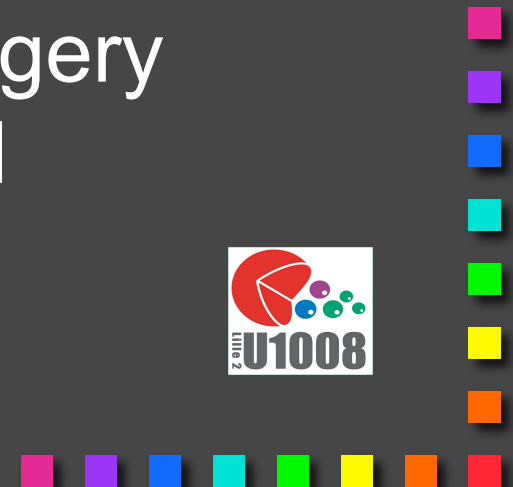


RUPTURED THORACOABDOMINAL AORTIC ANEURYSMS

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Department of Vascular Surgery
Nice University Hospital





MEET 2014
MULTIDISCIPLINARY EUROPEAN
ENDOVASCULAR THERAPY

BUILDING
ENDOVASCULAR
SYNERGIES

Faculty disclosure

Elixene- JEAN-BAPTISTE

**Proctoring of fenestrated and branched
procedures for Cook Europe®.**

INTRODUCTION (1)

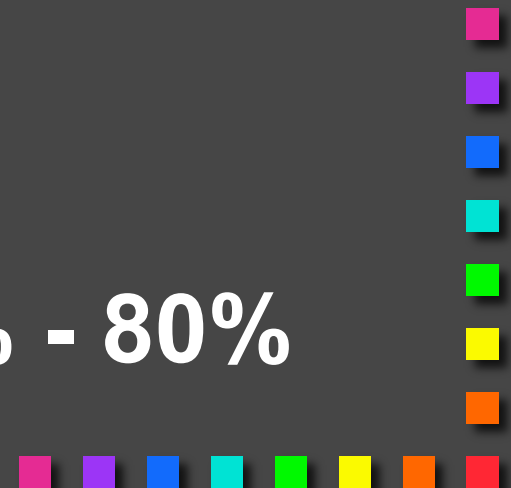
□ RUPTURED TAAA

□ Conservative treatment

✧ 100% fatal

□ Open surgical repair

✧ In-hospital mortality: 40% - 80%



INTRODUCTION (2)

- ❑ OSR in the urgent or emergency setting

- ❑ Selection bias

- ✧ Fittest patients considered at low or moderate risk for surgery

- ✧ Many high-risk patients with significant co-morbidities were just denied OSR



STOCKOLM COUNTY REGISTRY

Ruptured thoracic aortic aneurysms: A study of incidence and mortality rates

Gunnar Johansson, MD, PhD, Ulf Markström, MD,* and
Jesper Swedenborg, MD, PhD, Stockholm, Sweden

Pur ☐ Year 1980 & year 1989

rup ☐ 65 rTAAA

Met ☐ 41% reached the hospital alive

Sw ☐ Only 2 cases were surgically treated

SCOTTISH NATIONAL TAAA SERVICE

Eur J Vasc Endovasc Surg (2010) 39, 266–270



Natural History of Thoraco-abdominal Aneurysm in High-Risk Patients[☆]

P.A. Hansen^a, J.M.J. Richards^{a,*}, A.L. Tambyraja, L.R. Khan, R.T.A. Chalmers

Edinburgh Vascular Surgical Service, Clinical & Surgical Sciences (Surgery), University of Edinburgh, Scotland, UK

Submitted: 16 September 2009; accepted: 19 December 2009
Available online: 13 January 2010

KEYWORDS
Natural history;
Thoraco-abdominal
aortic aneurysm;
Outcome

Abstract. *Introduction:* There is considerable interest in the role of novel endovascular techniques for the treatment of patients with complex aneurysms who are unsuitable for standard interventions. Knowledge of the natural history of these lesions, as well as other co-morbidities, is required in order that these techniques may be applied correctly in this high-risk group.

Method: This study reviews the outcome of patients deemed to be unfit for surgery following assessment under the Scottish National Thoraco-abdominal aneurysm service (TAAA) service (2002–2008).

Results: Of 216 patients assessed, 89 (41%) patients were considered to be unfit for intervention. The median (interquartile range, IQR) age of patients was 75 (70–80) years and there were 39 men (44%). Median (IQR) aneurysm size was 6 (5.6–7.0) cm. The median (IQR) follow-up time was 12 (7–26) months. There were 49 (55%) deaths during the follow-up period of which 23 (47%) cases were due to ruptured TAAA and 26 (53%) were not aneurysm-related. Comparing patients with aneurysms <6 cm (33 patients) with those aneurysms ≥6 cm (56 patients) there was no difference in aneurysm-related death ($p = 0.32$) or all-cause mortality ($p = 0.147$).

Conclusion: Aneurysm-related mortality amongst patients unsuitable for open TAAA surgery is considerable and evolving endovascular techniques may permit intervention in selected patients. However any intervention can only be justified if the patient's life expectancy is sufficient to allow benefit to accrue.

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□ 2002 – 2008

(5.6 – 7cm TAAA)

✧ 216 patients assessed

✧ 89 (41%): unfit for OSR

□ Median f-up: 12 mo

✧ 49 (55%) deaths

✓ 23 (47%) rupture

HYBRID TAAA PROCEDURES

Editor's Choice — Hybrid Treatment of Thoracic, Thoracoabdominal, and Abdominal Aortic Aneurysms: A Multicenter Retrospective Study

E. Rosset^{a,*}, S. Ben Ahmed^a, G. Galvaing^a, J.P. Favre^b, C. Sessa^c, P. Lemusiaux^d, R. Hassen-Khodja^a, M. Coggia^f, S. Haulon^g, S. Rinckenbach^h, B. Enonⁱ, P. Feugier^j, E. Steinmetz^k, J.P. Becquemin^a, and the Association Universitaire de Recherche en Chirurgie

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WHAT THIS PAPER ADDS

Published results of hybrid treatment of thoracic, abdominal, and thoracoabdominal aneurysms are usually satisfactory. This multicenter study shows the potentially poor results of this treatment and questions the benefit of this type of approach, especially in patients at high risk for conventional surgery. Careful and limited selection of patients for hybrid treatment is suggested.

Objectives: The aim of this study was to assess the results of hybrid techniques for the treatment of thoracic, thoracoabdominal, and abdominal aortic aneurysms based on multicenter results and the various series regarding hybrid procedures reported in the literature.

Methods: The results of 76 hybrid procedures performed in 19 French university hospital centers between November 2001 and October 2011 were collected. There were 50 men and 26 women, mean age 68.2 (35–86) years. All patients were considered at high risk (ASA ≥ 3) for conventional surgery. Aneurysms involved the thoracic, abdominal, and thoracoabdominal aorta in five, 14, and 57 cases respectively. There were 11 emergent repairs. The revascularization of four visceral arteries was performed in 38 cases. Between one and three visceral arteries were revascularized in the other cases. Visceral artery debranching and stent graft deployment were performed in a one-stage procedure in 53 cases and in a two-stage procedure in 23 cases.

