Endovascular Management For Isolated Abdominal Aortic Dissection:

--When to treat invasively and when not; what to do if it involves the juxtarenal aorta: How dose treatment differ from that of AAAs

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No Disclosures

BACKGROUND

Isolated Abdominal Aortic Dissection (IAAD) is a rare event.

In the current series, **1.3%** of all the International Registry of Acute Aortic Dissection (IRAD) enrolled patients were identified as having an IAAD.

BACKGROUND

Characteristics of IAADs

A Review and Meta-Analysis of 92 Patients

Dissection length, mm	51.8±25.9
Dissection type	
Spontaneous	73 (79%)
Traumatic	13 (14%)
Iatrogenic	6 (7%)
Retrograde extent	
Isolated AAD	88 (95.7%)
Thoracic extension	4 (4.3%)
Proximal extent (n=66)	
Above celiac axis	7 (10.6%)
Between celiac axis and renal arteries	23 (35%)
Between renal arteries and IMA	33 (50%)
Between IMA and aortic bifurcation	3 (4.5%)
Distal extent (n=65)	
Above IMA	11 (17%)
Between IMA and aortic bifurcation	13 (20%)
CIA	33 (51%)
Below CIA	8 (12%)
Involvement	
SMA	4 (4.3%)
Renal artery	4 (4.3%)
IMA	2 (2.2%)
Aortic rupture	9 (9.8%)

Frederik H. W. et al, J Endovasc Ther. 2009;16:71-80

BACKGROUND

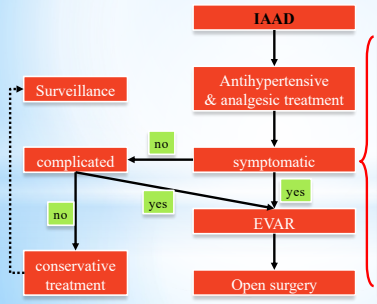
Suggested indications of endovascular/surgical treatment for IAAD

- signs of aortic **rupture**
- visceral, renal, or limb **ischemia**
- **persistent or recurrent** abdominal pain or low backache not relieved by observation treatment excluding other diseases
- aortic diameter **>3 cm**, **rapid growth ≥10mm/year**
- preparation for other intraperitoneal or lumbar procedures
- suprarenal IAAD

Qianqian Zhu, et al. J Vasc Surg. 2015; Wang T; Chang S, et al. J Endovasc Ther. 2022; Liu Y, et al. Eur J Vasc Endovasc Surg. 2020; Liu Y, et al. Eur J Vasc Endovasc Surg. 2020

BACKGROUND

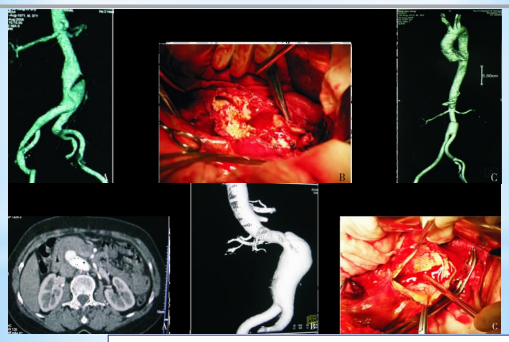
Flow diagram of treatment strategy



Indication for Endo/OS

- signs of aortic rupture
- visceral, renal, or limb ischemia
- persistent or recurrent abdominal pain or low backache not relieved by observation treatment excluding other diseases
- aortic diameter >3 cm, rapid growth ≥10mm/year
- preparation for other intraperitoneal or lumbar procedures
- suprarenal IAAD

