Case Report *Open Access*

Journal of Innovative Clinical Trials and Case Reports

ISSN: 3068 - 1936

DOI: *doi.org/10.63721/26JCTC0128*

Endovascular Management of Endoleak and Active Bleeding Following T-Branch Repair for Thoracoabdominal Aortic Aneurysm: A Case Report

Kai-Jie Chang[1], Chan-I Su[1], Yen-Hui Wu[2], Han-Mei Chang[3] and Ching-Ting Chang[4*]

[1]Department of Medical Imaging, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung 807, Taiwan

[2]Department of Nursing and Cardiovascular Care Unit, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung 807, Taiwan

[3]Department of Radiation Oncology, Medical Imaging, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung 807, Taiwan

[4]Department of Medical Imaging, Kaohsiung Medical University Gangshan Hospital, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung 820, Taiwan

Citation: Kai-Jie Chang, Chan-I Su, Yen-Hui Wu, Han-Mei Chang, Ching-Ting Chang (2026) Endovascular Management of Endoleak and Active Bleeding Following T-Branch Repair for Thoracoabdominal Aortic Aneurysm: A Case Report. J. of Inn Clin Trail Case Reports 2(1), 1-4. WMJ/JCTC-128

Abstract

Thoracoabdominal aortic aneurysm (TAAA) is a complex vascular condition traditionally managed with open surgery, which carries a high procedural risk. Advances in endovascular techniques, particularly the use of multibranched endografts such as the T-branch stent graft, have offered a minimally invasive alternative for high-risk patients. However, procedure-related complications, including endoleaks and branch vessel injuries, continue to pose significant challenges.

We report the case of an 84-year-old woman with a history of type B aortic dissection who underwent T-branch endovascular repair for an abdominal aortic aneurysm. Due to unfavorable vascular anatomy, completion of the left renal artery bridging stent was not possible during the initial procedure. The following day, the patient developed hypovolemic shock caused by rupture of a left renal artery branch and a stent-related endoleak. Digital subtraction angiography identified the bleeding source, and combined endovascular embolization using coils and an Amplatzer vascular plug was performed, necessitating sacrifice of the left renal artery. Hemostasis was successfully achieved, and the patient's condition stabilized.

This case underscores the critical role of image-guided interventional therapy in the timely diagnosis and management of life-threatening complications following complex endovascular aortic repair. A combined embolization approach can effectively control endoleaks in multibranched stent systems, highlighting the importance of interdisciplinary collaboration in contemporary vascular treatment.

***Corresponding author:** Ching-Ting Chang, Department of Medical Imaging, Kaohsiung Medical University Gangshan Hospital, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung 820, Taiwan. ORCID iD: 0000-0003-1337-0521.

Submitted: 13.01.2026 **Accepted:** 19.01.2026 **Published:** 26.01.2026

Introduction

Thoracoabdominal aortic aneurysm (TAAA) is a complex lesion that extends across the thoracic and abdominal aortas, frequently involving major branch vessels such as the celiac artery, superior mesenteric artery, and bilateral renal arteries. Although traditional open repair surgery is effective, it is often associated with complications, including massive blood loss and organ ischemia, due to the extensive surgical scope and high procedural risk.

With advancements in endovascular treatment techniques, many traditional open surgeries have gradually been replaced by minimally invasive procedures. Multibranched endografts have become a crucial option for treating thoracic and abdominal aortic aneurysms, enabling reconstruction through minimally invasive methods. This approach significantly reduces surgical invasiveness and minimizes postoperative complications and associated risks [1].

Among these devices, the T-branch stent graft is the most representative, capable of simultaneously connecting the celiac artery, superior mesenteric artery, and bilateral renal arteries. Its modular design enhances clinical feasibility and immediate applicability [2]. Despite this advanced technology, complications such as stent misplacement or endoleak can still occur during the procedure. In such cases, digital subtraction angiography (DSA) and interventional treatment play a crucial role by enabling immediate lesion identification and facilitating hemostasis and repair to ensure stable blood flow after the procedure.

Case Presentation

This case involves an 84-year-old woman who underwent endovascular aortic stenting for a type B aortic dissection 11 years ago and was subsequently followed as an outpatient. Computed tomography (CT) revealed an abdominal aortic aneurysm (AAA) with a maximum diameter of 5.4 cm (Figure 1). Cross sectional imaging confirmed the aneurysm measured 5.4 cm in diameter. The outpatient department recommended further surgery to place a T-shaped, four-branch covered stent. The surgery was performed after four months and proceeded smoothly. However, the left renal artery bridging stent could not be successfully placed due to anatomical constraints related to the vessel angle and blood flow dynamics. Considering the prolonged surgery time, the incision was temporarily closed, and stent placement was rescheduled for the following week.