Results: There were 26 (34.2%) postoperative deaths. Nine of the survivors developed paraplegia, of which one resolved completely. Bowel ischemia occurred in 13 cases (17.1%), and one patient was treated by a superior mesenteric artery bypass. Four patients required long-term hemodialysis. Postoperative computed tomography scan showed a type II endoleak in two patients.

Conclusions: Morbidity and mortality in this study were greater than previously reported. Candidates for hybrid aortic repair should be carefully selected.

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Keywords: Thoracoabdominal aortic aneurysms, Hybrid procedures, Endovascular aortic repair

□ 2001 - 2011

✧ 19 French Univ. Hospitals

✧ 76 patients (57 TAAA)

✧ 11 emergent cases

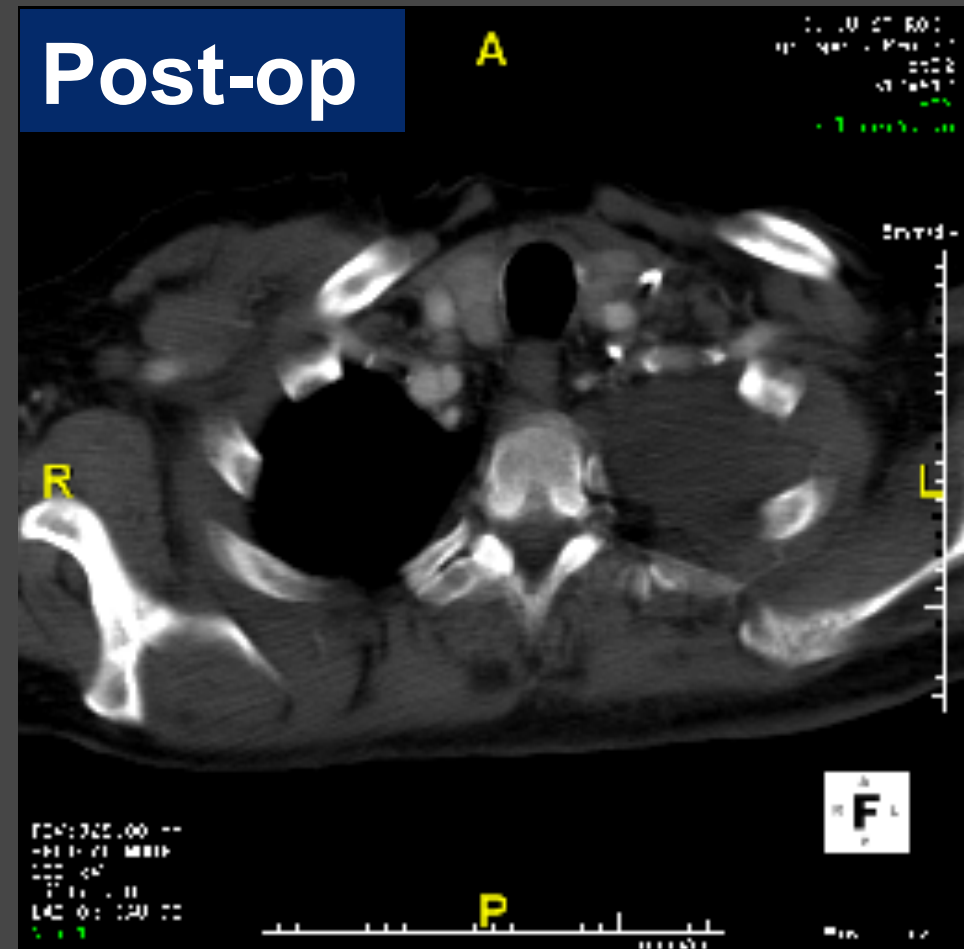
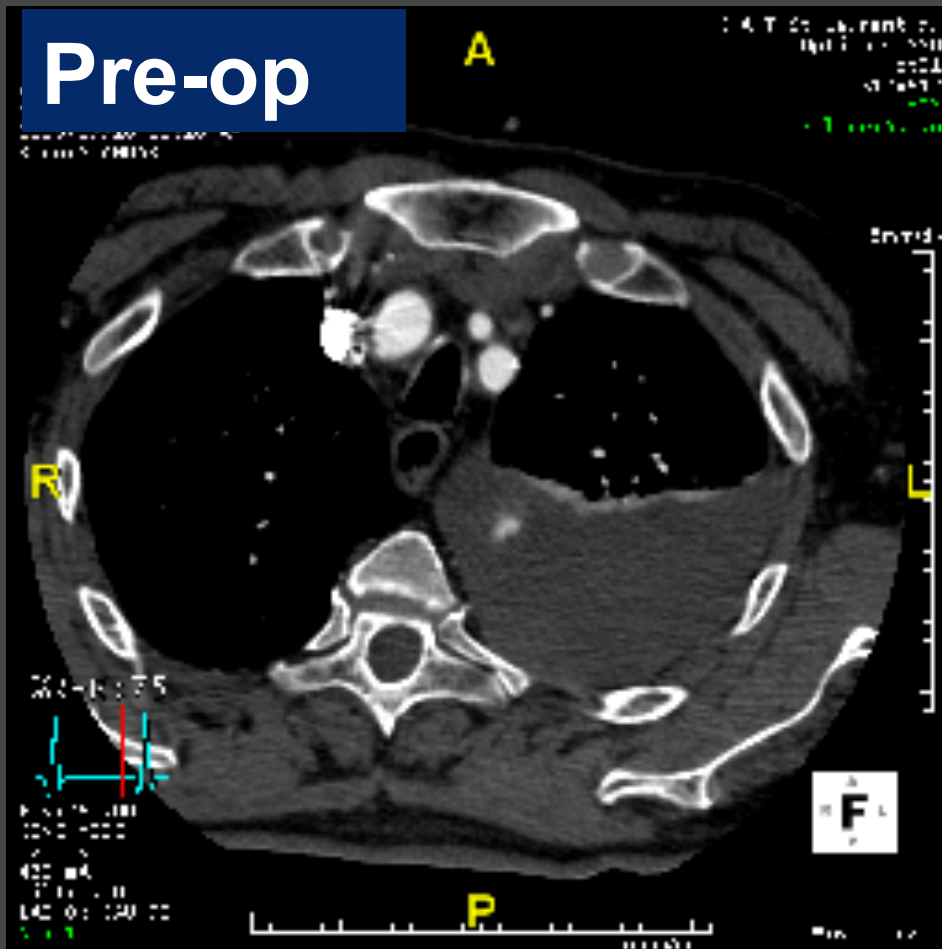
□ 30-d mortality: 34.2%

