CASE REPORT
DOI: 10.17944/interdiscip.1604033
Interdiscip Med J 2025;16(54):60-62

Treatment of hemorrhagic right gastro-omental artery pseudoaneurysm via ultrasound-guided percutaneous thrombin injection

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Abstract

Visceral artery pseudoaneurysms are life-threatening conditions due to their high risk of rupture and hemorrhage. Traditional treatments include endovascular interventions such as stent grafting and embolization, or open surgery. However, ultrasound-guided percutaneous thrombin injection is rarely used as a first-line therapy. This case report presents a 66-year-old patient with an iatrogenic hemorrhagic pseudoaneurysm of the right gastro-omental artery, successfully treated with ultrasound-guided percutaneous thrombin injection. Under local anesthesia, a 5 mL bolus of thrombin was injected into the pseudoaneurysm sac, resulting in immediate thrombosis confirmed by ultrasound and Doppler imaging. The patient demonstrated stable hemodynamics and hemoglobin levels post-procedure. Follow-up imaging showed significant regression of hemorrhagic fluid and no contrast extravasation. This case highlights ultrasound-guided thrombin injection as a safe, cost-effective, and radiation-free alternative to traditional treatments for selected visceral artery pseudoaneurysms, particularly in distal branches or emergency settings.
Keywords: Visceral artery, pseudoaneurysm, ultrasonography, minimally invasive procedures

INTRODUCTION

Visceral artery pseudoaneurysms are associated with a high risk of rupture and hemorrhage, necessitating timely and effective management (1). Standard treatment options, including endovascular techniques such as stent grafting or embolization, and open surgical repair, are well-established but present certain limitations. These include exposure to ionizing radiation, relatively high costs, and potential complications, particularly in high-risk or hemodynamically unstable patients (2). Moreover, these approaches may be less suitable for small pseudoaneurysms, or lesions located in distal arterial branches due to technical challenges. Ultrasound-guided percutaneous thrombin injection, in contrast, offers a minimally invasive, cost-effective, and radiation-free alternative that addresses some of these limitations. Despite its potential benefits, this technique is rarely employed as a first-line treatment in clinical practice. This report presents the case of a 66-year-old patient with an iatrogenic hemorrhagic pseudoaneurysm of the right gastro-omental artery, successfully treated with ultrasound-guided percutaneous thrombin injection. The implications of this technique are discussed in the context of the presented case and existing literature.

CASE

A 66-year-old patient underwent cholecystectomy and surgical drainage for an intraperitoneal abscess. Postoperatively, the patient experienced a significant drop in hemoglobin levels. Contrast-enhanced CT revealed contrast extravasation from the distal gastroduodenal branch, extending to the right gastro-omental artery, with associated hemorrhagic fluid accumulation around the stomach. Ultrasound examination identified a pseudoaneurysm measuring 10.5 × 11.5 mm in the subxiphoid region. Given the pseudoaneurysm's accessibility, ultrasound-guided

Cite this article: Soydan IB, Kayali A. Treatment of hemorrhagic right gastro-omental artery pseudoaneurysm via ultrasound-guided percutaneous thrombin injection. Interdiscip Med J 2025;16(54):60-62. https://doi.org/10.17944/interdiscip.1604033

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Received: Dec 19, 2024
Accepted: Jan 11, 2025

percutaneous thrombin injection was selected as the treatment modality.

Under ultrasound guidance and local anesthesia, a 5F amniocentesis needle (5 French gauge needle) was percutaneously advanced into the aneurysm sac (Figure 1). A single 5 mL bolus of thrombin (1,000 U/mL) was injected. Real-time ultrasound and Doppler imaging confirmed successful thrombosis of the pseudoaneurysm (Figure 2). The procedure was well-tolerated, with no complications. Post-procedure, the patient demonstrated stabilized hemodynamics and hemoglobin levels.

A CT angiogram performed on the third postoperative day showed no progression of hemorrhagic fluid and no contrast extravasation (Figure 3). Follow-up imaging on the 14th day revealed significant regression of the hemorrhagic fluid and no evidence of pseudoaneurysm recurrence.

DISCUSSION

Ultrasound-guided percutaneous thrombin injection is a minimally invasive, safe, and effective technique for managing visceral artery pseudoaneurysms. It provides a radiation-free and cost-effective alternative to endovascular methods, particularly for small aneurysms or distal arterial branches. Previous studies have reported the successful use of thrombin injection in pseudoaneurysms of the pancreaticoduodenal artery, splenic artery, renal-intrarenal artery, superior mesenteric artery, and uterine arteries (3-8). For instance, Barbiero et al. reported successful treatment of a pancreaticoduodenal artery pseudoaneurysm using this technique (3). Similarly, Krueger et al. highlighted its effectiveness in managing a splenic artery pseudoaneurysm (4). Benjaminov and Atri demonstrated successful thrombin injection in an intrarenal pseudoaneurysm (5), while Ros et al. described its utility in uterine artery pseudoaneurysms (8).

