LAPAROSCOPIC ROBOTIC AORTIC SURGERY IS NOT DEAD BUT HAS A BRIGHT FUTURE: WHAT WILL IT BE AND WHAT IS THE EVIDENCE

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Intuitiv Surgical ®: consulting and surgical proctoring
Gore Medical®: consulting

First steps in aortic robotic surgery
Is this the end of the road?

Why did you not continue this surgical adventure?
Why laparoscopic aortic surgery is hard to do?

Technical learning curve...

Long surgical time
Exhausting for the surgeon
Making of the anastomosis
Clamping time management

ACE study results
JP. Becquemin et al. JVS 2011

Conclusions
In a selected group of patients with low to intermediate risk factors, EVAR and EVAR-B were superior in terms of major and major complications. The choice between OSR and EVAR should rely on the balance of different risks: more postoperative transfusions, a longer hospital stay, and incidental complications with OSR vs the need of follow-up with repeat CT scans, a higher rate of vascular reinterventions, and a small but persistent risk of rupture with EVAR.

Still a place for mini-invasive surgery
The greatest advantage of the robot-assisted procedure has proved to be the speed of construction of the vascular anastomosis. The median reported clamping and anastomotic times of laparoscopic aortic surgery without robots were 85.5 and 37 minutes, respectively. Reducing the time needed to construct the anastomosis also shortens the period of temporary ischemia of the lower limbs. This represents a significant reduction in the level of reperfusion.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>IFF (iliofemoral bypass)</td>
<td>17</td>
</tr>
<tr>
<td>ABFiB (accessoifemoral bypass)</td>
<td>38</td>
</tr>
<tr>
<td>AABFiB (aortobiifemoral bypass)</td>
<td>1 case</td>
</tr>
<tr>
<td>ABFiB with incisional hemia mesh repair</td>
<td>4</td>
</tr>
<tr>
<td>AIE (aortic iliobifemoral anastomosis)</td>
<td>2</td>
</tr>
<tr>
<td>CAA (common iliac artery aneurysm)</td>
<td>7</td>
</tr>
</tbody>
</table>

Conclusions: Robotic aortic surgery appears to be safe, with a high technical success rate, with operative times and success rates comparable to conventional open surgery. The creation of the aortic anastomosis appears to be quicker, and more accurate than regular laparoscopic techniques.
AAP ROBOTIC REPAIR

♂ 53 yrs (HBP, dyslipemia, smoker)

CAS | Type OP | Year | Year of death | Cause
--- | --- | --- | --- | ---
3 | ABF | 2006 | 2007 | cardiac
6 | ABF | 2007 | 2008 | suicide
11 | ABF | 2007 | 2009 | cardiac
15 | ABF | 2008 | 2010 | sudden death
23 | ABF | 2009 | 2010 | cardiac
24 | ABF | 2009 | 2011 | lung cancer
29 | ABF + AAA | 2009 | 2010 | infectious disease
32 | ABF | 2009 | 2011 | stroke
34 | ABF + AAA | 2010 | 2011 | respiratory failure
108 | ABF + AAA | 2014 | 2014 | fatal hemorrhage

EARLY MORTALITY

CAS | Type OP | Year | Year of death | Cause
--- | --- | --- | --- | ---
2 | ABF | 2006 | 2007 | cardiac
6 | ABF | 2007 | 2008 | suicide
11 | ABF | 2007 | 2009 | cardiac
15 | ABF | 2008 | 2010 | sudden death
23 | ABF | 2009 | 2010 | cardiac
24 | ABF | 2009 | 2011 | lung cancer
29 | ABF + AAA | 2009 | 2010 | infectious disease
32 | ABF | 2009 | 2011 | stroke
34 | ABF + AAA | 2010 | 2011 | respiratory failure
108 | ABF + AAA | 2014 | 2014 | fatal hemorrhage

MORTALITY

CAS | Type OP | Year | Year of death | Cause
--- | --- | --- | --- | ---
2 | ABF | 2006 | 2007 | cardiac
6 | ABF | 2007 | 2008 | suicide
11 | ABF | 2007 | 2009 | cardiac
15 | ABF | 2008 | 2010 | sudden death
23 | ABF | 2009 | 2010 | cardiac
24 | ABF | 2009 | 2011 | lung cancer
29 | ABF + AAA | 2009 | 2010 | infectious disease
32 | ABF | 2009 | 2011 | stroke
34 | ABF + AAA | 2010 | 2011 | respiratory failure
108 | ABF + AAA | 2014 | 2014 | fatal hemorrhage
For our patient:
postoperative recovery,
painless, improvement QOL…

For the vascular surgeon:
achieve surgical procedure which was complex to do with laparoscopic technique

LEARNING CURVE LAPAROSCOPY / ROBOT

10 anastomoses / surgeon (resident without any experience in laparoscopy and robotic)

Laparoscopy
Group A
Prostheses: tube 18 mm
CV 3 GoreTex

Robot
Group B
Prostheses: tube 18 mm
CV 3 GoreTex

QUANTITATIVE DATA:
Time realization (posterior wall, anterior wall, knot, total)

QUALITATIVE DATA:
Number of points distant of less than 4 mm/Total number of points (ratio of sealing)

Robotic learning curve shorter and easier
Is the robotic aortic surgery feasible? **YES**

- Routinely with a short learning curve? **YES**

Is this technique in competition with endovascular surgery?
- Is the robotic aortic surgery feasible? **YES**
- Routinely with a short learning curve? **YES**
- Is this technique in competition with endovascular surgery? **NO, complementary techniques**
- Is it more expensive?
- Is there a gain for the patient? **YES**
The road is still open!

Robotic aortic surgery is not dead but has a bright future