✧ Paraplegia: 18%

✧ Bowel ischemia: 17%

TOTAL ENDOVASCULAR APPROACH

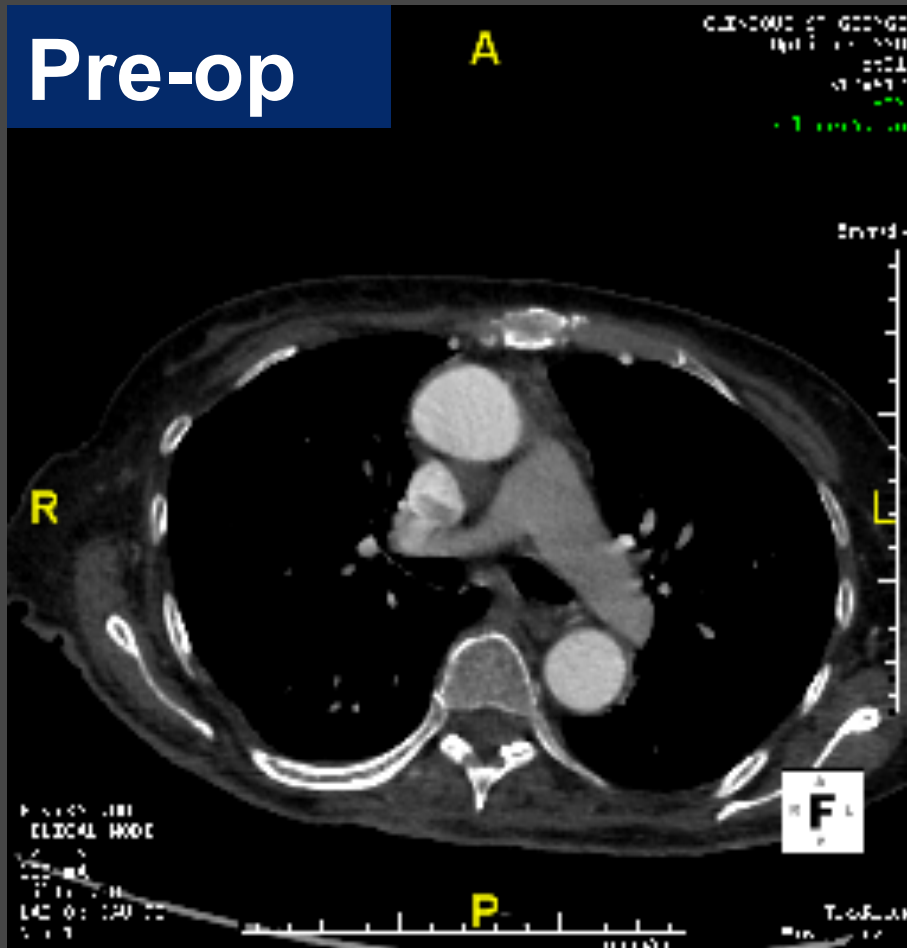
- ❑ **Illustrative case 1: 68-yr old, male, COPD, cardiac insufficiency, 68mm rTAAA, Hemothorax, Hemomediastin**



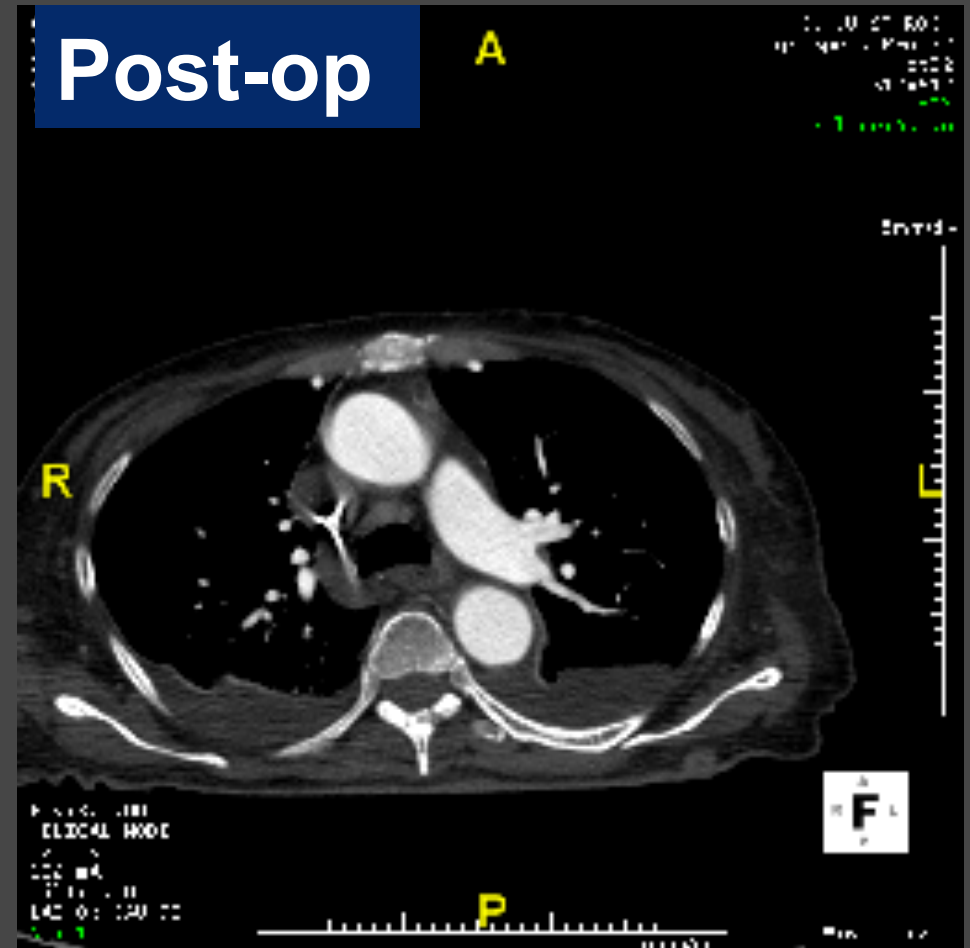
TOTAL ENDOVASCULAR APPROACH

- Illustrative case 2: 81-yr old, female, previous EVAR with type I endoleak, chronic rTAAA with new-onset acute back pain, retroperitoneal infiltration