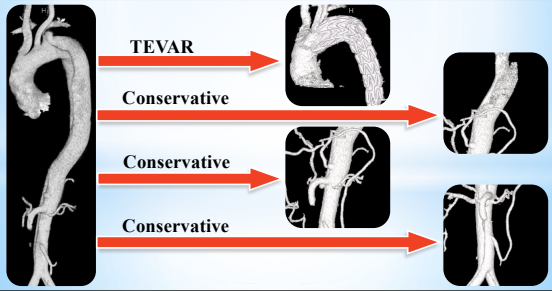
OPEN SURGERY



C. Shu, et al. Diagnosis and treatment of the Isolated dissection of the infrarenal abdominal aorta. Chinese Journal of General Surgery. 2010

CLINICAL MATERIAL IN OUR DEPARTMENT

Jul 2011 - Sept 2024
3746 patients of AD were treated with TEVAR，135 were IAAD



THE EXPERIENCE OF OUR CENTER

From January 2011 to June 2016, there were **154 (4.1%)** IAAD patients among **3746** patients enrolled by aortic dissection.
Among them, **109** patients underwent endovascular treatment.

- **109** IAADs received endo-treatment
  - **11** supraceliac → **11** single tube stent
  - **8** paravisceral → **3** chimney technique; **5** multilayer bare stents
  - **90** infrarenal → **84** bifurcated stent-graft; **6** single tube stent

Endovascular strategies vary among different types of IAAD !

OUTCOMES OF ENDOVASCULAR TREATMENT

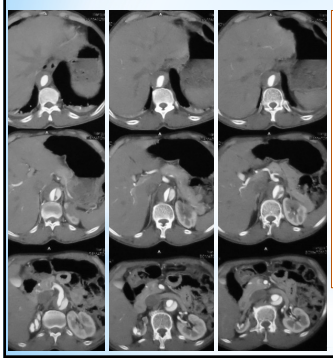
109 IAAD cases from 2011 to 2016
11 supraceliac, 8 paravisceral, and 90 infrarenal IAADs

Primary technical success was 100%.
Reintervention in 3(2.8%) .
Type II endoleak in 5 (4.6%).
Overall 30-day mortality was 0%.

Patients(11 of 109) complicated with infrarenal AAA showed significantly decreases in aneurysm size after endovascular repair.

Endovascular treatment is feasible, safe and effective for treatment of IAAD, and strategies should be tailored according to the individual aortic anatomy.

CASE 1 --supraceliac

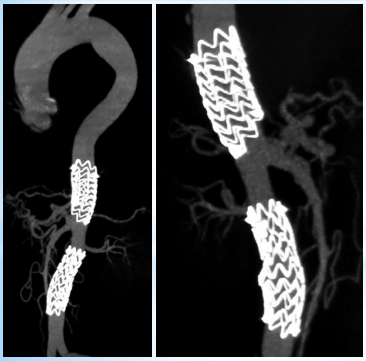


The patient, male, 61 years old, suffered from severe stomachache for 6 days.

CTA indicated an aortic dissection. The false lumen in descending aorta was filled with thrombus. The primary entry tear was close to visceral arteries.

- How can we do?
- Open surgery?
- Hybrid technique?
- Endo-tech?

CASE 1 --supraceliac



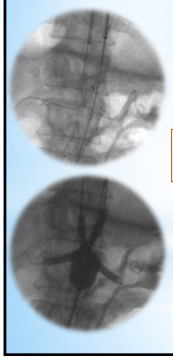
The site of entry tear should be located and covered with stent-grafts accurately.

After operation, all of descending and abdominal aorta recovered without any lesion.

CASE 2--paravisceral

The patient, male, 48 years old, suffered from IAAD.
The primary entry tear was close to the right renal artery.

CASE 2--paravisceral



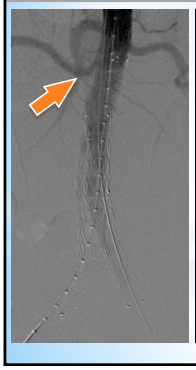
EVAR+
double chimney renal stent

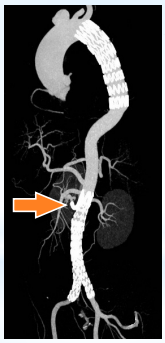
CASE 3--paravisceral

55 years old male patient, suffered from right low back pain for 2 days. Performed TEVAR 5 years ago.

