Objective assessment of current stent grafts: which graft for which lesion

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Conflict of interest: none

Introduction

- **Different diseases**
- **Different localizations:**
  - Aortic arch
  - Descending thoracic aorta
- **Recent evolution of available thoracic stent-grafts**

Thoracic stent-grafts

- **Available devices**
- Selection criteria
- Strategy

Available devices

1.	Conformable Tag	Gore
2.	Zenith TX2 proform	Cook
3.	Valiant Captivia	Medtronic
4.	Relay	Bolton medical

Conformable Tag Gore

- **Nitinol stent framework /PTFE**

- Diameter:

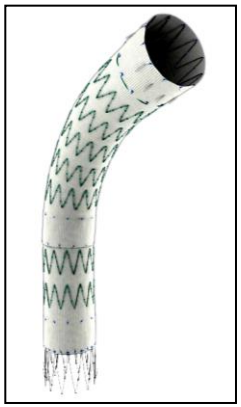
  21-45 mm

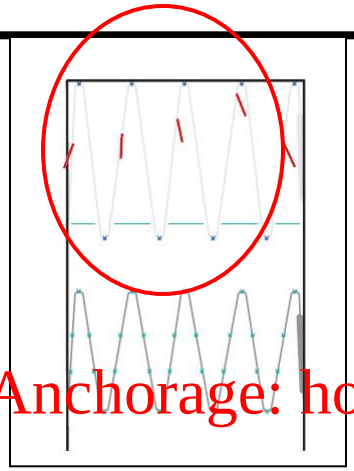
- Sheath

  18-24 Fr

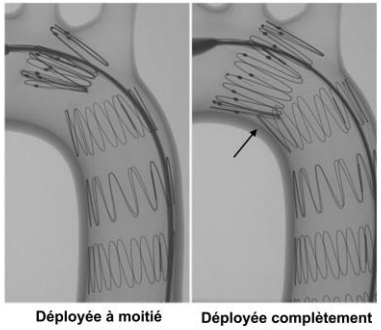
Zenith TX2 proform Cook

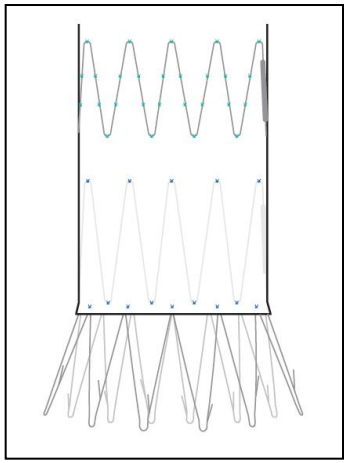
- **Selfexpanding stainless steel Gianturco Z-stents Dacron**
- 2 Modules
- Diameter:
  22-42 mm
- Sheath
  20-22 Fr