Pre-op

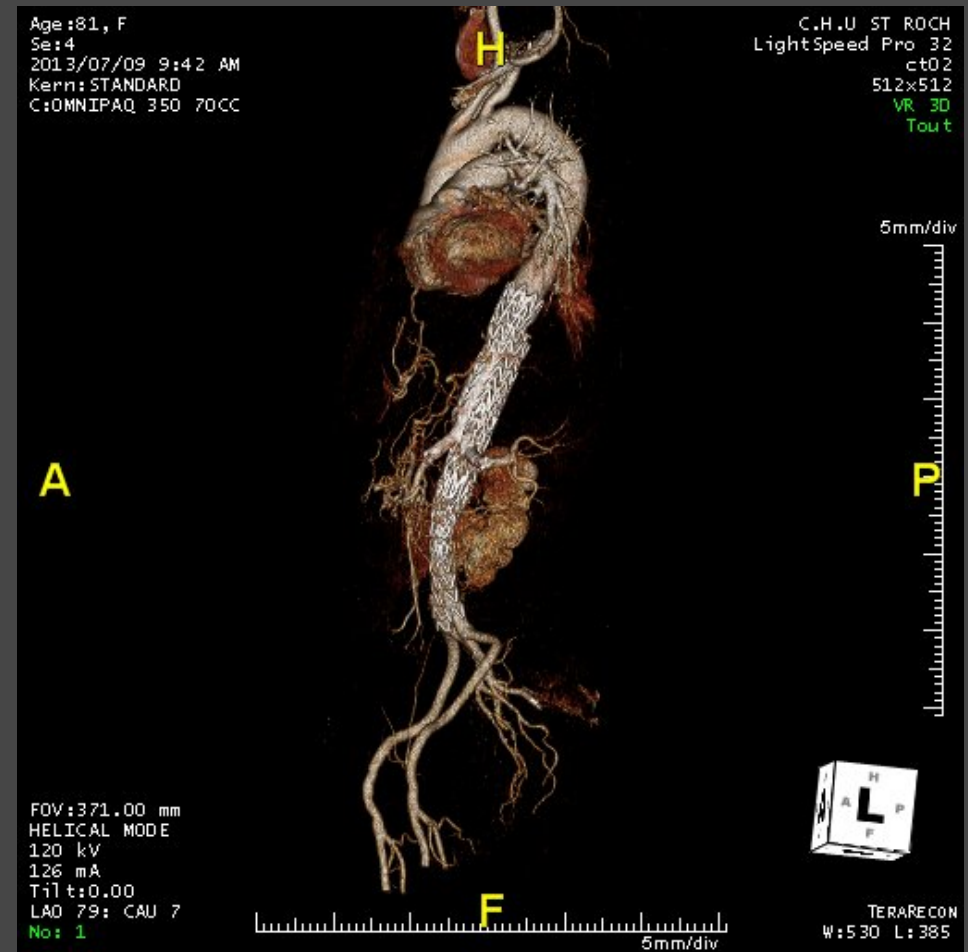
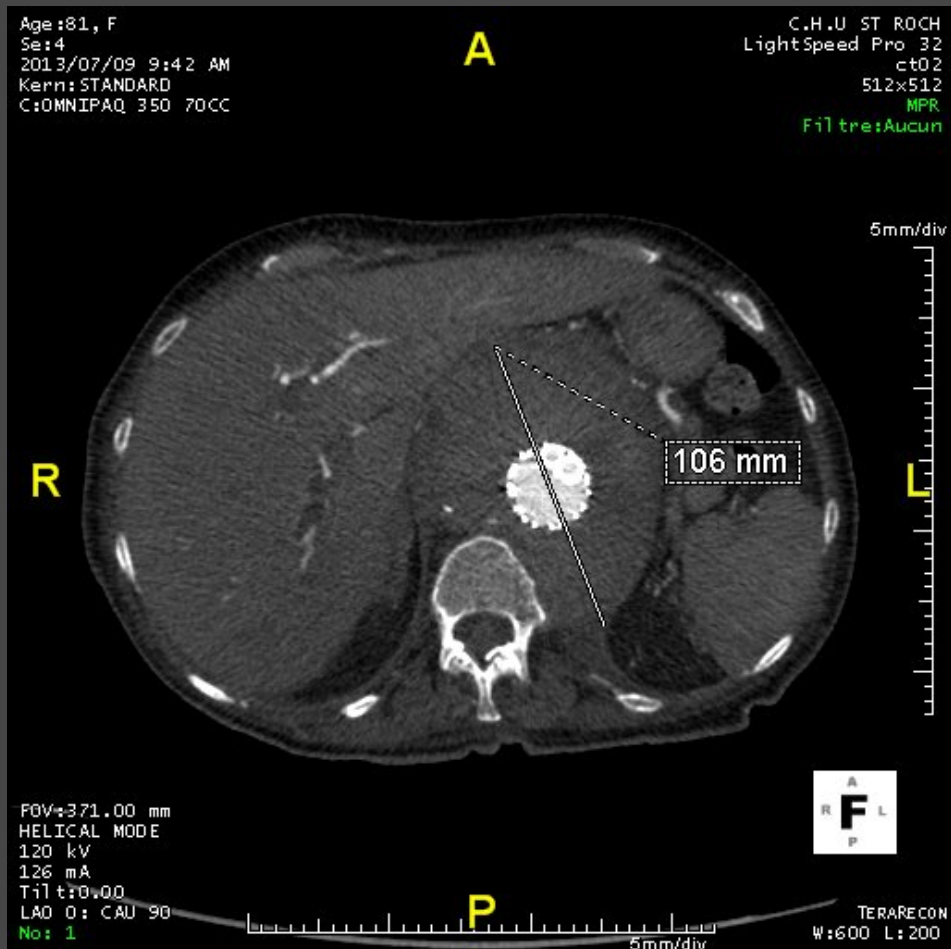


