Clampless sutureless anastomosis technique

Zoran Rancic, MD, PhD
on behalf of Vascular Specialists @ UHZ
Descending Aorta
Clampless sutureless anastomosis technique

Zoran Rancic, MD, PhD
on behalf of Vascular Specialists @ UHZ
The outcome in the United States after thoracoabdominal aortic aneurysm repair, renal artery bypass, and mesenteric revascularization

Derrow AE. J Vasc Surg 2001

30-d Mortality: 20%
Complications: 62%
Bad outcome: 40%
TAAA - COS

Maximally invasive

Good results only in few centers
- High volume
- Limited resources
- Highly selected patients

In 10-20 years experienced “old fashioned” surgeons extinct
## Multi-Branched Stent-Graft for Type III Thoracoabdominal Aortic Aneurysm

Timothy A.M. Chuter, MD, Roy L. Gordon, MD, Linda M. Reilly, MD, Laura K. Pak, MD, and Louis M. Messina, MD

### Table: Author Year Journal Study N= Mean Age (years) Previous aortic surgery (%) Mortality: 30 days (%) Hemo-dialysis permanent (%) Paraplegia Permanent (%)

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
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<td>Amiot fenestrated</td>
<td>2010</td>
<td>EIVES</td>
<td>24 French Services</td>
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<td>73</td>
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</table>
Complete EVAR

Prohibitive X-ray exposition
- Patient & physician

High costs

Good results only in few centers
- High volume
  - Limited resources
  - Highly selected patients
Repair of type IV thoracoabdominal aneurysm with a combined endovascular and surgical approach

William J. Quiñones-Baldrich, MD, Thomas F. Panetta, MD, Candace L. Vescera, RN, and Vikram S. Kashyap, MD, Los Angeles, Calif

We report an unusual case of type IV thoracoabdominal aneurysm (TAA) with superior mesenteric artery (SMA), celiac artery, and bilateral renal artery aneurysms in a patient who underwent an earlier repair of two infrarenal abdominal aortic aneurysm (AAA) ruptures. Because of the presence of the visceral artery aneurysms and the earlier operation through the retroperitoneum, standard surgical treatment via a retroperitoneal approach with an inclusion grafting technique was considered difficult. A combined surgical approach achieving retrograde perfusion of all four visceral vessels and endovascular grafting allowing exclusion of the TAA was accomplished. Complete exclusion of the aneurysm and normal perfusion of the patient’s viscera was documented by means of follow-up examinations at 3 and 6 months. The repair of a type IV TAA with a combined endovascular and surgical approach (CESA) allowed us to manage both the aortic and visceral aneurysms without thoracotomy or re-do retroperitoneal exposure and minimized visceral ischemia time. If the durability of this approach is confirmed, it may represent an attractive alternative in patients with aneurysmal involvement of the visceral segment of the aorta. (J Vasc Surg 1999;30:555-60.)
Standard

COS

HYBRID

CEVAR

Invasiveness
General Challenges of „Debranching“

Multiple anastomosis (up to 15, mean 6 to 8)
- Ischemia-reperfusion of all abdominal organs

Long lasting interventions
- Homeostasis generally disturbed
- Temperature often below 34 to 35° C
- Coagulation often disturbed
- Fluid balance mostly highly positive
- ...

Polymorbid patients
- Negative selection, since regarded less invasive
Challenges in Aortic Branches Surgery

Anatomical remodelling

Difficult access

Scar tissue
TOOL TO FACILITATE DEBRANCHING
TOOL TO FACILITATE DEBRANCHING

STAT TECHNIQUE
Sutureless Telescop ing Anastomotic Technique
VORTEC
Viabahn Open Rebranching TEChnique
VORTEC/STAT - Material
End-to-Side Anastomosis to native artery
End-to-End Anastomosis to inflow graft
End-to-Side Anastomosis to Inflow graft
Stitches to prevent stent-graft migration

Aortic branch is ligated at origin
Ischemia time during proximal anastomosis

Tool to perform challenging branch anastomosis
STAT- Sutureless Telescoping Anastomotic Technique
STAT
Sutureless Telescoping Anastomotic Technique

Proximal anastomosis of the inflow graft
Small transverse incision is closed temporarily with a Prolene running suture
STAT
Sutureless Telescopig Anastomotic Technique

<1' ischemia time
How to choose diameter of stent-graft?

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<th>Viabahn (2.5cm-5cm-10cm-15cm)</th>
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VORTEC / STAT
VISCERAL ARTERIES
RCCA dissection
STAT/VORTEC IN OPEN AORTA SURGERY
Open TAA repair
STAT / VORTEC IN THE MULTISTEP PROCEDURES
Stepwise Open Debranching

**Step 1**
Visceral arteries

**Step 2**
Renal arteries

**Step 3**
Stentgraft
Hybrid Open +Endo-Debranching

1. Open surgery
   - Step 1: Visceral arteries

2. Endovascular procedure
   - Step 2a: Renal arteries
   - Step 2b: Stentgraft
Gore Hybrid Vascular Graft
Full midline laparotomy

Bending the needle
STAT / VORTEC
FOLLOW-UP
Follow-up
HR in January 2005 (88 years old)

May 2006 (15 months)  June 2010 (64 months)
Follow-up (autopsy)
Limitations – severe/diffuse disease
"Transsection technique"
Limitations – diameter < 3.8mm
Limitations
Limitations

two-in-one plasty
VORTEC / STAT
Advantages

• Standardized technique (98% success rate)

• Minimal Vessel Dissection

• No Vessel Clamping

• Primary patency rate at 4 years > 85%
VORTEC / STAT
Levels of benefit

• Level 1
  – Reduces technical difficulties
  – Reduces ischemia time
  – No anastomotic bleeding

• Level 2
  – Reduces invasiveness of aortic surgery
    • Allows performing anastomosis where sutured anastomosis is not possible

• Level 3
  – No learning curve for endovascular surgeons
zoran.rancic@usz.ch