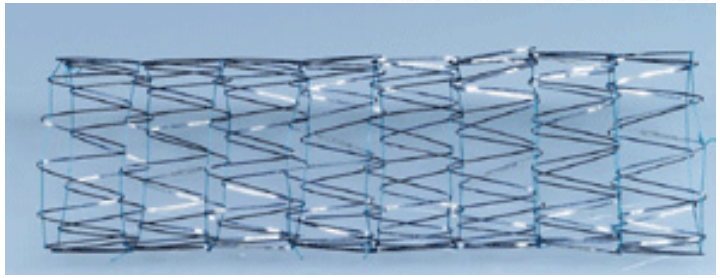




Proximal edge







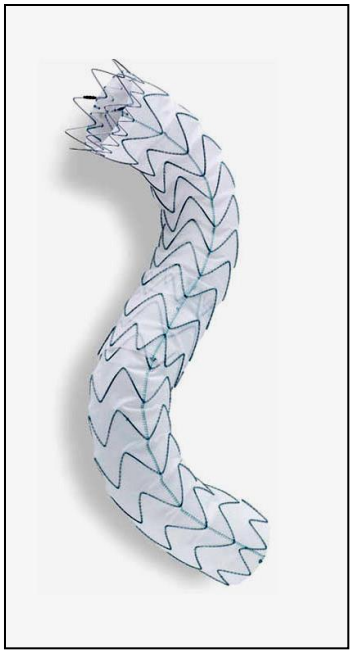
Distal edge

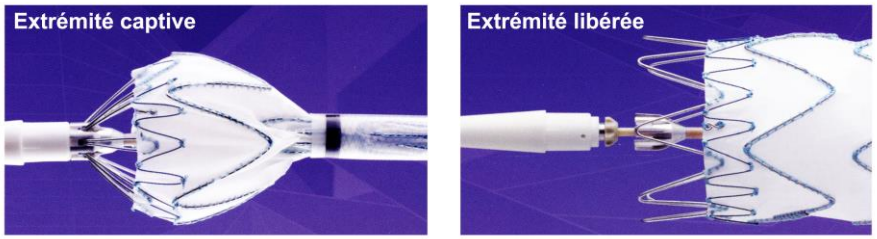
Valiant Captivia Medtronic

- **Nitinol stent framework / Polyester graft**

- Diameter:
  22-46 mm

- Sheath
  22-25 Fr





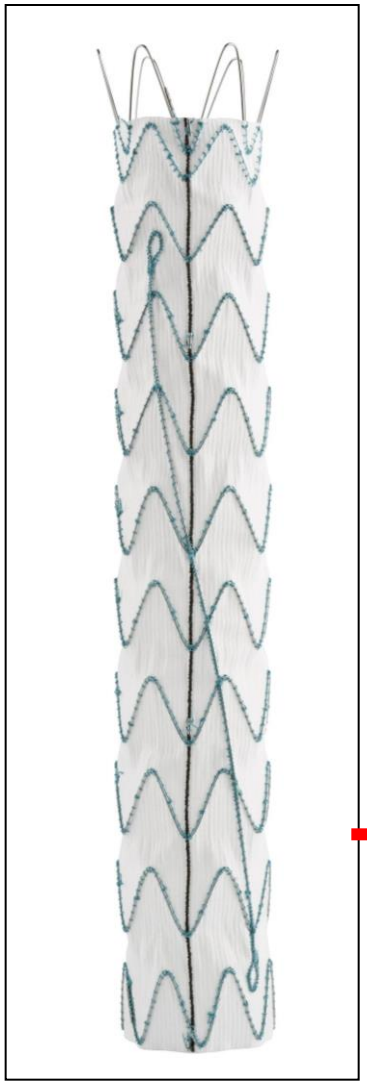
Système de maintien de l'extremité proximale de l'endoprothèse Valiant Captivia

