



INTERNATIONAL AORTIC SUMMIT

HILTON ARUBA CARIBBEAN HOTEL
PALM BEACH, ARUBA

OCTOBER 13-15, 2022

ADMINISTRATIVE OFFICE

203 Washington Street, PMB 311 · Salem, Massachusetts 01970 · Telephone: 978-927-7800

Email: ias@administrare.com · www.aorticsummit.com

TARGET AUDIENCE

The International Aortic Summit 2022 is open to all surgeons (vascular and cardiac), cardiologists, radiologists, fellows, residents, medical students, nurse practitioners and physician assistants interested in vascular surgery.

ACCREDITATION INFORMATION

PURPOSE AND CONTENT

The objective of this summit is to unite leaders in the field of vascular and endovascular surgery to present and discuss the latest advances in aortic surgery, and update attendees on both open and endovascular products and procedures. The program will include expert presentations from leaders in the fields of vascular and endovascular surgery, practicing physicians and others focused on acquiring knowledge about the latest advances in aortic surgery. A portion of the program is dedicated to question and answer interaction between the presenters and the audience.

EDUCATIONAL OBJECTIVES

At the end of this activity, participants should be able to:

1. Review the ever-changing management of complex aortic disease surgery
2. Identify more aggressive strategies involving open and endovascular
3. Discuss post-operative surveillance and expectations with new procedures

ACCREDITATION STATEMENT

In support of improving patient care, this activity has been planned and implemented by Amedco, LLC and the International Aortic Summit. Amedco, LLC is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC) to provide continuing education for the healthcare team.

PHYSICIANS (ACCME) CREDIT DESIGNATION

Amedco, LLC designates this live activity for a maximum of 13.75 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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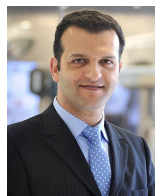


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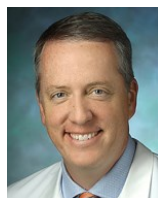
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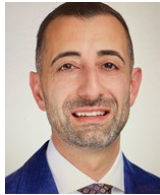
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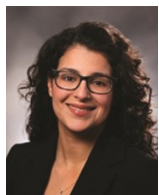
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ACKNOWLEDGEMENTS

The International Aortic Summit organizers wish to recognize and thank the following companies for their marketing and educational grant support of the 2022 International Aortic Summit:

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2022 SCHEDULE-AT-A-GLANCE

WEDNESDAY, OCTOBER 12, 2022

4:00 pm Registration Opens

THURSDAY, OCTOBER 13, 2022

7:00 am Continental Breakfast/Registration/Visit Exhibits

7:50 am Welcome

SESSION 1

Moderator: James McKinsey, MD

8:00 am **The Latest Techniques for Aortic Occlusive Disease that Everyone Should Know**

Sean Lyden, MD

8:05 am Audience Participation & Discussion

8:15 am **Dealing with the Failed EVAR**

Sunita Srivastava, MD

8:20 am Audience Participation & Discussion

8:30 am § *(Fellows Case Presentation 1)*
Salvage of EVAR Collapse with Acute Aortic Occlusion and Paraplegia
Tommaso Cambiaghi, MD, UTHealth, Houston, TX

8:35 am Case Discussion Panel

8:45 am **Endovascular Salvage of Failed EVAR**

James McKinsey, MD

8:50 am Audience Participation & Discussion

9:00 am § *(Fellows Case Presentation 2)*
Open Repair of Type II Endoleak After Failed Endovascular Management
Ezra Koh, MD, Houston Methodist Hospital, Houston, TX

9:05 am Case Discussion Panel

9:15 am

DEBATE

(15-minute debate; 15-minute discussion)

Severe Aorto-Iliac Occlusive Disease Should Be Endovascular First

Daniel Clair, MD

Open Surgery Reigns Supreme For Severe Aorto-Iliac Occlusive Disease

Timur Sarac, MD

9:45 am

Audience Participation & Discussion

10:00 am

Coffee Break/Visit Exhibits

SESSION 2

Moderator: Darren B. Schneider, MD

10:30 am

Dealing with Infected EVARS: Tips from #InTheBucket

Frank Caputo, MD

10:35 am

Audience Participation & Discussion

10:45 am

Chronic Thoracoabdominal Aneurysm Secondary to Aortic Dissection: Endovascular Lessons Learned

Javairiah Fatima, MD

10:50 am

Audience Participation & Discussion

11:00 am

§ *(Fellows Case Presentation 3)*
Endovascular Management of Aortic Stump Blowout by Parallel Grafting and Coil Embolization of Visceral Aorta
Kofi Quaye, MD, Duke University Medical Center, Durham, NC

11:05 am

Case Discussion Panel

11:15 am

Customization and Back-Table Solutions to Fit Hostile AAA Anatomy
Mazin Foteh, MD

11:20 am

Audience Participation & Discussion

11:30 am

§ *(Fellows Case Presentation 4)*
Thoracoabdominal Aneurysm Secondary to Dissection: Great Repair, Not So Great Outcome
Mikael Fadoul, MD, Cooper University Hospital, Camden, NJ

11:35 am

Case Discussion Panel

(§) Fellows—Case Presentation

11:45 am	DEBATE <i>(15-minute debate; 15-minute discussion)</i> "Jim is Wrong - TEVAR has a Substantial Role in Marfan Patients" Darren B. Schneider, MD	2:45 pm	§ <i>(Fellows Case Presentation 6)</i> Covered Endovascular Reconstruction of the Aortic Bifurcation in Hypoplastic Aortoiliac Syndrome Joshua Geiger, MD, University of Rochester, Rochester, NY
	"Darren is Wrong - Marfan TAAA is an Open Solution Only!" James H. Black, MD	2:50 pm	Case Discussion Panel
12:15 pm	Audience Participation & Discussion	3:00 pm	§ <i>(Fellows Case Presentation 7)</i> A Case of Ruptured Inferior Mesenteric Artery in an Undiagnosed Vascular Ehlers-Danlos Patient Sarah Loh, MD, Yale New Haven Hospital, New Haven, CT
12:30 pm	Lunch – All Attendee		
12:30 pm	Lunch – Cook Fellows Program		
	SESSION 3 Moderator: Francis Caputo, MD	3:05 pm	Case Discussion Panel
		3:30 pm	Silk Road Medical Fellows Program
1:45 pm	§ <i>(Fellows Case Presentation 5)</i> Type II Thoracoabdominal Aortic Aneurysm Treated with Branched Stented Anastomosis Frozen Elephant Trunk Repair and Thoracoretroperitoneal Abdominal Aortic Aneurysm Repair Complicated by Rupture Melissa Day, MD, Cleveland Clinic Foundation, Cleveland, OH (Virtual)	6:30 pm	Welcome Reception <i>(All Attendees)</i>
		7:30 pm	Faculty Dinner <i>(By Invitation)</i>
		FRIDAY, OCTOBER 14, 2022	
		7:00 am	Fellows Breakfast Session <i>Sponsored by Inari</i>
		7:30 am	Continental Breakfast/Visit Exhibits
1:50 pm	Case Discussion Panel		
	SESSION 4 Moderator: James Black, MD		
2:00 pm	Zone 2 Concept: Concomitant Frozen Elephant Trunk vs. TEVAR Joshua Grimm, MD	8:00 am	The Challenges in Patient Centered Outcomes in Treating Patients with Aortic Dissection Sherene Shalhub, MD (Virtual)
2:05 pm	Audience Participation & Discussion		
2:15 pm	Utilization of Radiation-Free Catheter Guidance for Complex Endovascular Aneurysm Repair Darren Schneider, MD	8:05 am	Audience Participation & Discussion
2:20 pm	Audience Participation & Discussion	8:15 am	Hybrid Thoracoabdominal Aneurysm Repair is the Best of Both Worlds James Black, MD
2:30 pm	Hostile Neck Anatomy for Juxtarenal AAA: The Non-CMD Playbook Carlos Bechara, MD	8:20 am	Audience Participation & Discussion
2:35 pm	Audience Participation & Discussion	8:30 am	§ <i>(Fellows Case Presentation 8)</i> Supra-Aortic Trunk Vessels Reconstruction with Deep Femoral Vein to Treat Infected Cervical De-Branching PTFE Bypass after Zone 0 TEVAR in Patient with Ruptured TBAD Kevin Engledow, MD, Long School of Medicine/UT Health San Antonio, San Antonio, TX