Post-op



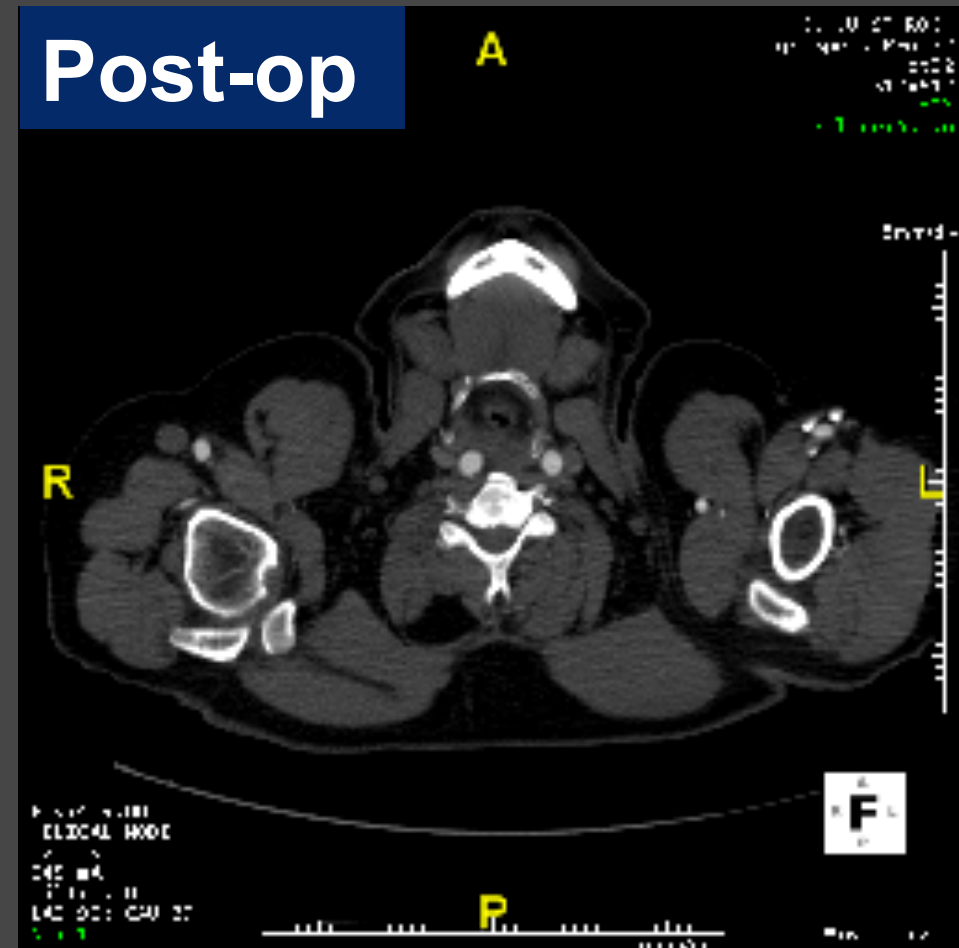
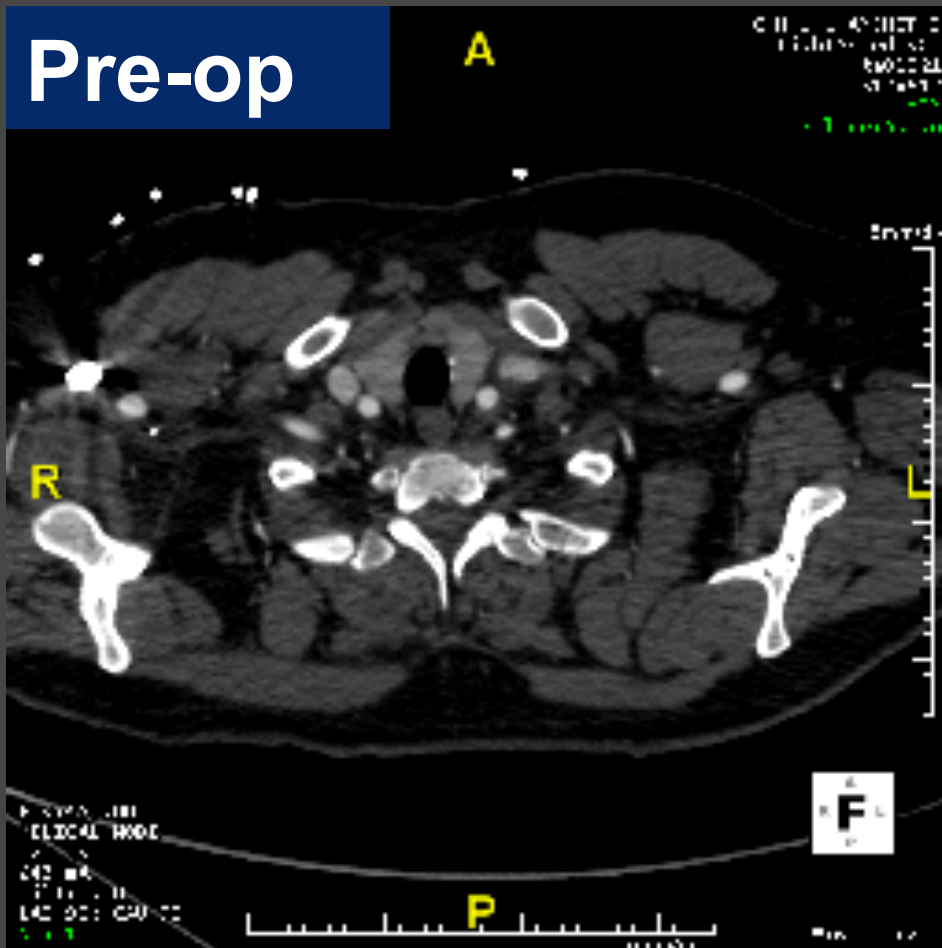
TOTAL ENDOVASCULAR APPROACH

- Illustrative case 2: 81-yr old, female, previous EVAR with type I endoleak, chronic rTAAA with new-onset acute back pain, retroperitoneal infiltration



TOTAL ENDOVASCULAR APPROACH

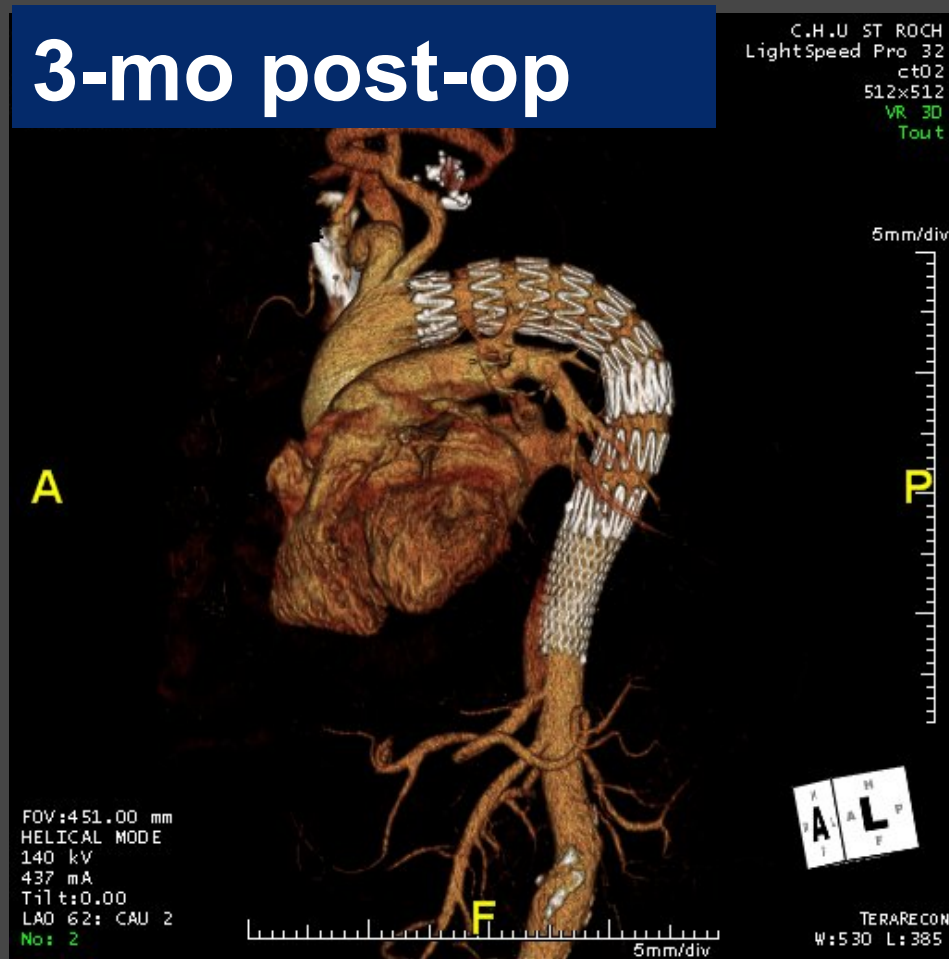
- Illustrative case 3: 58-yr old, male, HTA, Diabetes type 2, Obesity, ruptured type B aortic dissection, initial instability, hemothorax, hemomediastinum