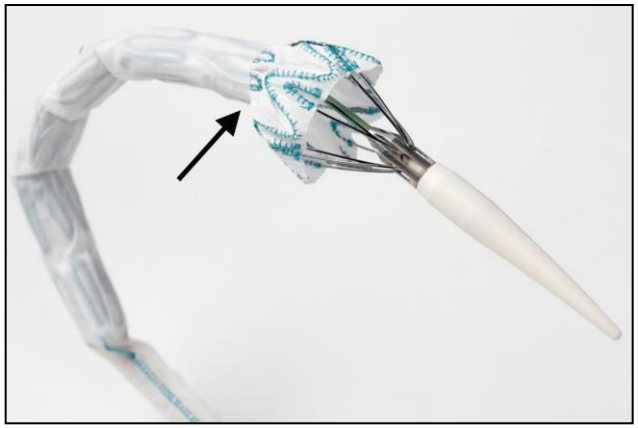
Relay Bolton medical

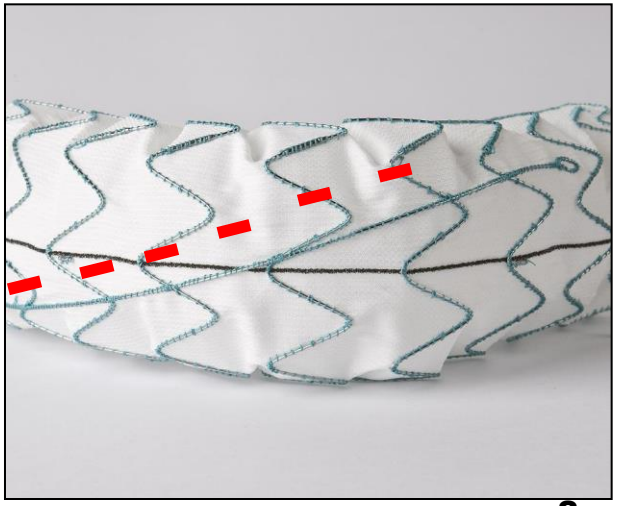
- **Nitinol Stent framework**
  Polyester graft

- Diameter:
  22-46 mm

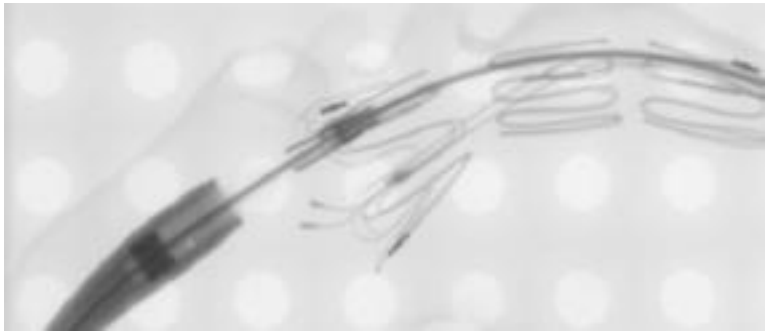
- Sheath
  22-26 Fr







Relay Bolton Medical



Relay NBS Plus

Thoracic stent-grafts

- **Available devices**
- **<u>Selection criteria</u>**
- **Strategy**

According to the features of the available stent-grafts

- **Iliofemoral access:**

  Smallest sheath

  Gore 18 FR

- **Aortic neck**

  Small aortic neck:

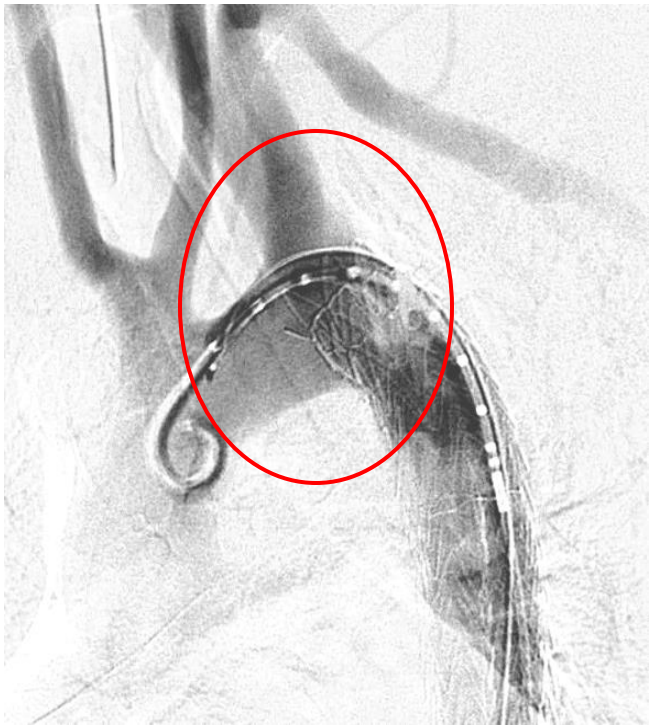
  Gore C TAG 21 mm **Aortic neck ≥ 16 mm**

