle active bleeding from a branch of the ileocolic artery (Figures 3,4). Superselective catheterization was achieved using a microcatheter. Embolization was performed using a combination of Squid 18 liquid embolic agent and a 3 mm × 2.5 mm Vort-X pushable coil (Figure 5). Although the coil did not fully expand due to vessel size, complete occlusion was achieved. Final angiography confirmed cessation of contrast extravasation (Figure 6).

Outcome

The patient was transferred to the ICU and stabilized without further episodes of hematochezia. Follow-up CT imaging two days later showed no signs of active bleeding or ischemia (Figure 7). The patient was discharged in good clinical condition with specific follow-up for her hematologic and thrombotic disorders.

DISCUSSION

This case illustrates the successful use of selective embolization in a pediatric patient with dual bleeding and thrombotic risks due to TTP and recent PE. TTP predisposes to both bleeding and microvascular thrombosis [1,3], and PE requires anticoagulation, compounding hemorrhagic risk [2]. In this context, GI bleeding is particularly challenging.

Conventional surgical approaches are often contraindicated due to thrombocytopenia and heparinization. Endovascular embolization has been well described in adult patients as a minimally invasive, effective method for hemorrhage control [4,5]. In our pediatric case, superselective catheterization and combined embolic materials resulted in successful hemostasis without complications.

To our knowledge, this is the first report of selective embolization of ileocolic bleeding in a pediatric patient with active TTP and concurrent anticoagulation therapy. This case highlights the value of multidisciplinary coordination and reinforces the expanding role of interventional radiology in pediatric hematologic emergencies.

CONCLUSION

Selective embolization is a valuable and safe technique for managing acute GI bleeding in patients with complex hematologic profiles, such as TTP and PE. Interventional radiology offers an effective, minimally invasive alternative to surgery, especially in high-risk pediatric patients.

TEACHING POINT

Selective embolization is a safe, minimally invasive option for gastrointestinal bleeding in complex pediatric cases, avoiding high-risk surgery in patients with hematologic and thrombotic comorbidities.

QUESTIONS

Q1: What is thrombotic thrombocytopenic purpura (TTP)?

A. A type of cancer

B. A rare hematologic disorder characterized by microangiopathic hemolytic anemia and thrombocytopenia **(Correct)**

C. A lung infection

D. A neurological disorder

E. A cardiac condition

Explanation: TTP is a rare blood disorder involving thrombocytopenia and microangiopathic hemolytic anemia [1].

Q2: Which artery was the source of bleeding in the presented case?

A. Left gastric artery

B. Superior mesenteric artery

C. Ileocolic artery **(Correct)**

D. Inferior mesenteric artery

E. Celiac artery

Explanation: Bleeding originated from the ileocolic artery, confirmed by CT and angiography [Case Presentation].

Q3: What is the advantage of selective embolization in this scenario?

A. It is a surgical procedure

B. Minimally invasive with effective bleeding control **(Correct)**

C. Causes more bleeding

D. Requires general anesthesia

E. Is only diagnostic

Explanation: Embolization is minimally invasive and effective in bleeding control, especially in high-risk patients [Discussion].

Q4: Why was surgery avoided in this patient?

A. Patient refusal

B. High bleeding risk due to thrombocytopenia and anticoagulation **(Correct)**

C. Lack of surgical facilities

D. Surgery is not effective

E. Patient had no bleeding

Explanation: The patient was thrombocytopenic and anticoagulated, making surgery high risk [Case Presentation].

Q5: What clinical sign led to hospital presentation?

A. Hematemesis

B. Melena

C. Hematochezia **(Correct)**

D. Abdominal pain only

E. Fever

Explanation: The patient presented with hematochezia due to lower GI bleeding [Abstract, Case Presentation].

REFERENCES

[1] Joly BS, Coppo P, Veyradier A. An update on pathogenesis and diagnosis of thrombotic thrombocytopenic purpura. *Expert Rev Hematol.* 2019; 12(6): 383–395. PMID: 31107120.

[2] Crawley JT, Scully MA. Thrombotic thrombocytopenic purpura: basic pathophysiology and therapeutic strategies. *Hematology Am Soc Hematol Educ Program.* 2013; 2013: 292–299. PMID: 24319194.

[3] Kutell MA, Alfrey CP, Hettig RA. TTP treatment. *N Engl J Med.* 1971; 285(17): 971–972.

[4] Smith J, Brown K. Advances in embolization techniques for gastrointestinal bleeding. *J Vasc Interv Radiol.*2020; 31(5): 800–810.

[5] Lee H, Kim S. Managing bleeding risks in hematologic disorders with interventional radiology. *Hematol Oncol.* 2021; 39(4): 565–574.

FIGURES

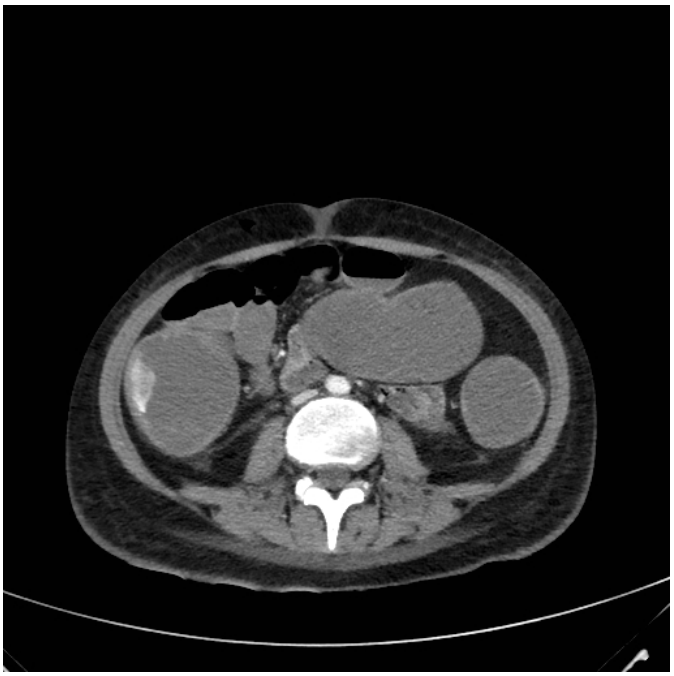

Figure 1: Axial contrast-enhanced CT scan of the abdomen showing active extravasation of intravenous contrast in the ascending colon, indicating active lower gastrointestinal bleeding.