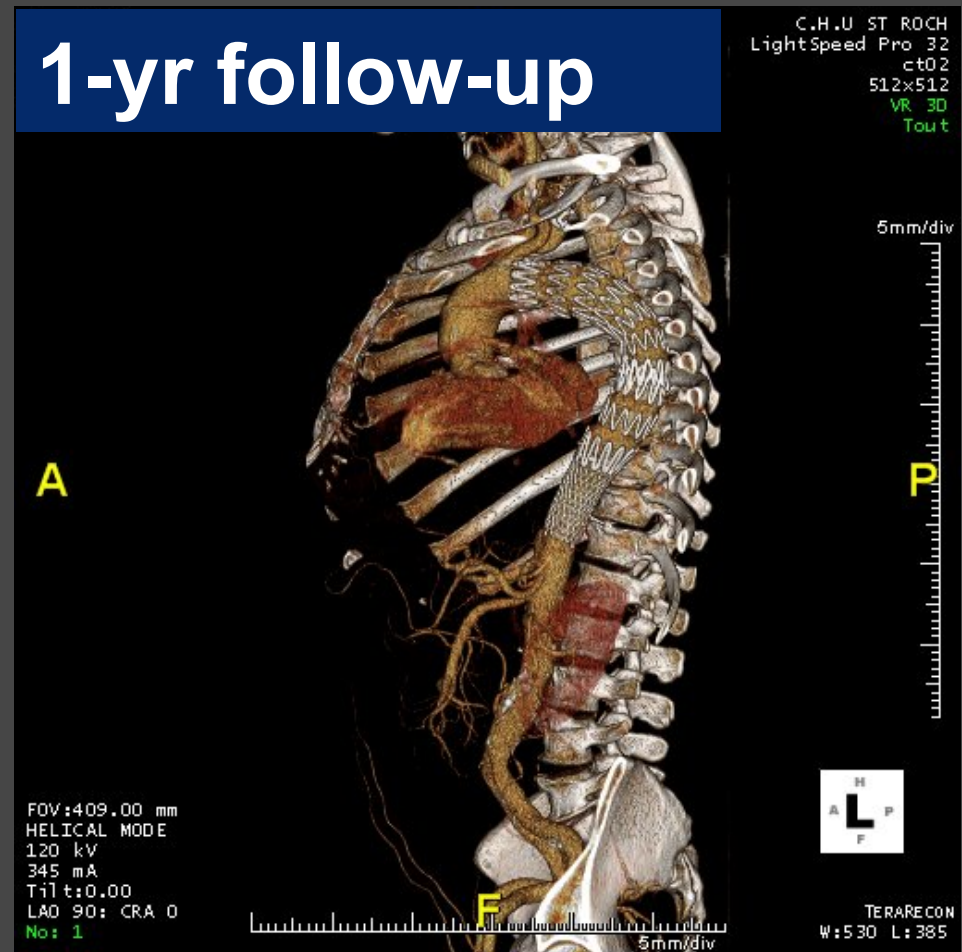
TOTAL ENDOVASCULAR APPROACH

- Illustrative case 3: 58-yr old, male, HTA, Diabetes type 2, Obesity, ruptured type B aortic dissection, initial instability, hemothorax, hemomediastinum