According to the features of the available stent-grafts

- **Conformability**
  - **Type I endoleak**

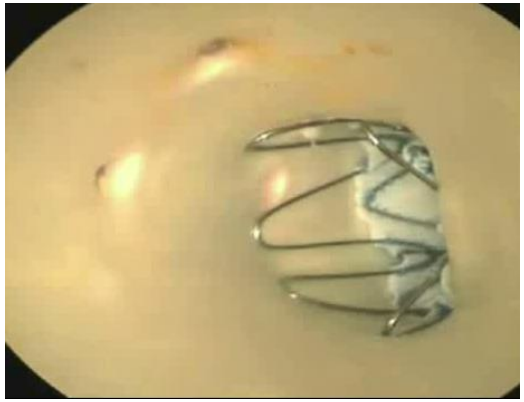
    Dake Radiology 2010
  - **Collapse**

    Canaud JTCS 2010
  - **Migration**



According to the features of the available stent-grafts

- **Conformability:**
  - **Experimental study** Valiant
    - Excessive oversizing: negative impact
    - To secure proximal anchorage
      - Radial force
      - Presence of a proximal open stent segment



Canaud L, Alric P, Laurent M, Baum TP, Branchereau P, Marty-Ané CH, Berthet JP. Proximal fixation of thoracic stent-grafts.. JEVT. 2008

According to the features of the available stent-grafts

- **Conformability: Experimental study**

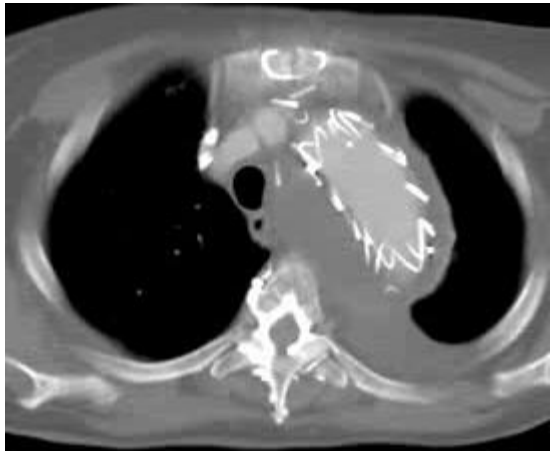
	2013	***2008***
Valiant:	up to 140°	140°
C-TAG:	up to 120°	90°
Relay:	up to 110°	80°
Zenith Pro-Form :	up to 110°	70°

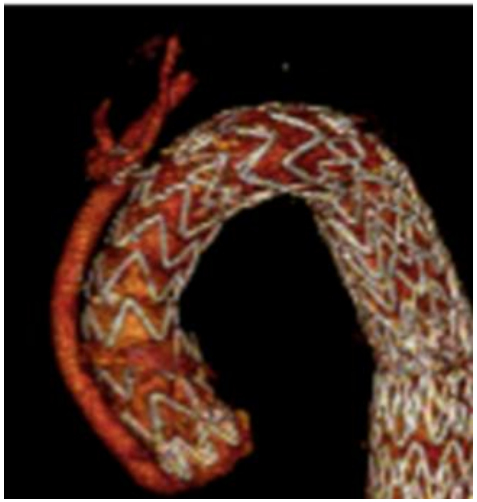
p = .001

Canaud L, Cathala P, Joyeux F, Branchereau P, Marty-Ané C, Alric P
Improvement in conformability of the latest generation of thoracic stent grafts.
JVS. 2013

According to the features of the available stent-grafts

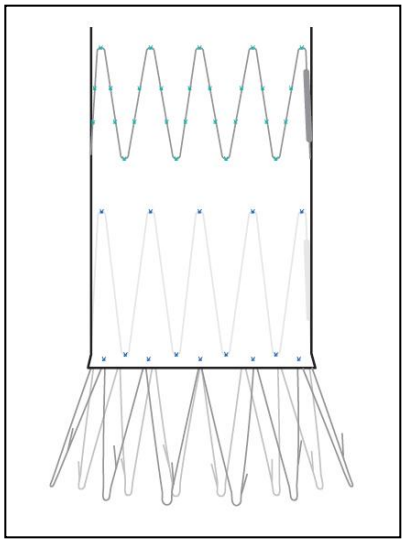
- **Accuracy of the delivery system**
  - *Proximal*: Valiant / Zenith / Relay