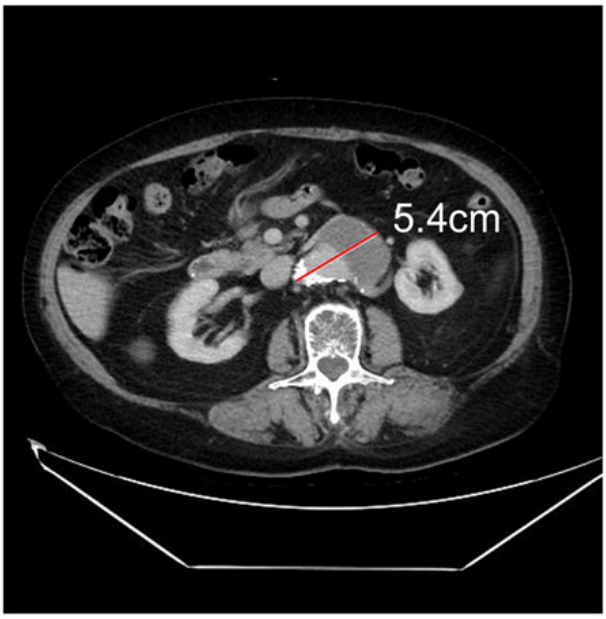

Figure 1: The Preoperative Axial Section of the Abdominal CT Scan Revealed an Abdominal Aortic Aneurysm Measuring 5.4 cm in Diameter.

The following day, the patient developed hypovolemic shock and a palpable mass in the left lower abdomen. Abdominal CT revealed contrast agent leakage within the AAA and the space surrounding the left kidney, indicating a ruptured branch of the left renal artery causing acute hemorrhage and a bridging stent-related endoleak (Figure 2).

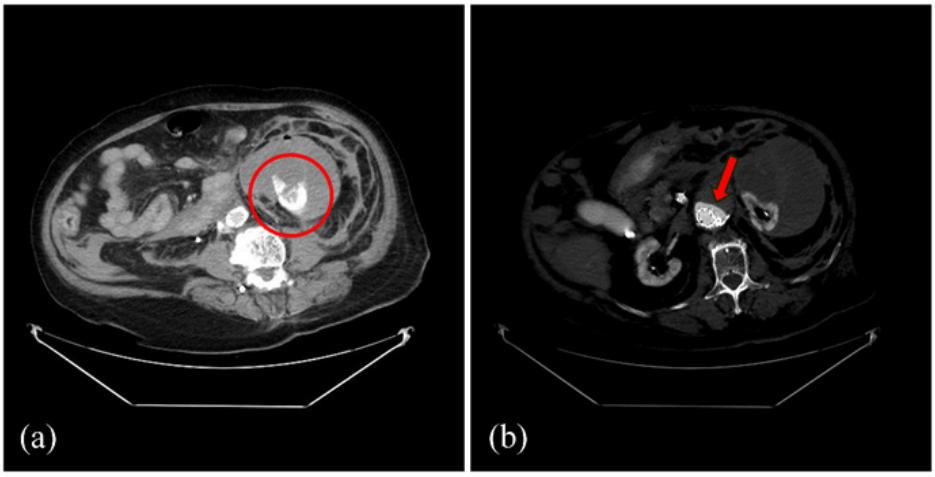

Figure 2: The Abdominal CT Scan Shows (a) the Location of Acute Bleeding (Circled in Red) and (b) the Site of Endovascular Leakage (Indicated by a Red Arrow).

Result

Using DSA-guided interventional treatment, a catheter was inserted into the left brachial artery. The endoleak and bleeding site were identified within the T-shaped four-branch covered stent and the left renal artery. Multiple metal coils were deployed for embolization and hemostasis. To ensure complete closure of the endoleak, the left renal artery had to be sacrificed to achieve a full seal. Consequently, another covered stent was extended from the T-shaped stent into the left renal artery, and an Amplatz vascular plug was placed within the stent lumen to embolize the left renal artery (Figure 3).

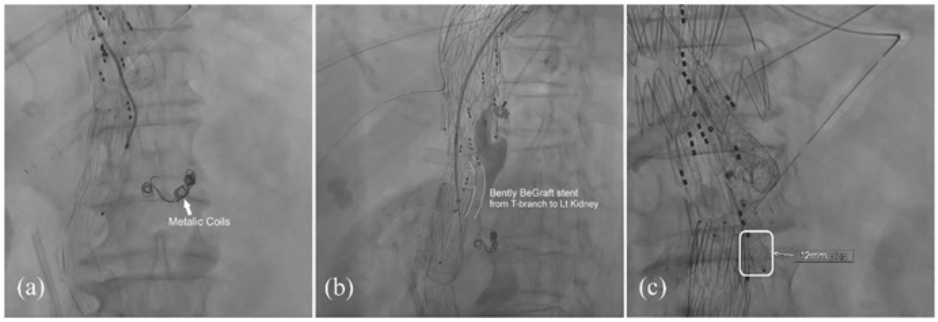

Figure 3: Embolization Materials Used in DSA Include: (a) Embolization with a Metal Coil (Indicated by the White Arrow), (b) A Covered Stent Extending from a T-Shaped Stent to the Left Renal Artery (Indicated by the White Curve), and (c) Placement of an Amplatz Vascular Embolizer to Occlude the Left Renal Artery (Indicated by the White Box).