3-mo post-op



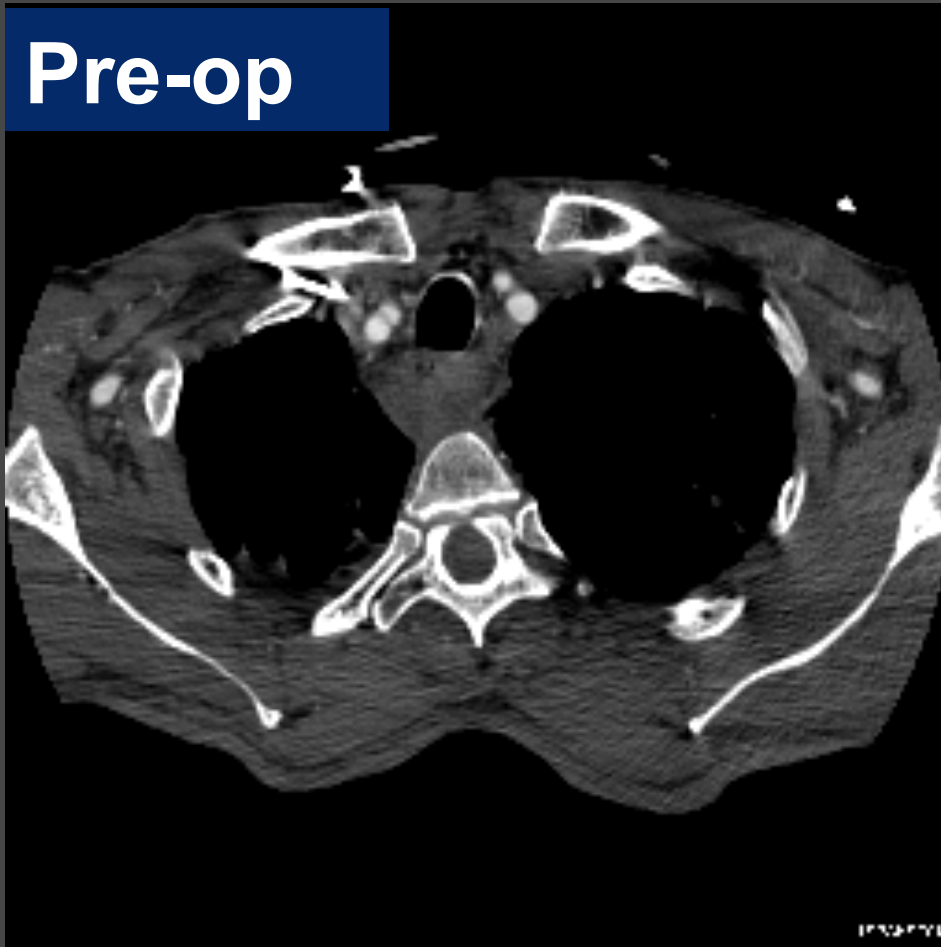
1-yr follow-up



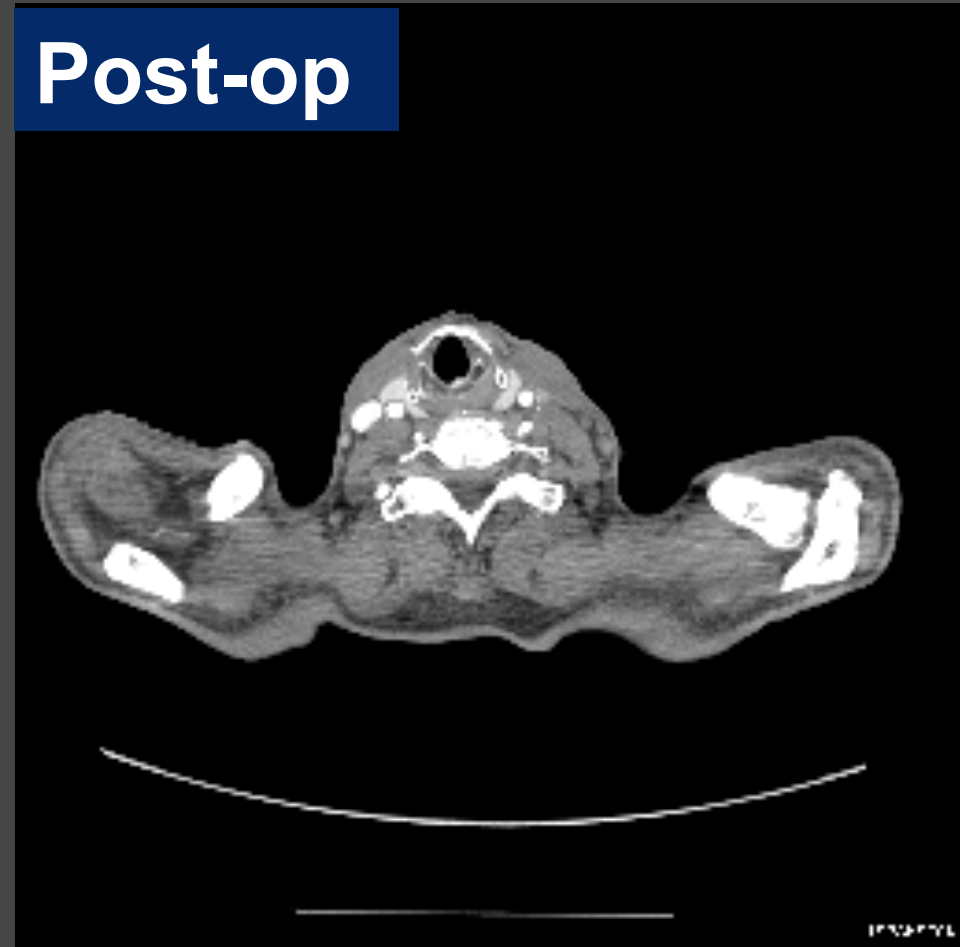
TOTAL ENDOVASCULAR APPROACH

- Illustrative case 4: 63-yr old, male, HTA, heavy smoker, ruptured type B aortic dissection, Glasgow CS : 10 and new-onset tetraplegia at admission

Pre-op

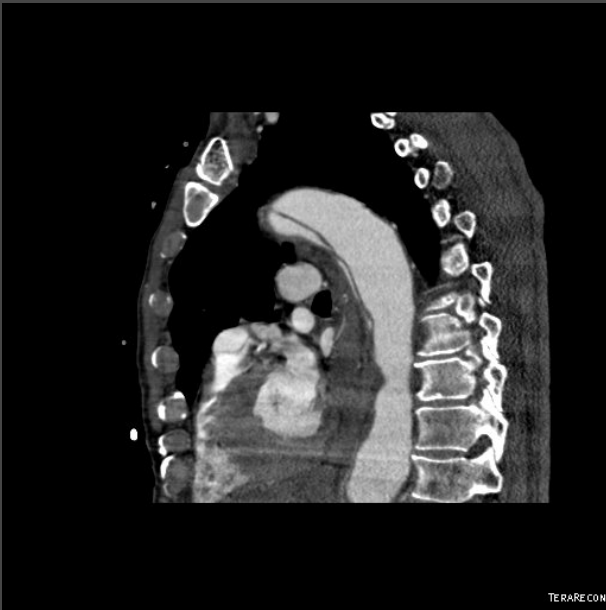


Post-op

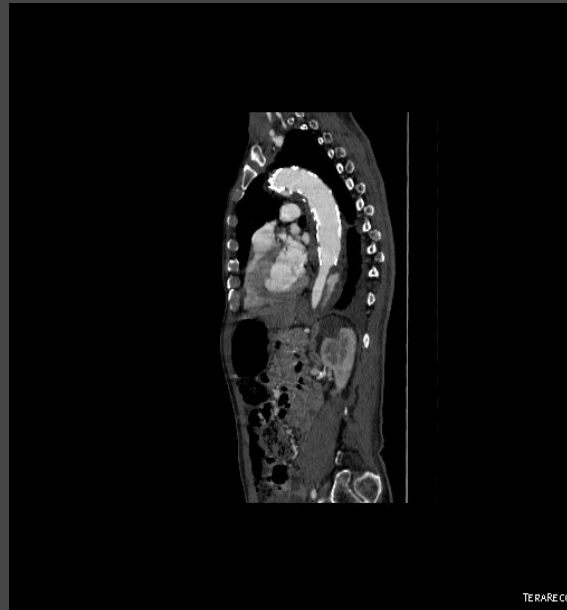


TOTAL ENDOVASCULAR APPROACH

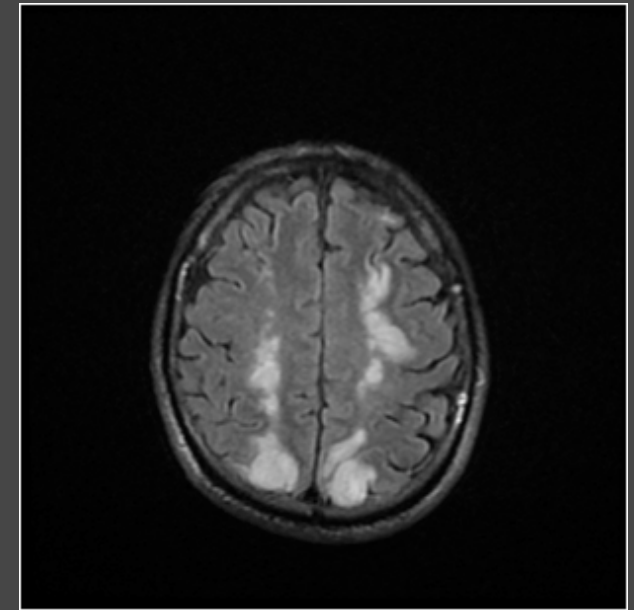
- Illustrative case 4: 63-yr old, male, HTA, heavy smoker, ruptured type B aortic dissection, Glasgow CS : 10 and new-onset tetraplegia at admission