CTA indicated an IAAD. The primary entry tear was close to the right renal artery.

CASE 3--paravisceral



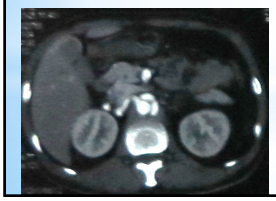


EVAR + Chimney right renal artery stent
(Medtronic + Viabahn)

CASE 4-- paravisceral

Male, 49 years old, suffered from suffered from abrupt back pain and stomachache.

Emergent CTA indicated multiple thoracic PAU and IAAD, visceral aortic segment was invaded by the lesions.

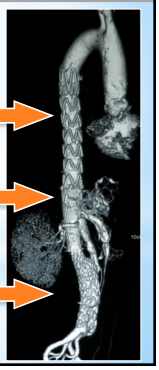


CASE 4-- paravisceral

TEVAR for multiple descending aortic ulcers

2 bare stents for the aortic ulcers invaded visceral arteries

1 straight stent-graft plus 2 iliac stent-grafts (kissing technique) for abdominal aortic dissection

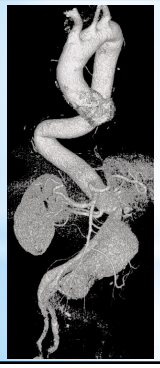


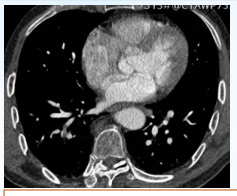
CASE 5-- inferrenal

58 years old female patient,, suffered from abdominal pain and abdominal distension for 1 week.

CTA indicated an IAAD involved left iliac artery.

CASE 6--inferrenal





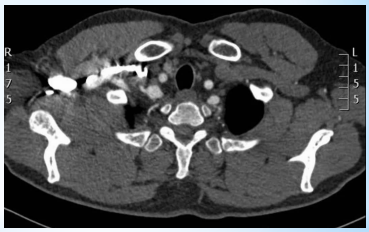
Male, 62 years old
suffered from severe back pain for 1 month.
With conservative treatment for 3 weeks in other hospital, the symptom released. However, CT indicated a isolated abdominal aortic dissection.

CASE 6--inferrenal

CASE 6--inferrenal

After bifurcated stent-graft has been deployed, the dissected aorta remodeled well without any stenosis.

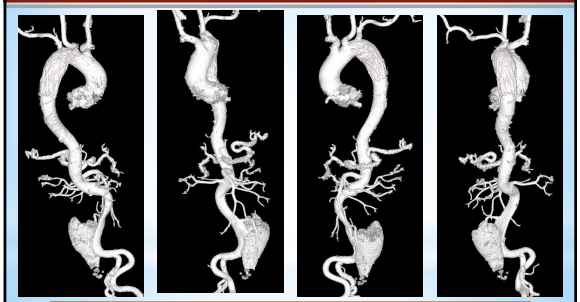
CASE 7—post TEVAR



6 years before, the patient suffered from acute TBAD when he was 35y. TEVAR was performed to seal dissection in thoracic aorta.

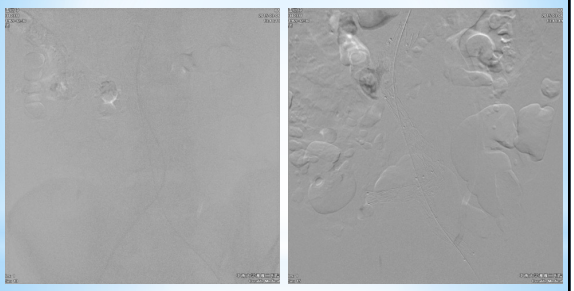
6 years later, the patient felt abdominal pain.
The false lumen in descending aorta recovered completely. However, there was a huge abdominal aortic dissected aneurysm.