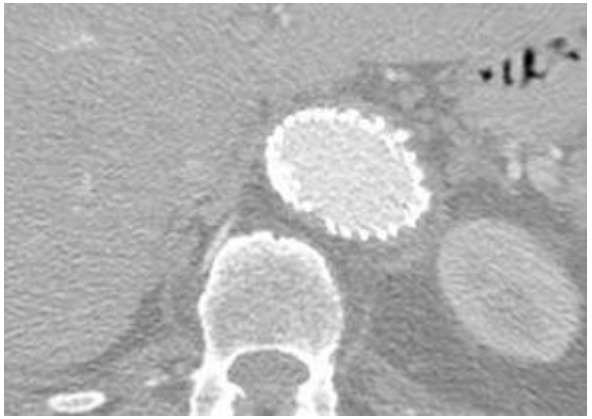




According to the features of the available stent-grafts

- **Accuracy of the delivery system**
  - *Distal*: Celiac trunk: Zenith





According to the features of the available stent-grafts

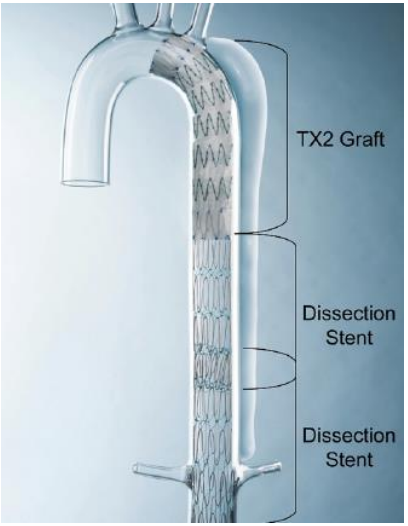
- **Retrograde aortic dissection**
  - **MOTHER database and systematic review: n=9594**
  - **Incidence of RTAD was not significantly different: p=.49**
    - With proximal bare stent (2.8%)
    - Non-bare stent (2.4%)

Canaud L, Ozdemir BA, Patterson B, Holt P, Loftus I, Thompson M. Retrograde aortic dissection after thoracic endovascular aortic repair. Ann Surg. 2014

According to the features of the available stent-grafts

- **Distale Bare stenting for aortic dissection: n 108**

  - **False-lumen patency:**
    - Acute: complete reattachment
    - Chronic: failed to supress completely
  - **Reintervention rate: 16.6%**
  - **Device failure rate: 9.2%**



Canaud L, Patterson BO, Peach G, Hinchliffe R, Loftus I, Thompson MM. Systematic review of outcomes of combined proximal stent grafting with distal bare stenting for management of aortic dissection. JTCS. 2013

According to the features of the available stent-grafts

- **Distale Bare stenting for aortic dissection**

  - **Stenosis of the visceral arteries**
    - Supplied by the false lumen: 54.5%
    - Supplied by the true lumen: 7.9%

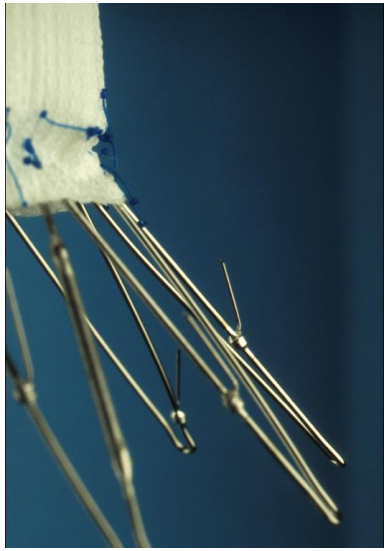
Faure E, Canaud L, Cathala P, Serres I, Marty-Ané CH, Alric P..
Assessment of abdominal branch vessel patency after bare-metal stenting of the thoracoabdominal aorta in a human ex vivo model of acute type B aortic dissection
JVS. 2014