(§) Fellows – Case Presentation

8:35 am	Case Discussion Panel	10:50 am	§ (Fellows Case Presentation 11) Innominate Artery Coverage during TEVAR after Aortic Debranching Paul Haddad, MD, Houston Methodist Hospital, Houston, TX
8:40 am	Technical Pearls of Insitu Fenestration for Complex Aortic Endografting Jean M. Panneton, MD		
8:45 am	Audience Participation & Discussion	10:55 am	Case Discussion Panel
8:55 am	Technical Pearls of Endovascular Thoracoabdominal Aneurysm Repair: What I've Learned and How it can Help You Matthew Eagleton, MD	11:00 am	Lessons Learned in Treating Aorto-Caval Fistula Nick Mouawad, MD
9:00 am	Audience Participation & Discussion	11:05 am	Audience Participation & Discussion
9:15 am	§ (Fellows Case Presentation 9) 81-Year-Old with Thoracic Aortic Aneurysm and Shaggy Aortic Disease Underwent Complex TEVAR, Complicated by Closure Device Failure, Spinal Cord Ischemia, and Acute Mesenteric Ischemia, Resulting in Death Ryan Gedney, MD, Medical University of South Carolina, Charleston, SC	11:15 am	§ (Fellows Case Presentation 12) Thoracic Endovascular Aortic Repair for Descending Thoracic Aortic Aneurysm with Endovascular and Open Repair of Access Related Complications Jake Forman, DO, Florida Atlantic University Charles E. Schmidt College of Medicine, Boca Raton, FL
9:20 am	Case Discussion Panel	11:20 am	Case Discussion Panel
9:30 am	Coffee Break/Visit Exhibits	11:25 am	Innovative Open Surgical Techniques for TAAA Laurent Chiche, MD
	SESSION 5 Moderator: Laurent Chiche, MD	11:30 am	Audience Participation & Discussion
10:00 am	DEBATE (15-minute debate; 15-minute discussion) Type A Dissections with Visceral Malperfusion Should be First Fenestrated Prior to Central Decompression Himanshu Patel, MD (Virtual) Type A Dissection Should be Immediately Treated by Central Decompression G. Chad Hughes, MD	11:40 pm	§ (Fellows Case Presentation 13) Transaortic Hybrid Repair of a Type III Thoracoabdominal Aortic Aneurysm in Takayasu's Arteritis David Blitzer, MD, University of Maryland Medical Center, Baltimore, MD
10:30 am	Audience Participation & Discussion	11:45 pm	Case Discussion Panel
10:40 am	§ (Fellows Case Presentation 10) Endovascular Management of Traumatic Aortoiliac Rupture with Acute Limb Ischemia Hanaa Aridi, MD, Indiana University Health, Indianapolis, IN	12:00 pm	Lunch Symposium <i>Sponsored by Endologix</i>
10:45 am	Case Discussion Panel		SESSION 6 Moderator: Ali Azizzedeh, MD
		1:15 pm	§ (Fellows Case Presentation 14) Endovascular Arch Repair of Chronic Residual Type A Aortic Dissection with Dual Branch Stent Graft Domingo Uceda, MD, University of Pennsylvania Health System, Philadelphia, PA
		1:20 pm	Case Discussion Panel

(§) Fellows—Case Presentation

1:25 pm	The Path Forward in Treating Type A Dissection: Where We are and Where are We Going? G. Chad Hughes, MD		SATURDAY, OCTOBER 15, 2022
		8:00 am	Continental Breakfast/Visit Exhibits
1:30 pm	Audience Participation & Discussion		SESSION 7 Moderator: Sharif H. Ellozy, MD
1:40 pm	§ <i>(Fellows Case Presentation 15)</i> The Irony of it All: TEVAR Induced Aneurysm Jennifer Perri, MD, Duke University Medical Center, Durham, NC	8:30 am	Chasing the Type II Endoleak: When is Enough Enough? Neal Cayne, MD
1:45 pm	Case Discussion Panel	8:35 am	Audience Participation & Discussion
1:50 pm	Is Arch Branch Technology Ready for Prime Time? What are our Limiting Factors? Himanshu Patel, MD (Virtual)	8:45 am	Endovascular Solutions with Supra-Aortic Trunk Lesions Michael Stoner, MD
1:55 pm	Audience Participation & Discussion	8:50 am	Audience Participation & Discussion
2:05 pm	High Risk Features in Type B Aortic Dissection: When Should You Act? Eanas Yassa, MD	9:00 am	Training Tomorrow's Aortic Surgeon: Barriers and Opportunities Sharif H. Ellozy, MD
2:10 pm	Audience Participation & Discussion	9:05 am	Audience Participation & Discussion
2:20 pm	§ <i>(Fellows Case Presentation 16)</i> Ruptured Infected Aortic Stump – A Disaster Case Mehdi Teymouri, MD, Vascular Health Partners, Latham, NY	9:15 am	Ascending and Arch Solutions for Residual Type B Dissection Nikos Tsilimparis, MD (Virtual)
2:25 pm	Case Discussion Panel	9:20 am	Audience Participation & Discussion
2:30 pm	Timing for Type B Aortic Dissection is Imperative for Good Outcomes Ali Azizzadeh, MD	9:30 am	DEBATE <i>(15-minute debate; 15-minute discussion)</i> A Short Neck is a Bad Neck - It's FEVAR or Open or Nothing Bruce Tjaden, MD
2:35 pm	Audience Participation & Discussion		We Need Short Neck EVAR Devices and This is Why Sharif H. Ellozy, MD
3:00 pm	Medtronic Fellows Program		
6:30 pm	All Attendee Dinner	10:00 am	Coffee Break
		10:15 am	The Need for Development of Physician Modified Solutions for the Aorta Devon Fromer, MD
		10:20 am	Audience Participation & Discussion

(§) Fellows—Case Presentation

- 10:30 am **Predictors of Intervention in Acute Type B Intramural Hematoma and Penetrating Aortic Ulcer**
Francesco Squizzato, MD
- 10:35 am Audience Participation & Discussion
- 10:45 am **Endovascular False Lumen Exclusion: What I Have Learned**
Manish Mehta, MD, MPH
- 10:50 am Audience Participation & Discussion
- 11:00 am **Options in Arch Management in Type A Dissection vs. B-0 varieties**
Joshua Grimm, MD
- 11:05 am Audience Participation & Discussion
- 11:15 am Adjourn

NOTES

2022 IAS VASCULAR RESIDENT AND FELLOW CASE COMPETITION

THURSDAY, OCTOBER 13, 2022

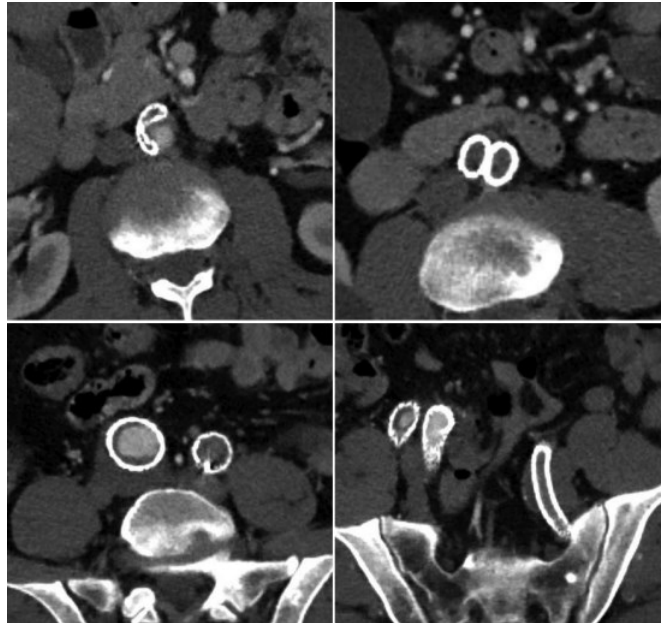
8:30 am § *(Fellows Case Presentation 1)*
**Salvage of EVAR Collapse with Acute
Aortic Occlusion and Paraplegia**
Tommaso Cambiaghi, MD, UTHealth,
Houston, TX

INTRODUCTION: Endovascular aortic aneurysm repair (EVAR) is a minimally invasive approach to abdominal aortic aneurysms which relies on thorough preoperative planning and sizing of devices based on patient anatomy. Proximal sealing of the aneurysm is achieved by oversizing the graft diameter by 10-20% compared to the aortic neck. However, excessive oversizing can result in graft infolding and consequent type Ia endoleaks.

CASE: We present the case of a 61-year-old male who had undergone infrarenal EVAR, right iliac branched endoprosthesis and left internal iliac artery covered stenting for aneurysms of the right common iliac artery and the left internal iliac artery. Two months after the index procedure he presented to the emergency department with acute onset of back pain which progressed to bilateral lower extremity paraplegia and anesthesia. On physical exam his femoral and pedal pulses were absent. Computed tomography angiography demonstrated collapse of the proximal aortic stent-graft with thrombosis of the bilateral common iliac limbs and of the left internal iliac artery stent (Figure). He underwent bilateral over the wire Fogarty thrombectomy, 40mm x 10mm Palmaz balloon-expandable stent placement at the proximal endograft, relining of the iliac limbs with covered stents, and aspiration thrombectomy of the left internal iliac artery. Pelvic and lower extremity perfusion was restored at the completion of the procedure. The patient regained motor function on post-operative day 0, and gradually regained sensory function. He was discharged on post-operative day 6 on aspirin 81mg and low dose direct oral anticoagulants.

CONCLUSION: Endograft collapse is a rare complication which can stem from proximal aortic dissection or excessive graft oversizing. Immediate interventional management is necessary to limit ischemic complications resulting from graft thrombosis.

Figure.



9:00 am § *(Fellows Case Presentation 2)*
**Open Repair of Type II Endoleak After
Failed Endovascular Management**
Ezra Koh, MD, Houston Methodist
Hospital, Houston, TX

INTRODUCTION: Endoleaks are seen in up to 20% of patients after undergoing endovascular aortic repair (EVAR). We report a case of persistent type II and III endoleak after EVAR requiring open repair after unsuccessful endovascular management.

CASE REPORT: A 78-year-old male who had undergone EVAR in 2019 for a 6 cm abdominal aortic aneurysm presented to the hospital with nausea and vomiting and was found to have persistent aneurysm sac filling. Computed tomography angiography (CTA) showed a type Ib endoleak

from the right iliac limb of the preexisting endograft and a possible type II endoleak from a patent inferior mesenteric artery. After coil embolization of the inferior mesenteric artery and extension of the right limb, the patient's symptoms persisted and a type II endoleak from the left 4th lumbar artery was still visible on dynamic CTA.

Therefore, we opted to perform open transperitoneal exploration of the stent-graft to treat the endoleak. The aneurysm sac was opened longitudinally over the indwelling stent-graft, after which the lumbar arteries were oversewn. Additionally, a type III endoleak was identified from the fabric of the right limb of the endograft which was covered circumferentially with felt. The patient recovered well from surgery and was discharged home. Follow-up CTA showed no evidence of endoleak.

DISCUSSION: While in the current era of endovascular aortic surgery most endoleaks can be managed percutaneously, certain cases still necessitate open intervention for definitive treatment. Dynamic CTA can be utilized preoperatively to localize endoleaks for operative planning.