CASE 7—post TEVAR

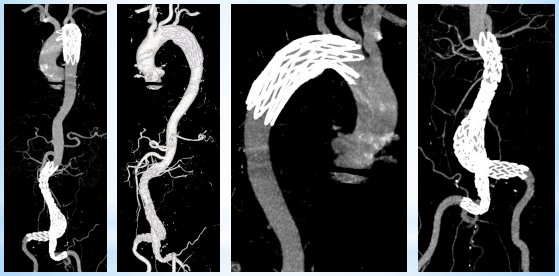


The abdominal aortic dissected aneurysm can be treated with endovascular technique now.

CASE 7—post TEVAR

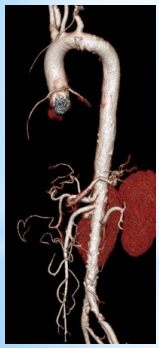


CASE 7—post TEVAR



Endovascular radical therapy for aortic dissection was achieved!

CASE 8—TEVAR+EVAR

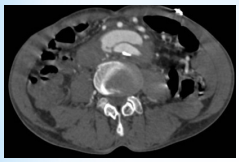


55 years old male patient,, suffered from chest and abdominal pain for 2 days.
CTA indicated an thoracic aortic ulcer and **abdominal aortic dissection**.

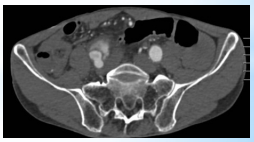
TEVAR+EVAR
(Medtronic Valiant thoracic stent+ Medtronic Endurant stent)

TEVAR+EVAR simutaneously, no postoperative paraplegia.

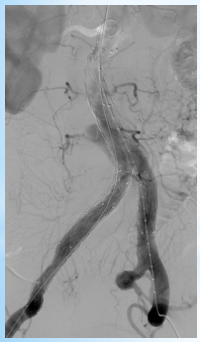
CASE 9--Endoleak



58 years old female patient, suffered from severe abdominal pain for 4 days.
CTA indicated IAAD.



CASE 8—TEVAR+EVAR



EVAR performed, DSA shows endoleak, 3 months later, endoleak disappear.

CASE 10--Ruptured

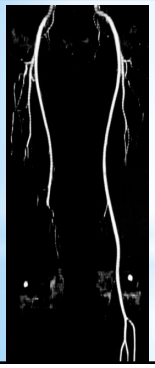
58 years old male patient, suffered from severe traffic accidence.
CT indicated an isolated abdominal aortic dissection and retroperitoneal hematoma.
The vital signs of the patient were unstable.

Emergent EVAR was performed.

CASE 10--Ruptured

After emergent EVAR to repair the ruptured abdominal aortic dissection, the patient recovered well.

CASE 11--Ruptured+ Aorta-enteric fistula

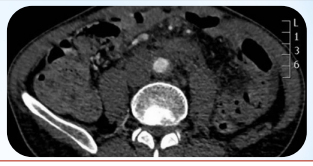


The patient, male, 49 years old, had syphilis, suffered from acute right lower extremity pain and received catheter thrombolysis treatment in another hospital 1 month before.

After operation, there was mild ache on the right low abdomen, which aggravated recently.

CTA indicated a right **iliac artery dissection** and left common femoral artery pseudo-aneurysm.

CASE 11--Ruptured+ Aorta-enteric fistula

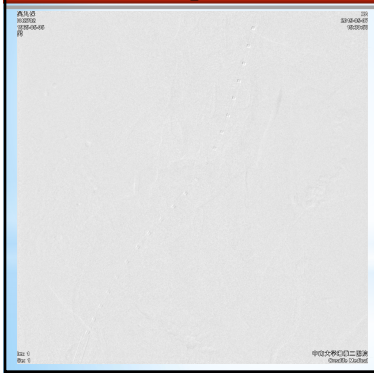


The patient had severe and aggravating pain after admission. Because of unclear etiology, conservative treatment was used first.