After embolization, DSA demonstrated complete cessation of bleeding in the left renal artery, with no evidence of contrast extravasation or intravascular leakage (Figure 4). The patient's blood pressure gradually increased, and their clinical condition stabilized.

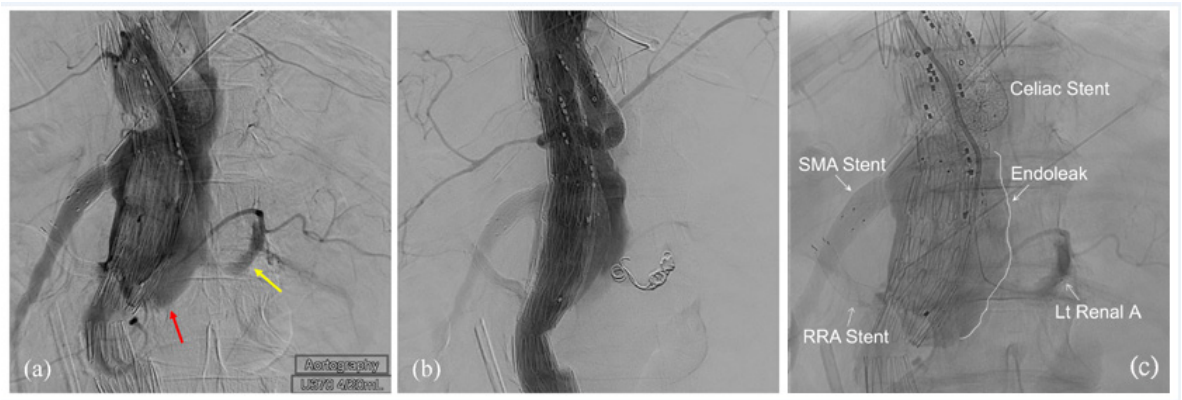

Figure 4: DSA Examination Showed (a) A Pre-Embolization Endoleak (Red Arrow) and Acute Bleeding (Yellow Arrow), and (b) Post-Embolization, the Endoleak and Bleeding were Controlled.(c)No subtraction was observed after post-stenting, and the endoleak did not continue to increase. The multi-branch covered stent was well positioned.

Discussion

In recent years, the treatment strategy for TAAA has gradually shifted from traditional open repair to endovascular reconstruction, offering a less invasive option for elderly or high-risk patients. This shift highlights the critical role of image-guided vascular technology in clinical decision-making [3,4]. However, challenges persist, including limited angles for bridging stents, incomplete branch anastomosis, and endoleaks. When these complications compromise organ blood flow, image-guided interventional therapy is often the primary treatment approach.

The mechanisms underlying endoleaks are diverse, encompassing not only minute gaps at the anastomosis site but also intraoperative vascular tortuosity, stent tension, and differences in branch perfusion pressure. The choice of embolization strategy depends on the endoleak pathway and blood flow characteristics. Compared to single-material embolization, a combined approach can achieve both hemostasis and structural reinforcement simultaneously, particularly in multi-branch stent configurations, thereby improving embolization success rates [5]. This case highlights the critical clinical value of interdisciplinary team collaboration combined with image-guided interventional therapy for the timely diagnosis and management of complex vascular complications.

Reference

1. Rodolfo V Rocha, Thomas F Lindsay, Jan O Friedrich, Shubham Shan, Sidhartha Sinha, et al. (2020) Contemporary outcomes of endovascular and open thoracoabdominal aortic aneurysm repair: a systematic review and meta-analysis. J Vasc Surg 71: 1396 - 1412.
2. Ahmed Eleshra, Mohamed Hatm, Konstantinos Spanos, Giuseppe Panuccio, Fiona Rohlffs, et al. (2022) Early outcomes of t-Branch off-the-shelf multibranched stent graft in elective, urgent, and emergent repair of thoracoabdominal aortic aneurysms. J Vasc Surg 75: 416-424.
3. Tenorio ER, Dias-Neto MF, Lima GBB, Estrera AL, Oderich GS (2021) Endovascular repair for thoracoabdominal aortic aneurysms: current status and future challenges. Ann Cardiothorac Surg 10: 744-767.
4. Tsilimparis N, Bosiers M, Resch T, Torsello G, Austermann M, et al. (2023) Two-year target vessel-related outcomes following use of off-the-shelf branched endografts for the treatment of thoracoabdominal aortic aneurysms. J Vasc Surg 78: 289-298.
5. Field J, Ketting S, Schurink GWH, Mees BME (2020) Ongoing migration of chimney endovascular aneurysm sealing. J Vasc Surg Cases Innov Tech 6: 443.

Copyright: ©2026 Ching-Ting Chang. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.