

# Simultaneous endovascular treatment for the patient with impending ruptured reno-iliac anastomotic bypass aneurysm and superior mesenteric artery thrombosis after prosthetic aorta replacement for abdominal aortic aneurysm.



Fumi Inamasu<sup>1,2)</sup>, Gaku Matsumoto<sup>1)</sup>, Takahiro Sueki<sup>1)</sup>, Kosuke Umeda<sup>1)</sup>, Takumi Yoshino<sup>1)</sup>, Kazuki Hagiwara<sup>1)</sup>, Fumiaki Iwase<sup>1)</sup>

1) Emergency and Critical care medical center, Yamanashi prefectural central hospital, Yamanashi, Japan  
2) Department of Emergency and Critical Care Medicine, Saiseikai Yokohamashi Tobu Hospital, Kanagawa, Japan

## Background

- Both rupture of anastomotic bypass aneurysm and acute mesenteric ischemia are rare but fatal entities.
- There is no literature regarding simultaneous onset of both.
- We report a rare case in which endovascular treatments were successfully achieved for the patient with an impending ruptured reno-iliac anastomotic bypass aneurysm and superior mesenteric arterial (SMA) thrombosis.

## Case: A 58-year-old, male

### Medical History

He was presented to the emergency department with complaints of **sudden abdominal pain, vomiting, and bloody stools.**

### Vital Sign

GCS: E4V5M6, BP 201/100 mmHg, HR 69 /min, SPO2 100% (Room air)

### Blood Test

pH 7.257, PCO2 32.2 mmHg, HCO3- 14.4 mmol/L, BE -11.7 mEq/L, Lac 57 mg/dL

WBC 15700/ $\mu$ L, Hb 10.7 g/dL, PLT 15.4  $\times$  10<sup>9</sup>/ $\mu$ L  
Cre 3.59 mg/dL, BUN 35.8 mg/dL,  
Na 134mmol/L, K 7.9 mmol/L, CRP 1.45 mg/dL

### Physical examination

Peritoneal irritation symptoms (+)

### Past History

-19 years

### Open surgical repair ① for AAA

(Y-graft, Lower abdominal aorta ~ Bilateral CIA, Right RA replacement)  
\* Rt. RA reconstruction was performed using a prosthetic iliac artery by saphenous graft.

-6 years

### Open surgical repair ② for TAAA

(Lower thoracic aorta ~ Upper abdominal aorta, Bilateral RA, SMA, Intercostal artery grafting)

-2 years

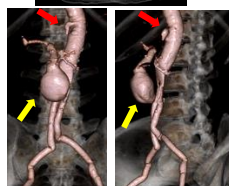
Anastomotic aneurysm in the Rt. RA was diagnosed. → follow up

Current smoker and No family history

### CECT



Yellow: aneurysm ruptured  
Red: SMA thrombosis



### Diagnosis

- Metabolic acidosis, renal failure, hyperkalemia
- Renio-iliac anastomotic bypass aneurysm, ruptured
- SMA thrombosis
- Acute mesenteric ischemia

## Treatment

After intervention for hyperkalemia and acidosis, we performed immediate endovascular therapy.

### Access

- 4Fr → 8Fr short sheath in Rt. brachial artery
  - 4Fr in Lt. femoral artery
- Angiocatheter: 4Fr Pigtail, 4Fr JB-2  
Guiding catheter: 8Fr Launcher

### 1) Aortography via Rt. brachial artery approach (Fig.A)

- The reno-iliac anastomotic bypass was deformed and too tortuous to place a covered stent.
- The orifice of SMA had survived.

### 2) Covered stent for ruptured aneurysm (Fig.B)

- We determined to sacrifice renal blood and deployed GORE® VIABAHN VBX into the Rt. prosthetic common iliac artery including the orifice of renal anastomotic bypass.
- \* Intraoperative contrast was performed via left femoral artery approach with 4Fr Pigtail.
- \* After performing an exchange from 4Fr Pigtail to 4Fr JB-2 using the Rt. brachial artery approach, a lesion cross was performed.
- After that, we confirmed that the aneurysm had disappeared.(Fig.C)

### 3) SMA recanalization, mechanical thrombectomy

- We performed thrombus retrieval for SMA thrombosis using JB2/8Fr Launcher system and TrevoNXT.(Fig.D)
- We successfully achieved reperfusion of SMA, then pre-existing SMA stenosis was revealed.
- We carried out stent placement for that lesion in order to avoid recurrent obstruction of stenotic SMA. (CarotidWall 10/31) (Fig.E)

<The subsequent progress>

- Laparotomy was performed for intestinal ischemia, and small bowel necrosis was partially resected.
- He was initiated renal replacement therapy and transitioned to maintenance hemodialysis.
- He was discharged on day 41.



## Discussion

The incidence of intraabdominal paraanastomotic aneurysms after abdominal aortic bypass grafting were reported from 1% to 15%. The most frequent cause of anastomotic aneurysms is a structural deficiency of the parent artery, followed by arterial hypertension, mechanical stress, defect of the graft material, and noninfective healing complications.

Treatment of ruptured paraanastomotic aneurysm is particularly challenging because of the advanced age and significant comorbidities of the patients and the difficulties associated with approaching the abdominal aorta through previously operated fields.

There are many reports of SMA ischemia after AAA replacement, but most of these are due to arteriosclerosis.

<In this case>The mechanism between impending ruptured reno-iliac anastomotic bypass aneurysm and SMA embolization is unclear, but it is possible that it was involved in an AAA lesion and became thrombosed.

Edwards JM, et al. J Vasc Surg. 1992;15(2):344-353.  
Szlajag DE, et al. Surgery. 1975;78(6):800-816.  
Styrosas GS, et al. Cardiovasc Intervent Radiol. 2008;31  
Eugster T, et al. Ann Vasc Surg. 2005;19(6):411-413.

## Conclusion

We experienced a rare case of successful endovascular treatment for the patient with an impending ruptured renoiliac anastomotic bypass aneurysm and SMA thrombosis after prosthetic aorta replacement.

Abbreviations) SMA: Superior Mesenteric Arterial, AAA: Abdominal Aortic Aneurysm, TAAA: Thoracoabdominal Aortic Aneurysm, CIA: Common Iliac Artery, RA: Renal Artery, Rt.: Right, Lt.: Left, CECT: Contrast-Enhanced Computed Tomography, Fig: Figure