However, 4 days later, the severe pain released suddenly, then had extremely **severe hematochezia** and **hemorrhagic shock**.

Emergent CTA indicated an aggravated iliac artery lesion (3.3mm to 5.6mm) and **aorta-enteric fistula**.

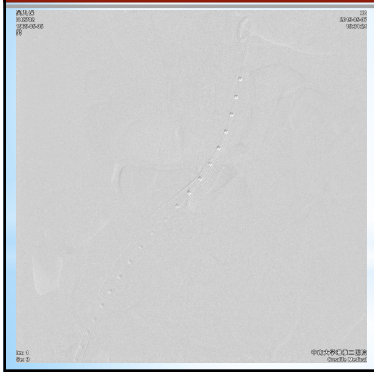
CASE 11--Ruptured+ Aorta-enteric fistula



The hemorrhagic shock was caused by iliac-digestive tract fistula definitely.

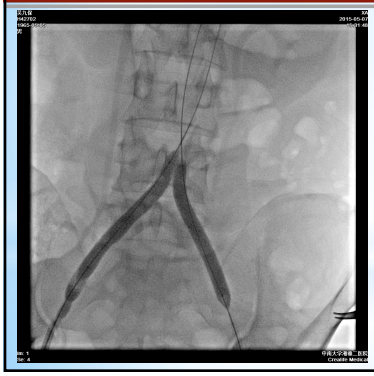
Endovascular treatment was performed immediately. Angiography indicated an aggravated iliac artery lesion.

CASE 11--Ruptured+ Aorta-enteric fistula



A VIABAHN stent-graft was inserted into the right common iliac artery and deployed immediately.

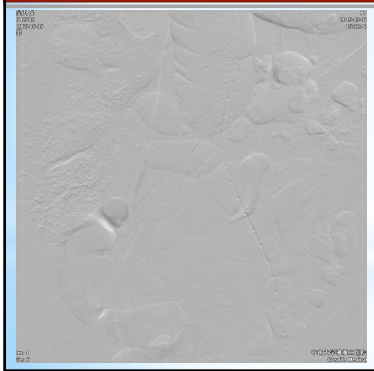
CASE 11--Ruptured+ Aorta-enteric fistula



Because the blood supply of the left iliac artery was invaded, a bare stent was deployed in the left common iliac artery with **kissing technique**.

Kissing angioplasty was performed then.

CASE 11--Ruptured+ Aorta-enteric fistula



The pseudoaneurysm of left common femoral artery was resected then.

After operation, the ruptured iliac artery was covered completely without endoleak.

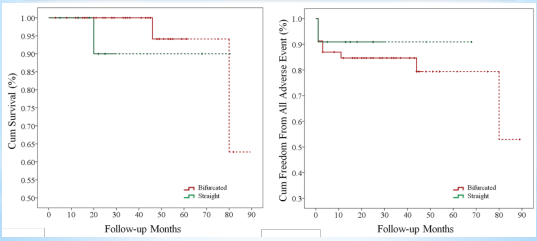
CASE 11--Ruptured+ Aorta-enteric fistula

1 year later, in follow-up CTA examination, the patient recovered well, without any complication.

The **kissing stent-grafts** are patent.

CONCLUSIONS

Survival and freedom from adverse events in IAAD



Cumulative survival

Cum freedom from all adverse event

Wang T; Chang S, et al. J Endovasc Ther. 2022

CONCLUSIONS

- IAAD is a rare condition that presents with significant clinical variability.
- Early prophylactic interventions are concerned about the risk of aortic rupture, visceral ischemia, or leg ischemia.
- Endovascular treatment of IAAD is an effective therapeutic approach with satisfactory results:
  - Chimney technique
  - Branched stent-graft
  - Fenestration stent-graft
  - Kissing stents

Thank you very much !

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