11:00 am § *(Fellows Case Presentation 3)*
Endovascular Management of Aortic Stump Blowout by Parallel Grafting and Coil Embolization of Visceral Aorta
 Kofi Quaye, MD, Duke University
 Medical Center, Durham, NC

INTRODUCTION: Infections of implanted aortic endografts after both open and endovascular surgery remains a dreaded cause of morbidity and mortality for aneurysmal disease. With incidence ranging from 0.5% to 2%¹, they are often managed by either in-situ replacement or extra-anatomic bypass with graft excision. In the latter, graft explantation leaves an infrarenal aortic stump which can be subject to suture line dehiscence and catastrophic stump blowout. Classically, there have not been ideal endovascular options to treat stump blowout in patients with a hostile abdomen, or in those who are unable to undergo a major laparotomy. The case herein describe a novel endovascular technique for addressing aortic stump blowout.

CASE: The patient is a 74-year-old male with a past medical history notable for severe coronary artery disease, who had undergone an open AAA repair 15 years previously. More recently, he had a sigmoidectomy for colon CA, and in August 2020, presented to the emergency department with massive melena and hematemesis requiring active transfusion for class II hemorrhagic shock. CTA of the

abdomen and pelvis demonstrated a large pseudoaneurysm at the distal anastomosis with likely erosion into the small bowel. With severe coronary arterial disease and heart failure, he was felt to be a poor candidate for immediate open surgical repair and underwent an urgent EVAR for temporization. Five days postoperatively, he underwent an exploratory laparotomy with segmental jejunal resection and debridement of his pseudoaneurysm sac. He was discharged home with a plan for chronic suppressive antibiotics and medical optimization. Unfortunately, the patient was noncompliant with the antibiotic regimen and failed to follow up. He represented to the emergency department July 2021 with severe abdominal pain, melena, and vancomycin resistant enterococcus bacteremia where he was found to have recurrent aortoenteric fistula; his echocardiogram at this time noted a worsened ejection fraction of 25% in addition to new, severe, mitral regurgitation. He underwent staged axillary bi-femoral bypass followed by aortic graft excision with jejunal repair and closure of the aortic stump.

After discharge, and again lost to follow-up, he represented in extremis on 12/13/21 with CTA showing active extravasation from his aortic stump in the pararenal/visceral aorta. Given his severe cardiac function coupled with multiple prior laparotomies, we did not feel that an open approach to the visceral aorta was feasible. He was thus taken emergently to the hybrid OR where his axillary-bifemoral bypass graft was accessed under local anesthesia only, and a 12Fr sheath was placed into the descending aorta. The SMA and bilateral renal arteries were cannulated with guide wires in place and the visceral aorta was coil embolized, with visceral perfusion restored via balloon expandable stent grafts passed over the aforementioned guidewires through the coil packs. Residual periaortic fluid collection was addressed with a percutaneous drain the following day. He was discharged home 14 days postoperatively tolerating a regular diet and with normal bowel function. Drain cultures grew VRE and E. coli and he completed a 28 day course of IV antibiotic therapy followed by removal of the drain.

DISCUSSION: Hybrid endovascular and open surgical procedures for patients with secondary AEF in the infrarenal location have been previously described². Our case, however, illustrates a novel technique for management of aortic stump blowout with involvement of the visceral aorta where preservation of renal and mesenteric vessels is essential. By parallel stent grafting the SMA and bilateral renal arteries through an aortic coil pack, we were able to occlude the visceral aorta under local anesthesia while maintaining visceral perfusion. This technique may be the only viable option for patients with severe comorbidities who are unlikely to survive a hemodynamic instability from general anesthesia and repeat laparotomy with aortic cross-clamping.

¹Seeger JM. Management of patients with prosthetic vascular graft infection. *American Surgeon* 2000;66(2):166-77.

²Case Reports *Ann Vasc Surg* 2016 Jan;30:310.e9-15. doi: 10.1016/j.avsg.2015.07.034. Epub 2015 Oct 30. Use of Aortic Occluders and Endovascular Plugs in a 2-step Hybrid Treatment of Secondary Aortoenteric Fistulas

11:30 am § (Fellows Case Presentation 4)
Thoracoabdominal Aneurysm Secondary to Dissection: Great Repair, Not So Great Outcome
 Mikael Fadoul, MD, Cooper University Hospital, Camden, NJ

INTRODUCTION: With the increased availability of fenestrated endografts, their utilization and indications have been expanded for cases that would otherwise require open surgical repair. While they provide a minimally invasive approach to complex aneurysm repair, they are not without their pitfalls. Complications with these devices have been reported, predominantly with difficulty cannulating one of the fenestrations. We describe a bailout maneuver with a Z-fen in the setting of an inability to cannulate both fenestrations with an associated flow-limiting SMA dissection.

CASE REPORT: A 67 year-old male with a past medical history notable for hypertension, hyperlipidemia, diabetes mellitus and abdominal aortic aneurysm presented to the emergency department with abdominal pain. Of note, he had undergone ultrasonography in the outpatient setting two months prior demonstrating growth to 5.7 cm from 3.1 cm the year prior. CTA performed in the emergency department demonstrated a 5.7 cm pararenal aneurysm as well as appendicitis. He underwent a laparoscopic appendectomy with plans for elective repair of his aneurysm. Fenestrated repair was planned with a Z-fen

using two fenestrations, one for the right renal and one for the SMA as well as a left renal snorkel. Intra-operatively the left renal artery was cannulated from the left axillary access. The fenestrated graft was then partially deployed, and the right renal and SMA fenestrations were attempted to be cannulated. The right renal was cannulated with a wire but a catheter was unable to be advanced. The SMA was unable to be cannulated. Repeat angiogram demonstrated lack of antegrade flow into the SMA, with collateral filling via the PDA. There was concern for a flow-limiting dissection and due the radiation dose had reached critical levels. At this point we elected to abandon the fenestrated repair, and as a bailout, the Z-fen fenestrated piece was deployed in the descending thoracic aorta. The SMA was then cannulated from the axillary access and stented with 6 mm Visi-pro stents with restoration of antegrade flow.

CONCLUSION: While fenestrated endografts can reduce the morbidity and mortality of complex aortic repair, they are not without their pitfalls. Complications with these devices have been reported, predominantly with difficulty cannulating one of the fenestrations. We describe a bailout maneuver with a Z-fen in the setting of an inability to cannulate both the right renal and SMA fenestrations with an associated flow-limiting SMA dissection.

1:45 pm § (Fellows Case Presentation 5)
Type II Thoracoabdominal Aortic Aneurysm Treated with Branched Stented Anastomosis Frozen Elephant Trunk Repair and Thoracoretroperitoneal Abdominal Aortic Aneurysm Repair Complicated by Rupture
 Melissa Day, MD, Cleveland Clinic Foundation, Cleveland, OH (Virtual)

BACKGROUND: Many patients with aortic dissections progress to aneurysmal degeneration, often resulting in the formation of extensive thoracoabdominal aortic aneurysms.

CASE PRESENTATION: We report an interesting case of chronic type B aortic dissection with type II thoracoabdominal aortic aneurysm from the aortic root to iliac arteries in a patient who underwent staged repair with Branched Stented Anastomosis Frozen Elephant Trunk Repair (B-SAFER) followed by thoracoretroperitoneal abdominal aortic aneurysm repair which was complicated by intra-operative ruptured false lumen with subsequent extension of false lumen tear.

DISCUSSION: This case emphasizes the innovative hybrid approaches by cardiac and vascular surgery for the surgical repair of complex thoracoabdominal aortic aneurysms and highlights the management of intra-operative aortic rupture.

2:45 pm § (Fellows Case Presentation 6)
Covered Endovascular Reconstruction of the Aortic Bifurcation in Hypoplastic Aortoiliac Syndrome
 Joshua Geiger, MD, University of Rochester, Rochester, NY

A 48-year-old female with a 3-year history of bilateral leg pain presented as an outpatient. Over the past year, her symptoms progressed to lifestyle limiting claudication in her calves, thighs, and buttocks with a maximum walking distance of half a block. Her past medical history includes sarcoidosis, fibromyalgia, and nonischemic cardiomyopathy (EF:54%, CI:1.4LPM/m²). Exam revealed nonpalpable femoral, popliteal, and pedal pulses bilaterally with mildly reduced ABIs. A noncontrasted CT abdomen and pelvis was previously obtained demonstrating a 7mm distal aorta with a potential focal stenosis, in addition to vascular findings consistent with hypoplastic aortoiliac syndrome. Given these findings, the patient was brought to the catheterization laboratory for angiography.

Retrograde right common femoral access was obtained and aortography performed (Figure 1). Two focal stenoses were identified. One at the level of the aortic bifurcation and the second in the mid-infrarenal aorta. There was an associated 60 mmHg pressure differential with no evidence of outflow disease. Given this and results from cases series on hypoplastic aortoiliac syndrome, the decision was made to treat the lesion with a covered endovascular repair of the aortic bifurcation (CERAB). An 8 x 39 mm Viabahn VBX (Gore, Flagstaff, AZ) balloon expandable covered stent into the infrarenal aorta covering the proximal lesion. We then deployed two 6 x 57 mm VISI-pro (Medtronic, Dublin, Ireland) balloon expanding stents into the bilateral common iliac arteries landing the proximal edge into the distal portion of the previous aortic stent. Follow-up aortography demonstrated a remaining nonopacification at the left proximal edge of the aortic stent. Aortic angioplasty was performed to obtain better apposition to the aortic wall. However, the filling defect remained and was treated with a 10 x 40 mm EPIC (Boston Scientific, Marlborough, MA) self-expanding stent (Figure 2).