Thoracic stent-grafts

- Available devices
- Selection criteria
- Strategy

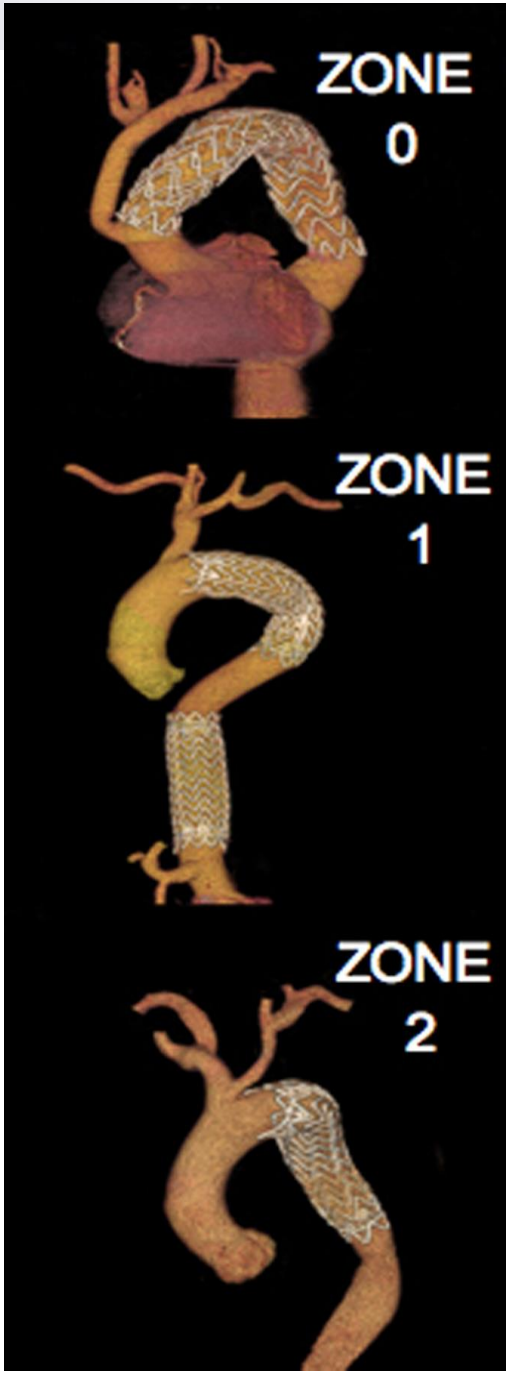
Strategy: Degenerative aneurysm

- ***Descending thoracic aorta***
  - Straight neck: all the stent-graft
  - Short distal neck: Zénith Proform



Strategy: Degenerative aneurysm

- ***Aortic arch :***
  - **> 2cm proximal neck:**
    Conformability
    C Tag / Valiant
  - **Short proximal neck:**
    Accuracy / Conformability
    Valiant Captivia
  - **Aortic valve** Proximal tip
    C Tag



Strategy

- ***Traumatic rupture :***
  - **Small aorta** — C Tag
  - **Short proximal neck**

    Accuracy / Conformability — Valiant Captivia (22 mm)

- ***Type B dissection:***
  - **Risk of RTAD** — C Tag
  - **Short proximal neck**

    Accuracy / Conformability — Valiant Captivia

Results

- 48 patients: traumatic rupture
  - First-generation thoracic stent-grafts: 32
  - Second-generation thoracic stent-grafts: 15

- Decreased stent-graft related morbidity: 18.7% to 6.2%

p=0.0003

Canaud L, Joyeux F, Berthet JP, Hireche K, Marty-Ané C, Alric P. Impact of stent-graft development on outcome of endovascular repair of acute traumatic transection of the thoracic aorta. JEVT. 2011

Conclusion

- **Stent-grafts have different features**
  - Size des endoprothèse
  - Conformability
  - Accuracy
  - Parietal stress

- **Knowledge of stent-graft features and personal experience: to guide the choice**