A study involving 19 visceral artery pseudoaneurysms highlighted higher success rates for thrombin injection in pseudoaneurysms smaller than 23 mm, particularly those located in distal branches (9). This case highlights the effectiveness of percutaneous thrombin injection as a viable alternative, especially for selected patients in emergency settings or when conventional methods are unsuitable.

CONCLUSION

Ultrasound-guided percutaneous thrombin injection offers a safe, effective, and minimally invasive option for treating visceral artery pseudoaneurysms. This method is particularly beneficial for patients with pseudoaneurysms in distal branches or in cases where endovascular treatments are contraindicated. Further studies are needed to establish standardized protocols and assess long-term outcomes.

Figure 1. (a) Intra-procedural B-mode ultrasound images: pseudoaneurysm sac prior to thrombin injection (white arrow), (b) advancement of the needle (black arrow) into the pseudoaneurysm sac, and (c) echogenic primary thrombus formation (black arrow) within the pseudoaneurysm sac following the thrombin injection

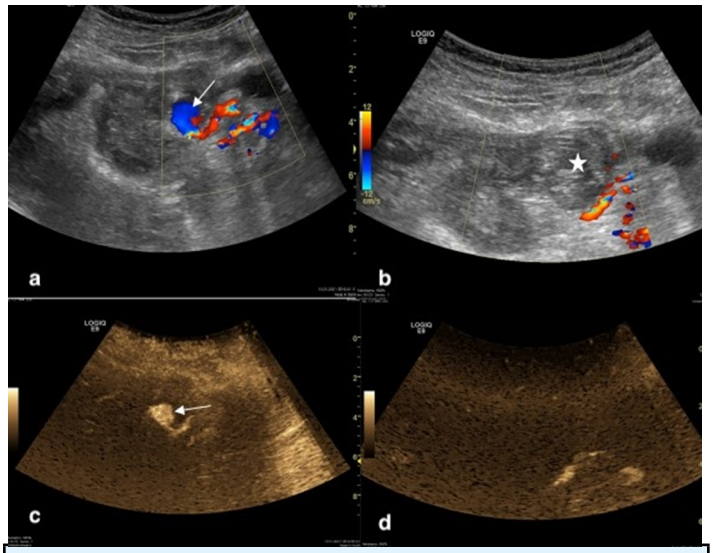

Figure 2. (a) Pre-procedural doppler ultrasound imaging demonstrates vascular flow within the pseudoaneurysm sac (white arrow). (b) Post-procedural doppler ultrasound imaging reveals the absence of vascular flow within the pseudoaneurysm sac (white star). (c) Pre-procedural B-flow imaging clearly depicts the pseudoaneurysm neck and sac (white arrow). (d) Post-procedural B-flow imaging confirms the absence of blood flow into the pseudoaneurysm sac

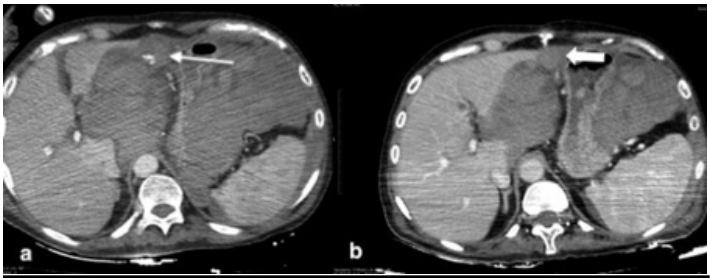

Figure 3. Computed tomography (CT) images before and after the procedure: (a) Pre-procedural CT showing the pseudoaneurysm sac with active extravasation (indicated by the arrow). (b) Post-procedural CT demonstrating the successful cessation of extravasation into the pseudoaneurysm sac (white arrow)

ACKNOWLEDGEMENTS

Peer-Review: Both externally and internally peer reviewed.

Conflict of Interest: The authors declare that they have no conflict of interests regarding content of this article.

Financial Support: The Authors report no financial support regarding content of this article.

Ethical Declaration: Informed consent was obtained from the participant and Helsinki Declaration rules were followed to conduct this study.

Athorship Contributions: Concept: IS, AK, Design: IS, AK, Supervising: AK, Data collection and entry: IS, AK, Analysis and interpretation: IS, AK, Literature search: IS, Writing: IS, Critical review: IS, AK

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