Right CFA access was closed with a Perclose ProGlide™ (Abbott, Chicago, IL) device and access angiography

demonstrated near complete stenosis of the distal R CFA (Figure 3A). Retrograde R SFA access was obtained using ultrasound guidance and an 0.014 wire was passed through the CFA stenosis. A 4 mm Coyote Monorail (Boston Scientific, Marlborough, MA) balloon was deployed at the level of the CFA and angioplasty was performed to alleviate the stenosis. The proglide suture was tightened and the 4 mm balloon slid easily through the CFA and SFA demonstrating resolution of the stenosis. This was confirmed with repeat access angiography (Figure 3C). Right SFA and left CFA access were closed with manual pressure. The patient was started on aspirin and loaded with 150 mg Plavix (Bristol Myers Squibb, New York, NY). At her follow-up clinic visit her ABIs returned to normal and she had resolution of all claudication symptoms.

This case highlights successful management of hypoplastic aortic syndrome and an intraprocedural access complication. Authors will highlight relevant imaging, differential decision making and review of the literature to facilitate audience participation.

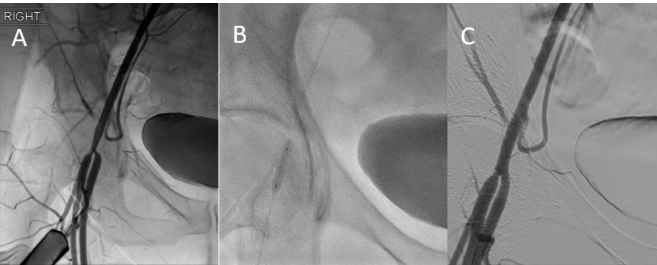
Figure 1. Aortogram demonstrating focal stenosis at the level of the aortic bifurcation and in the mid-infrarenal aorta. Notably, the aorta and iliac arteries are hypoplastic.



Figure 2. Completion imaging after endovascular repair of the aortic bifurcation.



Figure 3. (A) A R Common femoral critical stenosis developed after deployment of the proglide closure device. (B) The complication was managed with distal R SFA access and balloon angioplasty of the stenosis resulting in (C) resolution of the stenosis.



3:00 pm § (Fellows Case Presentation 7)

A Case of Ruptured Inferior Mesenteric Artery in an Undiagnosed Vascular Ehlers-Danlos Patient

Sarah Loh, MD, Yale New Haven Hospital, New Haven, CT

A 33-year old female with a past medical history of recurrent dislocated shoulder, fibromyalgia, and Achilles tendon rupture was transferred to our institution with a 1-week history of right flank pain and a new right renal artery dissection with partial renal infarction. Prior to arrival at our institution, therapeutic anticoagulation was initiated and due to persistent pain, a new CTA was obtained which demonstrated new aneurysms of both her inferior mesenteric artery and left internal iliac artery.

Twenty-four hours after her arrival, she suddenly became hypotensive to 60s/30s, complained of abdominal pain, and had a subsequent syncopal episode. She was intubated and started on vasopressors. Being too unstable for CT scan, she was brought to the hybrid Operating Room for emergent exploration.

A right femoral artery cutdown was performed and the arterial tissue was noted to be very friable. An aortogram demonstrated aneurysms of the inferior mesenteric artery as well as the internal iliac artery, without extravasation.

The patient had clear abdominal compartment syndrome; therefore, a midline laparotomy was performed and a massive hematoma was evacuated. The inferior mesenteric artery aneurysm was identified and appeared disrupted. This was suture ligated. During exposure, both the IVC and aorta were again noted to be friable and easily disrupted with gentle manipulation by even fingertip pressure. Several attempts were made to repair vascular injuries with 4-0 Prolene sutures; however, the vessels were unable to hold even pledgeted sutures. At this point, there was clinical suspicion for Ehlers-Danlos Syndrome. Multiple hemostatic agents were applied to the aorta and IVC and the abdomen was packed.

She remained stable in the Surgical ICU and was taken back to the Operating Room 3 days later for re-exploration and abdominal closure. Subsequently, genetic testing revealed COL3A1 gene, consistent with Ehlers-Danlos, Vascular Type.

She had a prolonged hospitalization course including a right renal subcapsular hematoma which did not require intervention, right-sided hemothorax, and right femoral artery rupture requiring resection of infected femoral artery, interposition graft, and sartorius myoplasty. She was ultimately discharged home in a stable medical condition.

Clinical suspicion of Vascular Ehlers-Danlos should be high in young patients who present with unusual vascular findings and a suggestive history. Operative management in these patients is challenging, and dissection with minimal tissue disruption is necessary.

Figure 1: CT scan demonstrating new aneurysms of the inferior mesenteric artery (left panel) and left internal iliac artery (right panel).

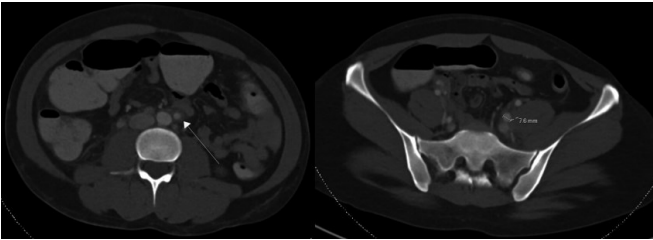
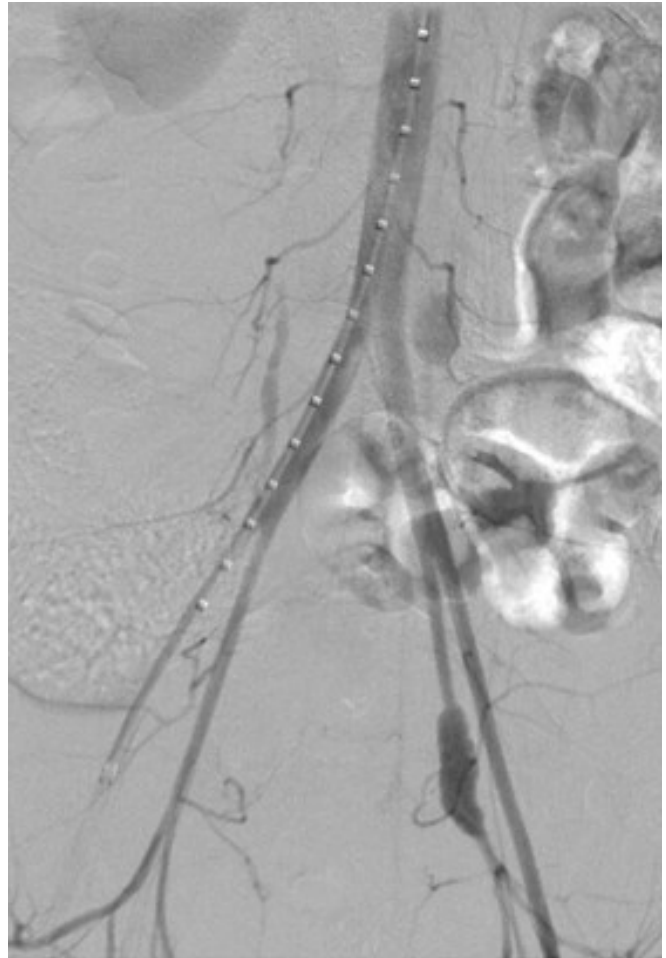


Figure 2: Aortogram via right common femoral access demonstrating inferior mesenteric artery aneurysm and left internal iliac artery aneurysm.



FRIDAY, OCTOBER 14, 2022

8:30 am § (Fellows Case Presentation 8)
**Supra-Aortic Trunk Vessels
 Reconstruction with Deep Femoral Vein
 to Treat Infected Cervical De-Branching
 PTFE Bypass after Zone 0 TEVAR in
 Patient with Ruptured TBAD**
 Kevin Engledow, MD, Long School of
 Medicine/UT Health San Antonio, San
 Antonio, TX

DEMOGRAPHICS: A 49-year-old woman with history of ascending aortic replacement in 2008 for type A aortic dissection, chronic TBAD, pulmonary hypertension presented with impending rupture of Type B Aortic Dissection (TBAD).

HISTORY: The patient presented with acute onset severe chest pain and back pain. Computed tomography angiography (CTA, Image 1.) demonstrated a TBAD with a tear at the innominate. Dissection extended into the bilateral carotid arteries, left subclavian artery and down to Zone 9, terminal aorta. The mid descending thoracic aorta showed impending rupture with significant change in aortic diameter from previous CTA. She was deemed not a candidate for open repair due to comorbidities and prior surgical history.

PLAN: She underwent emergent hemiarch debranching with externally support PTFE graft and zone 0 TEVAR (Medtronic 32 mm x 32 mm x 150 mm proximal, extended distally to 4 cm above celiac with 36 mm x 36 mm x 150 mm, 38 mm x 38 mm x 150 mm and 44 x 44 x 150 mm) with innominate artery chimney graft with 11 mm x 59 mm VBX stents, post-dilated with a 16 mm balloon with the “eye of the tiger” technique (Image 2.). Postoperatively, she was neurologically intact. She was emergently reintubated due to respiratory failure on POD#3 and on POD#10, she developed foul smelling, purulent discharge from the left neck incision, on exploration this was tracking down to the subclavian anastomosis (Image 3). Therefore, the decision was made to proceed with reconstruction of the supra-aortic trunk vessels with deep femoral veins and explantation of the PTFE cervical bypass grafts. The deep femoral vein mapping was negative for DVT and had adequate vein for reconstruction. She subsequently underwent bilateral femoral vein harvest, right axillary to left axillary bypass with anterior chest subcutaneous tunnel and jump bypass to left common carotid artery in a “Y” configuration with explantation of PTFE prosthetic graft and left neck drain placement (Image 4 and 5). Four weeks later, she underwent left subclavian artery ostium embolization to prevent filling of the false lumen and extension of chimney further into the innominate artery. She remained neurologically intact

throughout these operations and was discharged 6 weeks after admission. She was seen one month after discharge. She had palpable pulses in bilateral upper extremities and was neurologically intact.