Pre-op



Post-op



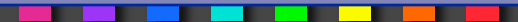
**Bilateral
watershed
stroke**

✓ Full recovery from tetraplegia at 3-mo

TOTAL ENDOVASCULAR APPROACH

Our experience:

Period	2009 - 2014
N	13 patients
Gender	9 men / 4 women
Age	78 (58 – 85)
Pathology	4 ruptured Type B dissection
	3 chronic rTAAA + new-onset pain
	6 acute rTAAA / hemothor. or mediast
Sandwich Tech.	To preserve target vessels (5 cases)
Paraplegia	1/13 (7.6%) also fatal
In-hosp. deaths	2/13 (15%)



TOTAL ENDOVASCULAR APPROACH

Surgeon-modified fenestrated-branched stent grafts to treat emergently ruptured and symptomatic complex aortic aneurysms in high-risk patients

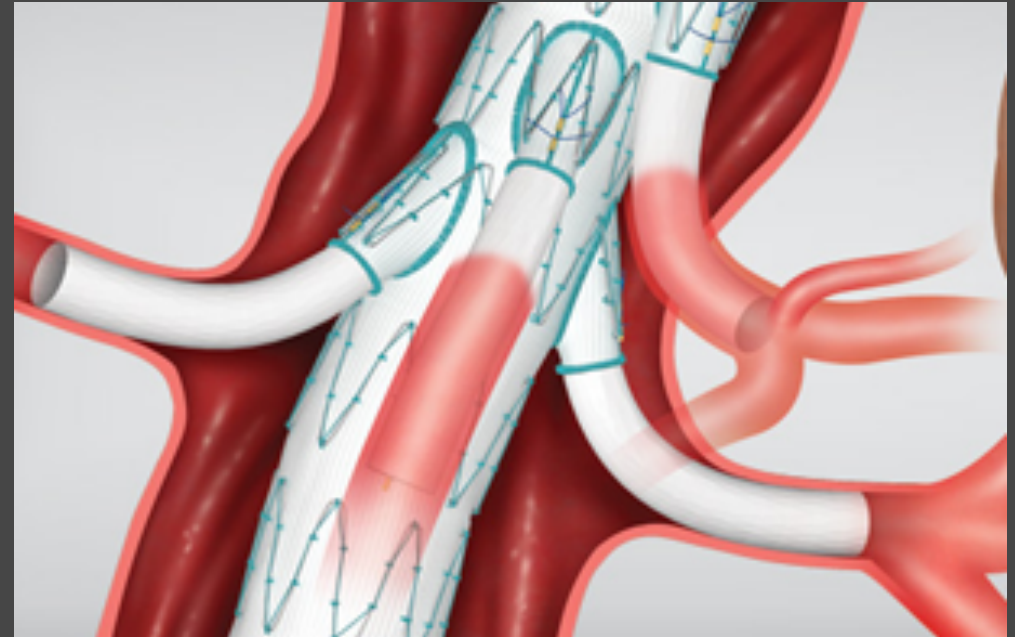
Joseph J. Ricotta, II, MD, MS, and Nikolaos Tsilimparis, MD, Atlanta, Ga

Introduction: Fenestrated-branched stent grafts have been developed as a minimally invasive, endovascular alternative for the treatment of complex aortic aneurysms in high-risk patients. However, the manufacture of these devices can take as long as 6 to 12 weeks, and therefore, they cannot be used to treat aortic emergencies. We reviewed our experience with surgeon-modified, fenestrated-branched stent grafts (sm-FBSGs) in high-risk patients who presented as emergencies with ruptured or symptomatic complex aortic aneurysms.

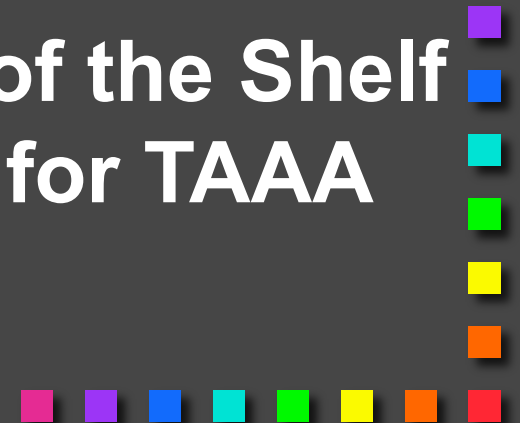
Methods: All patients treated with sm-FBSGs at our institution were retrospectively reviewed. Patients presenting with acute symptoms or an emergency indication for repair were analyzed.

Results: Twelve high-risk patients (nine men), of which seven were at American Society of Anesthesiologists class 4 and five were at class 3, presented with seven symptomatic and five ruptured aortic aneurysms. Mean age was 71 years (range, 52-86 years), and mean maximal aneurysm size was 8.1 cm (range, 5-12 cm). Six patients (50%) had prior aortic surgery or a hostile abdomen. Relevant comorbidities included coronary disease in all 12 patients, and seven (58%) had an ejection fraction $\leq 35\%$. Nine patients (75%) had severe pulmonary dysfunction. Four aneurysms were pararenal, and eight were thoracoabdominal (two type II, three type III, and three type IV). An average of three visceral vessels (range, 2-4) were treated per patient, with 35 branches targeted. Endografts were successfully implanted in all patients. There was no paraplegia or intraoperative death. One patient (8.3%) died of subarachnoid hemorrhage ≤ 30 days. Reintervention was necessary in two patients, for a type 3 endoleak and for evacuation of a retroperitoneal hematoma. Morbidity included one myocardial infarction, and two patients each with transient respiratory failure and transient renal insufficiency not requiring dialysis. Mean postoperative length of stay was 4 days in the intensive care unit and 8 days in the hospital. At a mean follow-up of 9 months (range, 3-18 months), two patients died of non-aneurysm-related causes. Branch vessel patency was 100%. No late reinterventions were necessary. No type I or III endoleaks occurred. One type II endoleak is under observation.

Conclusions: Sm-FBSG may play an important role in the treatment of select patients with symptomatic or ruptured complex aortic aneurysms who are at prohibitive risk for open surgery and in whom endovascular repair cannot be delayed to allow implantation of a custom-made commercial device. Until an off-the-shelf fenestrated-branched device is created that does not require a prolonged waiting period, this may be the best option to treat patients with symptomatic or ruptured complex aneurysms that are at excessively high surgical risk. (J Vasc Surg 2012;56:1535-43.)



T-Branch: of the Shelf stent-graft for TAAA



CONCLUSIONS

- ❑ Management of rTAAA remained a very challenging endeavor with significant morbidity and mortality
- ❑ Necessity to keep the procedure as simple as possible to guarantee clinical success
- ❑ The endovascular treatment requires sometimes skillfull endovascular specialist.