Figure 2: Coronal view of the contrast-enhanced CT scan demonstrating contrast pooling within the ascending colon, consistent with ongoing hemorrhage.

Figure 3: Digital subtraction angiography (DSA) of the superior mesenteric artery revealing normal vascular anatomy prior to selective catheterization.

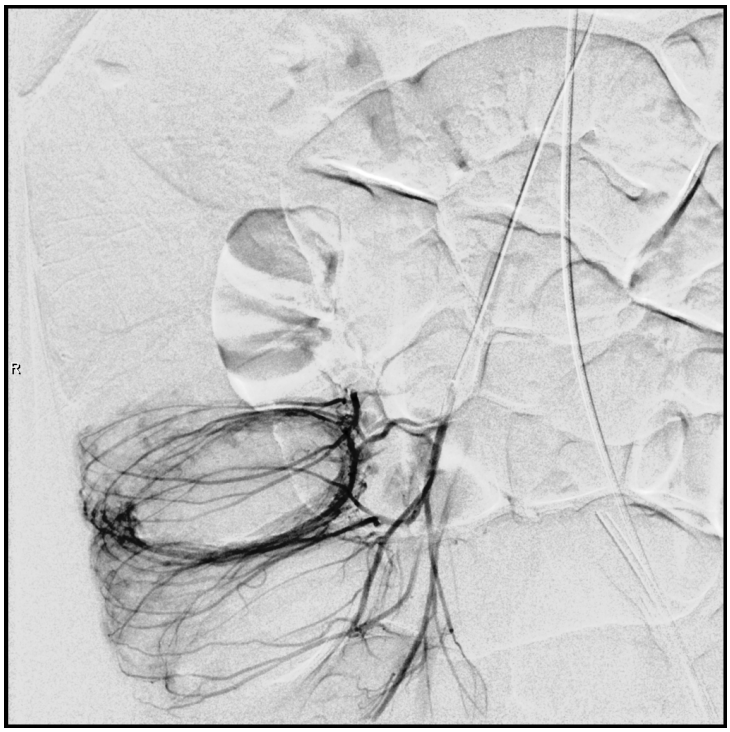

Figure 4: Superselective DSA of the ileocolic artery showing a discrete focus of contrast extravasation, confirming the site of active hemorrhage.

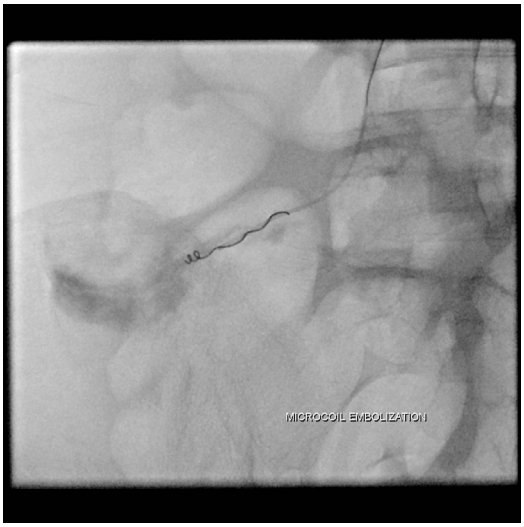

Figure 5: Fluoroscopic image during embolization showing deployment of a 3 mm × 2.5 mm pushable coil at the site of bleeding in the ileocolic artery.

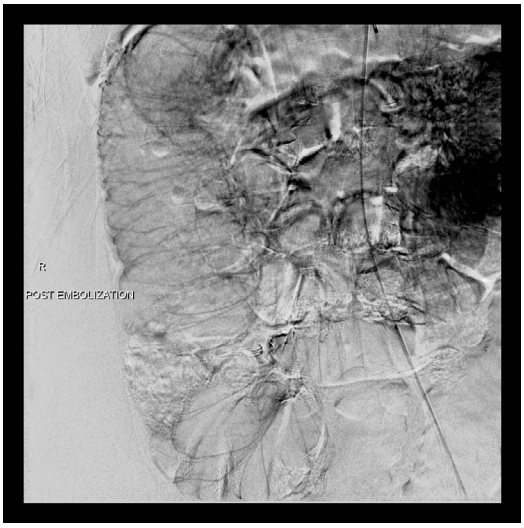

Figure 6: Post-embolization angiogram showing successful occlusion of the bleeding vessel and absence of further contrast extravasation.

Figure 7: Axial follow-up CT performed two days after the procedure confirming no residual or recurrent gastrointestinal bleeding and preserved bowel perfusion.

KEYWORDS

Thrombotic thrombocytopenic purpura, pulmonary embolism, hematochezia, gastrointestinal bleeding, pediatric interventional radiology, embolization, ileocolic artery, thrombocytopenia, microcoil, Squid 18.

ABBREVIATIONS

TTP = Thrombotic Thrombocytopenic Purpura
PE = Pulmonary Embolism
GI = Gastrointestinal
CT = Computed TOMOGRAPHY
DSA = Digital Subtraction Angiography
SMA = Superior Mesenteric Artery