DISCUSSION: This case illustrates the successful management of infected cervical debranching grafts with reconstruction of supra-aortic trunk vessels with deep femoral vein and explantation of prosthetic cervical graft. Management of complex aortic dissection requiring Zone 0 or 1 TEVAR with supra-aortic trunk debranching remains challenging. Infectious complication of these bypasses can be catastrophic. Reconstruction of supra-aortic bypasses with deep femoral veins is feasible and is an excellent option in the setting of infection.

Image 1. Preoperative CTA

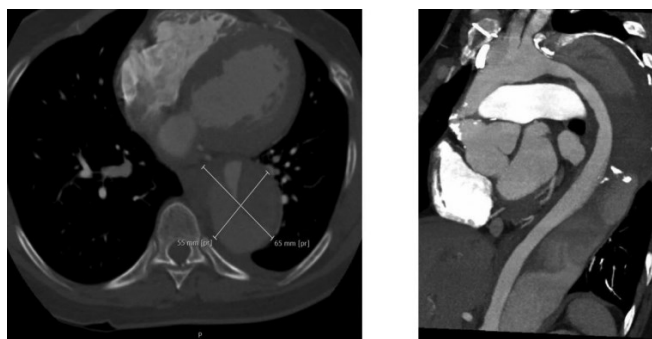


Image 2. Zone 0 TEVAR with innominate chimney and hemi-arch debranching



Image 3. Intraoperative wound image



Image 4. Supra-aortic trunk vessels reconstruction with deep femoral vein

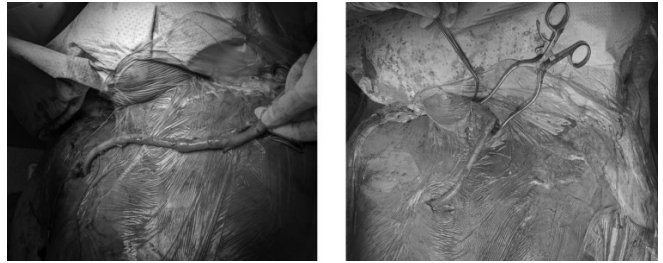


Image 5. Post-operative image after right to left axillary bypass and jump bypass to left carotid and explantation of PTFE bypass



9:15 am § (Fellows Case Presentation 9)
81-Year-Old with Thoracic Aortic Aneurysm and Shaggy Aortic Disease Underwent Complex TEVAR, Complicated by Closure Device Failure, Spinal Cord Ischemia, and Acute Mesenteric Ischemia, Resulting in Death
 Ryan Gedney, MD, Medical University of South Carolina, Charleston, SC

Shaggy aortic disease is associated with embolic complications in the perioperative period when treated with TEVAR. We present here the case of an 81-year-old female that initially presented with lower chest tightness radiating to her back. CT angiogram demonstrated a 6.9cm mid-descending thoracic aortic aneurysm, with extensive mural thrombus and ulcerations throughout the aneurysmal components, a tortuous thoracic aorta, as well as severe renal artery stenosis bilaterally. The patient was taken for TEVAR. A Terumo thoracic stent graft was advanced through 20 French right common femoral artery access, but there was great difficulty in advancing pasting the distal aortic arch. Two stiff Lunderquist wires were required from a left common femoral artery access to allow the Terumo device to advance and be deployed from Zone 3 to Zone 5 of the thoracic aorta. Closure device failure required right common femoral endarterectomy and right common iliac artery stent. Post-operatively, the patient developed bilateral lower extremity paralysis from acute spinal cord ischemia, and a lumbar drain was placed. In the setting, the patient also rising lactic acid levels, and a CTA was performed demonstrating SMA thrombus and focal aortic dissection at the level of the SMA. She was taken to the operating room for SMA thrombectomy. Via a left common femoral 8 French access, a Cat 7 Penumbra catheter was advanced to the SMA but was unable to fully clear the thrombus, so an open SMA exposure was performed and open thrombectomy was able to restore flow. There was a significant amount of ischemic and necrotic bowel, requiring a right hemicolectomy and small bowel resection. Her abdomen was left open, and second look laparotomy revealed diffusely necrotic small and large bowel with only the ascending colon remaining viable. After a multidisciplinary discussion, this was deemed non-survivable and the patient's care was transitioned to comfort only, and she subsequently passed. Recognition of the significant risks of endovascular repair of shaggy aortic disease is extremely important, and care must be taken to properly plan for the associated high-risk complications.

Figure 1: CT angiogram images depicting the tortuosity of the thoracic aorta (left), as well as the extensive mural thrombus (right).

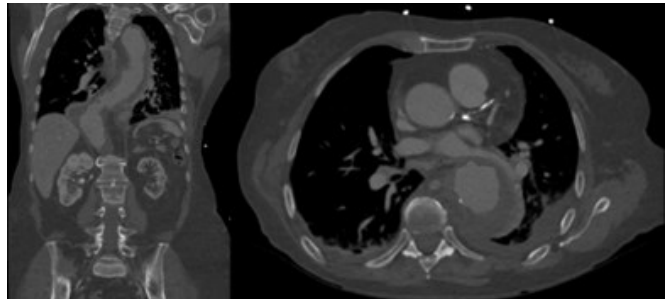
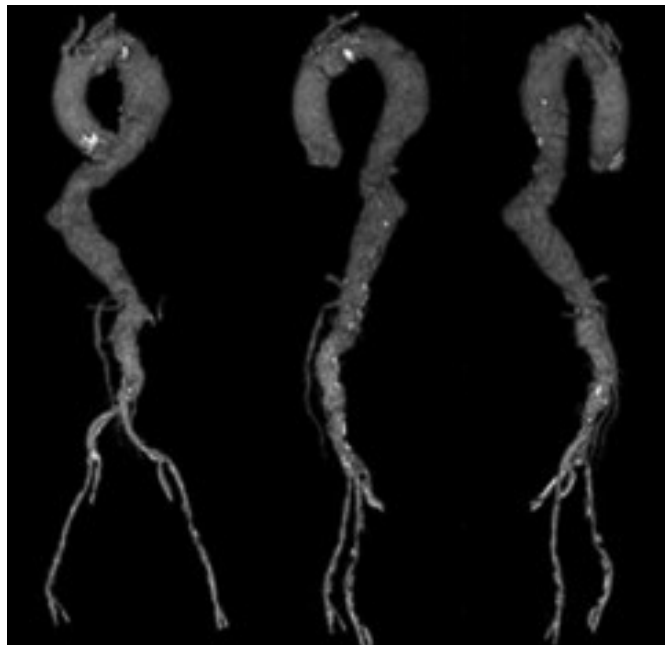


Figure 2: 3D rendering of the patient's aortic anatomy, demonstrating the complex tortuosity.



9:45 am § (Fellows Case Presentation 10)

Endovascular Management of Traumatic Aortoiliac Rupture with Acute Limb Ischemia

Hanaa Aridi, MD, Indiana University Health, Indianapolis, IN

INTRODUCTION: Blunt traumatic aortic rupture represents less than 5% of traumatic injuries of the aorta and is associated with extremely high mortality. Literature about endovascular treatment in blunt trauma of the abdominal aorta is scarce secondary to its low incidence and the low percentage of patients who survive. We report the novel use of available endovascular technology for treating a life and limb threatening complex injury.

SETTING: Level 1 Trauma Center, Indiana University Methodist Hospital, Indianapolis, IN

CASE DESCRIPTION: 38-year-old male with no significant past medical history presented following a motor vehicle collision rollover with intraabdominal trauma, pelvic and spine fractures, and severe distal aortic injury with acute right lower extremity ischemia. The patient was intubated en route to the hospital. On arrival, it was not possible to assess motor and sensory functions, however, no signals were appreciable in the patient's right lower extremity.

After primary survey and imaging, the patient was found to have severe distal aortic injury consistent with complete intimal dissection and right common iliac artery (CIA) occlusion. The aorta had a diameter of 15-17 mm and the iliac arteries were approximately 8 mm (Figure 1). The patient also had significant concomitant intraabdominal injuries including splenic (grade 1) and right renal (grade IV) injuries, sigmoid colon perforation, small bowel serosal injuries, and traumatic abdominal wall hernia due to ruptured rectus abdominis.

He was taken to the operating room emergently for a combined vascular and trauma surgery procedures. The right common femoral artery (CFA) was accessed via right groin cutdown while percutaneous access of the left CFA was performed under ultrasound guidance. Intraoperative angiography showed delamination of the intima and retrograde dissection to the mid infrarenal abdominal aorta with acute thrombus in the left CIA and dissection with complete occlusion of the R. CIA. Large caliber sheath was placed from right femoral artery access and required Fem-Fem body floss technique. Intravascular ultrasound (IVUS) was used to verify true lumen access and subsequent graft placement (Figure 2). A 23 mm x 10 mm x 10 cm iliac branch endoprosthesis (IBD) was placed and further extended into the right common iliac artery using an 8 mm x 7.9 mm covered stent which was post dilated within the IBD with a

10 mm balloon. To facilitate the cannulation of the contralateral gate from the left, we needed additional snaring of the wire advanced from the ipsilateral limb. Two 8 mm x 79 mm covered stents were extended to the level of the left hypogastric artery. Stent Junctions were dilated with a kissing balloon technique. Completion imaging showed a widely patent aorta with brisk filling of the bilateral renal arteries, the bilateral external iliac and hypogastric arteries (Figure 3). Patient needed 4 compartment fasciotomy. The trauma team then performed an exploratory laparotomy with bowel resection and temporary abdominal closure. Patient had a denuded aortic wall with stent graft visualized through the thin aortic wall (Figure 4). Patient was taken back to the OR on POD#1 for further bowel resection and anastomosis and abdominal wall closure. The patient was extubated on POD#3 and continue to successfully recover until he was discharged on POD#12 on low-dose aspirin. Follow up CT Imaging at 3 months showed patency of the aortic stent graft with normal lower extremity doppler studies (Fig 5)

CONCLUSION: Endovascular treatment for blunt abdominal aortic injury is less invasive and associated with less morbidity and mortality. It should be considered as first-line treatment in patients with injuries where anatomy is suitable. This case demonstrates the successful use of Iliac branch graft device, although not per IFU, for endovascular reconstruction of the aortoiliac arteries in the trauma setting.

Figure 1. Preoperative CTA findings

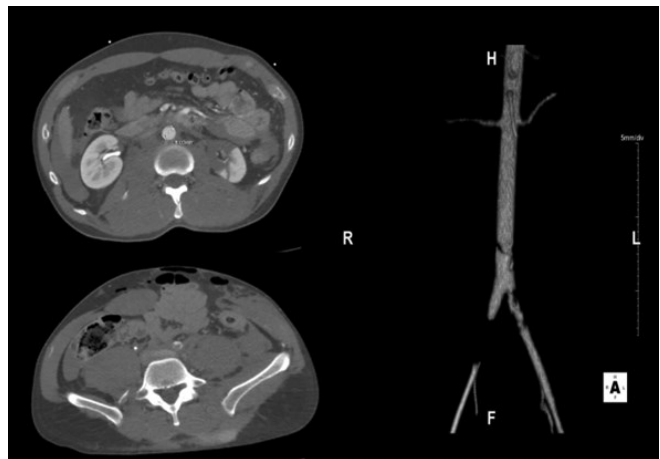


Figure 2. Intra Operative Intravascular Ultrasonography

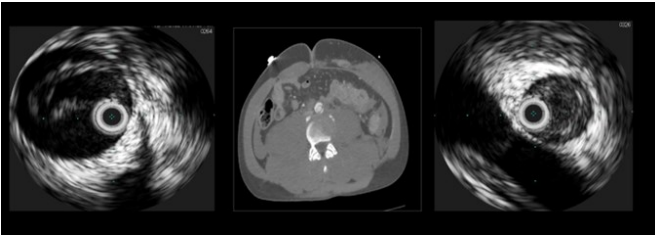


Figure 3. Completion angiography

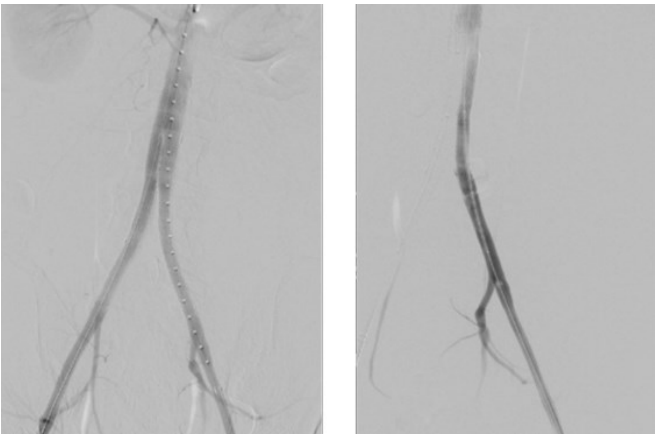


Figure 4. Intraoperative Aortic Exposure



Figure 5. Follow up CTA



10:45 am § (Fellows Case Presentation 11)
**Innominate Artery Coverage during
 TEVAR after Aortic Debranching**
 Paul Haddad, MD, Houston Methodist
 Hospital, Houston, TX

BACKGROUND: Aortic arch debranching and thoracic endovascular aortic repair (TEVAR) is a common method used to perform endovascular repair of an aortic arch aneurysm. Once debranching has occurred, the patient often relies on a single branch to perfuse the brain and upper extremities. During TEVAR, the deployment of the stent graft can risk coverage of this single remaining branch and be a significant source of morbidity and mortality.

INTRODUCTION: We describe a patient who underwent TEVAR after aortic arch debranching where the stent graft was inadvertently deployed more proximal than the intended landing zone, causing the right innominate artery

to become covered. We will describe the endovascular method used during this case in an attempt to correct this error.

CASE DESCRIPTION: This is a 44-year-old male who presented with two-day history of chest pain, back pain, nausea, and vomiting. His past medical history includes hepatitis C, hypertension, chronic congestive heart failure, cardiac pacemaker, chronic kidney disease stage 2, smoking, and cocaine abuse. CT angiogram was obtained which revealed a 7 cm distal aortic arch aneurysm. The decision was made to perform TEVAR in order to treat the aortic arch aneurysm since he was too high risk for open aortic arch reconstruction. In order to properly land the stent graft in healthy aorta, the graft would need to be deployed in zone 1, which would cover both the left common carotid artery as well as the left subclavian artery. Aortic debranching was then performed successfully using a carotid-carotid-subclavian bypass. On postoperative day 2, the patient was taken to the operating room for TEVAR where a Gore TAG 45 mm x 45 mm x 20 cm endograft was used. During deployment of the stent-graft, the stent migrated proximally over the innominate artery causing a hemodynamically significant coverage of its origin. There was noted to be significant loss of cerebral perfusion on transcranial doppler (TCD) and loss of invasive blood pressure monitoring from the radial arterial line. Figure 1 shows normal TCD waveforms bilaterally prior to graft deployment, followed by Figure 2 which shows significant change in the waveform bilaterally after deployment. An aortic balloon was then advanced to the proximal stent-graft and inflated at the level of aneurysm in order to shorten the stent-graft with some improvement in completion angiogram. In addition, in order to completely uncover the innominate artery, gentle tensioned was applied caudally which helped pull the graft away from the innominate origin. Completion angiogram revealed normal flow into the innominate artery. Figure 3 shows significant improvement in the TCD waveform. No dissection was noted on transesophageal echocardiogram and the patient recovered fully with resolution of his chest and back pain.

CONCLUSION: Stent-graft deployment during aortic aneurysm repair can inadvertently cover major aortic branches causing severe morbidity and mortality. The coverage of the innominate artery during TEVAR after aortic debranching is a serious complication and so the maneuver presented here is crucial in its correction. Further development and education regarding bail out maneuvers such as this are important in the use of endovascular aortic repair.

Figure 1.

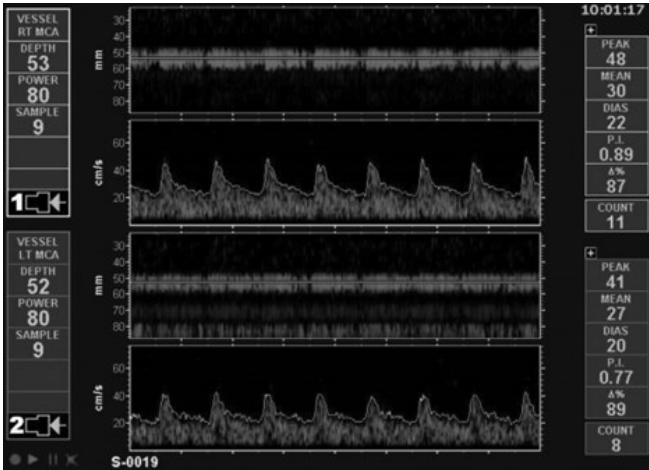


Figure 2.

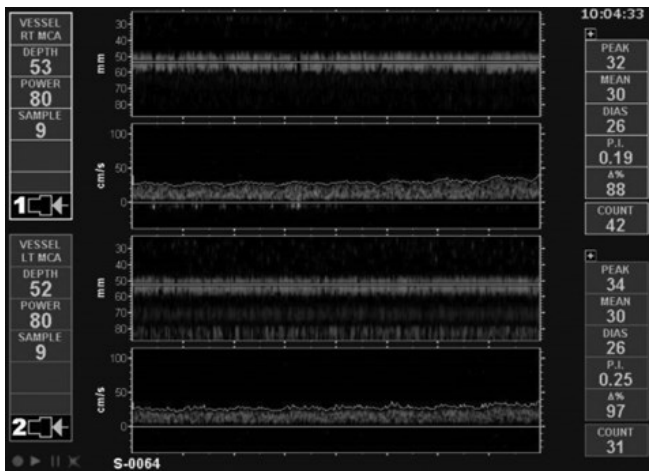
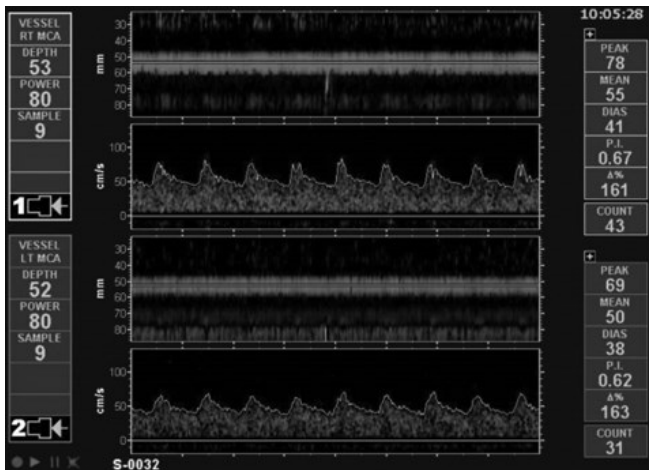


Figure 3.



11:15 am § (Fellows Case Presentation 12)
Thoracic Endovascular Aortic Repair for Descending Thoracic Aortic Aneurysm with Endovascular and Open Repair of Access Related Complications
 Jake Forman, DO, Florida Atlantic University Charles E. Schmidt College of Medicine, Boca Raton, FL

INTRODUCTION: We present the case of an electively performed thoracic endovascular aortic repair (TEVAR) for a 6.5cm descending thoracic aortic aneurysm and subsequent access related complications requiring open and endovascular repair.

CASE PRESENTATION: This is an 82-year-old female with past medical history significant for diabetes mellitus type 2, Graves’ disease, rheumatoid arthritis and previously treated breast cancer referred to our practice with the finding of a 6.5 cm descending thoracic aortic aneurysm just distal to the left subclavian artery (SCA) takeoff. Due to the proximity of the aneurysm to the left SCA, we planned a staged approach with left carotid to subclavian bypass followed by TEVAR. The patient underwent left carotid to subclavian artery bypass without complication. Once the patient recovered from her bypass, she presented electively for a TEVAR with intentional coverage of the left SCA and embolization of the left SCA using an Amplatzer™ plug device.

A prophylactic spinal drain was placed preoperatively due to planned coverage of greater than 200cm of thoracic aorta. Bilateral common femoral artery (CFA) access was obtained in the standard fashion using 5 French sheaths. The left CFA was chosen as the site of delivery for the thoracic endograft. The “preclose” technique was performed and the sheath size upgraded to 23 French in order to accommodate the graft. The graft was delivered through the left iliac artery where some tension was encountered. A 36 x 200 mm graft was delivered in the aortic arch covering the left SCA. We extended the thoracic graft using a 44 x 200 mm graft for adequate aneurysmal coverage down to the celiac artery. When removing the 23-French sheath, the patient experienced some hypotension. An aortoiliac angiogram demonstrated extravasation from the distal common and proximal external iliac arteries. Covered balloon expandable stents were deployed in the left common and external iliac arteries with cessation of extravasation. At this point, we deployed a 10mm Amplatzer™ plug via a left brachial approach proximal to left vertebral artery which remained intact. The previously deployed Perclose devices for the left CFA were secured but hemostasis was not achieved at which time the decision was made to perform a left femoral cutdown.

After further inspection of the left external iliac artery, the previously placed stent was exposed and the left external iliac artery appeared completely obliterated. Therefore, we placed a Coda® balloon up into the left common iliac artery and inflated it for proximal control and performed an interposition bypass graft from the distal end of the stent to the femoral bifurcation with an 8-mm interposition graft using a fusion Dacron/PTFE graft.

There were no Doppler signals in the left foot with restoration of blood flow and on further inspection, the left external iliac artery stent proximal to the bypass graft appeared thrombosed secondary to clamp placement during repair. Therefore, the right CFA was re-accessed. We then performed percutaneous mechanical thrombectomy followed by balloon angioplasty of the left common and external iliac stents. Completion angiography demonstrated the stents to be widely patent. The iliofemoral interposition bypass graft remained patent with 3 vessel runoff to the left foot.

CONCLUSION: Preoperative inspection of vascular access for graft delivery cannot be overemphasized. In the event of iliac rupture during TEVAR, covered balloon expandable stents are an expeditious and safe bailout. For unexpected breakdown of the CFA used for percutaneous access, an interposition graft can be used for repair. When a balloon expandable stent serves as the proximal location for an interposition graft, a traditional vascular clamp cannot be used for proximal control and balloon tamponade provides an alternative method for control.

11:45 pm § *(Fellows Case Presentation 13)*
Transaortic Hybrid Repair of a Type III Thoracoabdominal Aortic Aneurysm in Takayasu's Arteritis
 David Blitzer, MD, University of Maryland Medical Center, Baltimore, MD

Takayasu's arteritis (TA) is described as a panarteritis that can result in significant vascular sequelae. With a preference for the aorta and its branches, TA has been referred to as "pulseless disease" in cases of stenotic or occlusive lesions of both upper and lower extremities; but can alternatively result in aneurysmal degeneration. The following case was a challenging presentation that included concomitant occlusive and aneurysmal aortic pathology. The rapidly expanding Type III thoracoabdominal aortic aneurysm (TAAA-III) involved the superior mesenteric artery (SMA) and left renal artery (LRA), perfusing to the sole functioning kidney, had increased 12mm over the last year to 5.5cm in its largest dimension. The patient had previously undergone

multiple open repairs through her chest, first for an aortic hemiarch replacement and later for repair of a descending thoracic aortic aneurysm. Additionally, the infrarenal aorta was chronically occluded and lower extremity perfusion was dependent on her previous axillary bifemoral bypass. Because of these factors, we planned to repair her TAAA-III through a hybrid approach. We proceeded with open exposure of the occluded infrarenal aorta through a midline laparotomy incision, and the right axillary artery through an infraclavicular cutdown. A body flossing system was established after accessing the occluded intrarenal aorta using a Seldinger approach, and snaring the wire once in the descending thoracic aorta from the right axillary artery. We then introduced a 32mm Gore Excluder endograft from the transabdominal access, building a combination of self-expanding and balloon expandable stent-grafts into the SMA, and deploying the ipsilateral limb into the LRA. Completion angiography demonstrated exclusion of the aneurysm sac with good perfusion to the SMA and LRA. This case highlights one approach to repair a TAAA when access is extremely limited. TA is already a rare disease with scarce reports in the literature, and therefore technical considerations and pre-operative planning are paramount to successful repair.

1:15 pm § *(Fellows Case Presentation 14)*
Endovascular Arch Repair of Chronic Residual Type A Aortic Dissection with Dual Branch Stent Graft
 Domingo Uceda, MD, University of Pennsylvania Health System, Philadelphia, PA

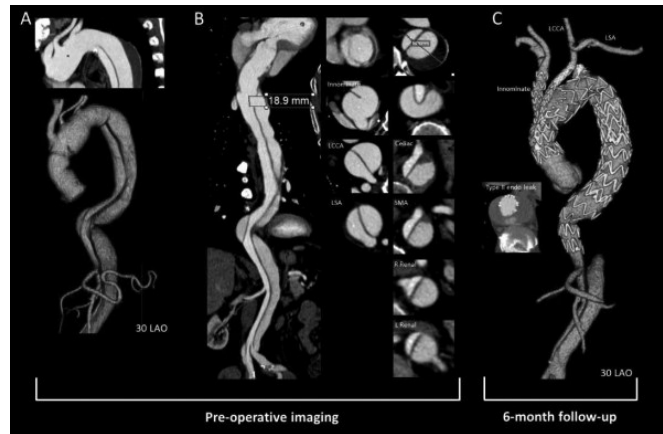
The patient was a 72-year-old male with a history of previous ascending aortic replacement (with hemiarch replacement, 34 mm Dacron graft) back in September of 2019 for an acute type A dissection. Two years later, he was found to have an enlarging arch and descending thoracic aortic aneurysm. The residual dissection primary entry tear was larger >1 cm, on the lesser curve of the proximal ascending aorta (Zone 0), spared the great vessels and extended down into the abdominal aorta and bilateral common iliac arteries, with only his left renal artery coming off the false lumen (Figure 1A, B). The patient was high risk for open surgery and an informed decision was made to undergo a staged endovascular repair. The approach began with left subclavian artery (LSA) debranching via a left common carotid to subclavian artery (LCCA-LSA) bypass followed by Zone 0 landing of a Relay Dual Branch TEVAR (Terumo Aortic, Sunrise, FL) as part of the US Early Feasibility Study Clinical Trial, which included 2 inner

branches for innominate and LCCA, and later a staged TEVAR extension to the level of the diaphragm.

The case was performed by first positioning a temporary transvenous pacer into the right ventricle via right femoral vein access for rapid pacing during graft deployment. Cutdowns were done on bilateral common carotid arteries for retrograde stent extension into the brachiocephalic trunk (BCT) and LCCA, and the Dual Branch TEVAR (44 x 36 x 270 mm) was positioned via right femoral access in the aortic arch. Immediately after stent-graft deployment, bilateral radial arterial line waveforms became dampened, there was loss of transcranial doppler signals and no carotid pulse bilaterally, concerning for coverage of the arch vessels. Expedient access to the LCCA was obtained. The L CCA limb was advanced into the main body device and deployed with immediate return of equal blood pressure tracings from radial arterial lines bilaterally and improvement in transcranial doppler signals. The BCT limb was deployed similarly and uneventfully and the LSA was coiled via left brachial access. Post-operative MRI showed small acute infarcts in the bilateral cerebellar hemispheres, right thalamus, and bilateral frontal, occipital, and parietal lobes. The patient had no focal neurological findings on examination and recovered well with immediate post-operative imaging showing persistent filling of the false lumen and undifferentiated endoleak from LCCA limb. He was discharged home on the fourth post-operative day.

Two months later, the patient underwent planned extension of TEVAR and repair of undifferentiated endoleak from the LCCA limb. A tapered TEVAR (40 x 36 x 154 cm, 40 x 204 mm, Relay Pro NBS) (Terumo Aortic, Sunrise, FL) was positioned via left femoral access and deployed into the main body of the Dual Branch graft and landed distally just above the level of celiac artery. Next, the LCCA limb was interrogated via left brachial access revealing type Ib endoleak which was resolved with distal limb extension with a covered stent. He was discharged home and has resumed an active lifestyle. Imaging at 6 months demonstrated decreasing size of the descending thoracic aorta and residual dissection with a partially thrombosed false lumen and type II endoleak from a lumbar vessel in the distal descending aorta (Figure 1C).

Figure 1: Pre-operative and post-operative CT angiography imaging.



1:45 pm § (Fellows Case Presentation 15)
The Irony of it All: TEVAR Induced Aneurysm
 Jennifer Perri, MD, Duke University
 Medical Center, Durham, NC

A 72-year-old female former smoker with hypertension and hyperlipidemia, was diagnosed with a thoracic aortic aneurysm based on imaging performed for a COPD exacerbation. Pre op CTA revealed multiple penetrating aortic ulcers (PAU) (Fig. 1A). The patient underwent TEVAR with Zenith Alpha proximal device (Cook Medical) 30x155mm, placed in the descending aorta. 16-month CTA showed loss of seal (type 1A and 1B endoleaks) and new dilation proximal and distal to the Zenith device (6.2 cm proximal, 4.7 cm distal) (Fig. 1B).

Dilation of pre-existing disease is a possible etiology of the aneurysms, however it is likely stent graft induced aortic wall injury (SAWI) played a role. Hughes et al report their experience with 430 patients undergoing TEVAR at Duke Medical Center; 9% developed aortic injury, 1/3 of those required further intervention, devices with bare metal barbs had higher incidence of aortic injury.

In this case, the patient was taken back to the operating room 6 months after her index operation. Due to severe iliofemoral calcific disease, the only option for device delivery was via the ascending aorta. The patient underwent a hemi-sternotomy; a 10x60mm Dacron graft was anastomosed to the ascending aorta, and then taken through the right chest for straight line access to the aorta. A 40mm x 100mm Gore CTAG active control device was

deployed distally above the celiac artery and 34 x 20mm Gore CTAG deployed proximally with partial coverage of the left subclavian. Trilobe balloon was used for post dilation. One month CTA showed reduction in diameter of the descending aorta, no endoleak, and no new PAU (Fig. 1C).

Although stent graft induced aortic wall injury is a rare complication following TEVAR, it must be addressed. Extension with a covered stent in the areas of injury offers a viable method of repair.

Figure 1A. Pre-Op — Penetrating aortic ulcers

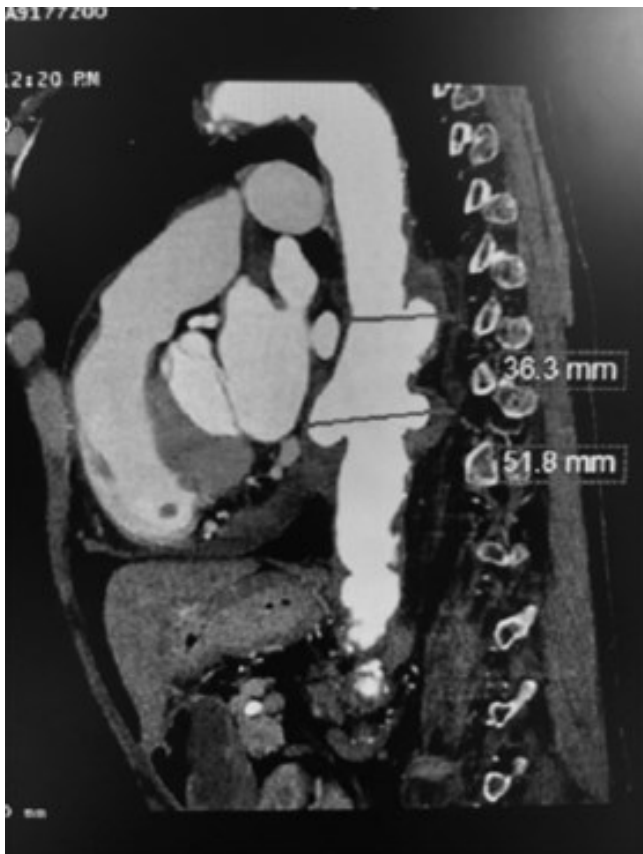


Figure 1B. Post-Op — Aortic injury proximal and distal to the Zenith device

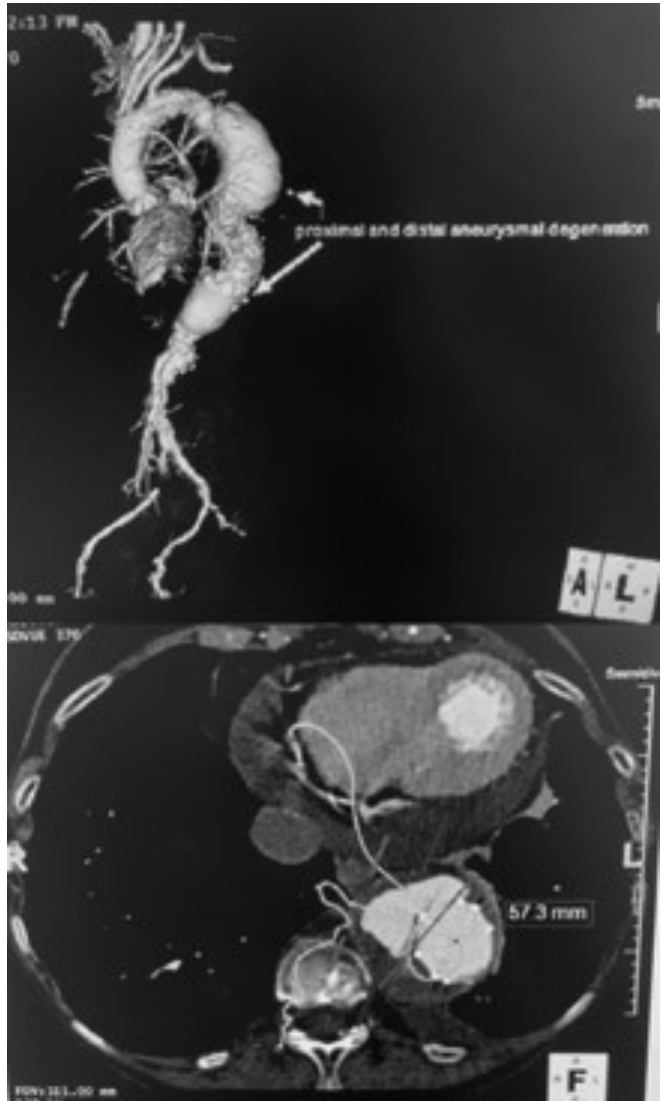


Figure 1C. Subsequent intervention — Extension with CTAG (no bare metal barbs), no aortic injury at 1 month



Upon arrival, patient was hemodynamically unstable, had blood cultures (positive for staph aureus), he was oxygen dependent, and had baseline creatinine of 2.3 mg/dl. He was started on IV antibiotics and underwent brachial access and 4-vessel chimney stent graft placement into the superior mesenteric artery, celiac artery, bilateral renal arteries, and coil embolization of the distal descending thoracic aorta and the aortic stump. Patient survived, and on postoperative day 3, was transferred out of the intensive care. Later that day, he developed left flank pain and hypotension. Recurrent aortic stump bleed was suspected, and he emergently underwent percutaneous access into the retroperitoneal hematoma. A catheter was directed across the retroperitoneal space up to the site of stump bleed. Gelfoam slurry was prepared on the back table and was used in combination with coils for embolization, which surprisingly thrombosed the bleeding stump. The patient recovered in the ICU over the next month.

2:30 pm § (Fellows Case Presentation 16)
**Ruptured Infected Aortic Stump – A
 Disaster Case**
 Mehdi Teymouri, MD, Vascular Health
 Partners, Latham, NY

This case presentation will highlight a stepwise approach with all hands on deck to a complex problem with no clear answers.

In 2001, a 58-year-old male with CAD, HTN, and COPD underwent open surgical repair for a 5.5cm AAA. In 2006, he presented to the emergency room with an aorto-enteric fistula, was hemodynamically unstable, and underwent emergent EVAR and survived. Three months later he underwent a planned staged complete stent graft explant and right axillary-bifemoral bypass. He did well for over a decade, until recently when he presented to an outside institution with a right brachial embolus, underwent brachial embolectomy, and subsequently developed an infection at the brachial incision site which was managed as outpatient for several months with oral antibiotics. Three months later he presented again to an outside institute with left flank and groin pain and underwent a CTA which indicated a ruptured juxtarenal aortic stump and was subsequently transferred to our institution.

And the nightmare begins...

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SCHEDULE-AT-A-GLANCE

WEDNESDAY, OCTOBER 12, 2022

TIME	EVENT	LOCATION
4:00 pm—6:30 pm	Registration	Ballroom Foyer

THURSDAY, OCTOBER 13, 2022

TIME	EVENT	LOCATION
6:30 am	Registration	Ballroom Foyer
7:00 am—7:45 am	Continental Breakfast	Salon A
7:50 am	Welcome & Introduction	Salon B
8:00 am—10:00 am	Scientific Session I	Salon B
10:00 am—10:30 am	Refreshments/Visit Exhibits	Salon A
10:30 am—12:30 pm	Scientific Session II	Salon B
12:30 pm—1:30 pm	Attendee Lunch	Salon C
12:30 pm—1:30 pm	Cook Fellows Lunch	Meeting Room 4
1:45 pm—3:15 pm	Scientific Session III	Salon B
3:30 pm—4:00 pm	Silk Road Fellows—Didactic	Salon B
4:00 pm—5:30 pm	Silk Road Fellows—Hands-On	Meeting Room 3
6:30 pm—7:30 pm	Welcome Reception	North Pool Deck
7:30 pm—9:30 pm	Faculty Dinner (<i>By Invitation</i>)	Sunset Grill

FRIDAY, OCTOBER 14, 2022

TIME	EVENT	LOCATION
7:00 am	Registration	Ballroom Foyer
7:00 am—8:00 am	Inari Fellows Breakfast	Meeting Room 4
7:30 am—8:00 am	Continental Breakfast/Visit Exhibits	Salon A
8:00 am—9:30 am	Scientific Session IV	Salon B
9:30 am—10:00 am	Refreshments/Visit Exhibits	Salon A
10:00 am—12:00 pm	Scientific Session V	Salon B
12:00 pm—1:00 pm	Endologix Symposium/Box Luncheon	Salon B
1:15 pm—2:45 pm	Session VI	Salon B
3:00 pm—5:00 pm	Medtronic Fellows Program	Meeting Room 4
6:30 pm—10:00 pm	Beach Party	North Beach Isle

SATURDAY, OCTOBER 15, 2022

TIME	EVENT	LOCATION
8:00 am	Registration	Ballroom Foyer
8:00 am—8:30 am	Continental Breakfast/Visit Exhibits	Salon A
8:30 am—10:00 am	Scientific Session VII	Salon B
10:00 am—10:15 am	Refreshments/Visit Exhibits	Salon A
10:15 am—11:15 am	Scientific Session VII (<i>continued</i>)	Salon B
11:15 am	Summit Adjourns	

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