praceliac aorta, superior mesenteric artery, renal arteries, and iliac artery bifurcations. Mean values or oral examination scores were 5.5 vs. 7.5, 20% vs. 94%, 19% vs 86%, 30% vs 88%, and 29% vs. 87%, respectively (all P < .001) and median or scores were 1.1 vs 2.9, 1.3 vs 3.5, 1.2 vs 3.2, 1.2 vs 3.7, and 1.5 vs 3.9, respectively (all P < .001).

Conclusions: Fresh cadaver laboratory sessions can provide a learner-centered and safe environment for acquiring procedural understanding and operative confidence of complex vascular exposures and allow for transformational change that is essential to becoming a competent vascular surgeon.

Osteoprotegerin Serum Levels in Abdominal Aortic Aneurysm
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Objectives: Serum levels of osteoprotegerin (OPG) are a significant marker for the prediction of cardiovascular disease severity and patient mortality. Its association with abdominal aortic aneurysm (AAA) is still a matter of discussion. The aim of our prospective nonrandomized study was to find if any correlation existed between serum levels of OPG and AAA.

Methods: In 45 patients operated on for AAA, venous (peripheral blood samples before operation) and arterial OPG serum levels (aneurysm blood samples during open surgery) were evaluated by multiplex immunodot assay (xMAP) technology. Plasma OPG levels were correlated with age, gender, diameter, and symptoms of AAA, hypertension, smoking, diabetes mellitus, carotid artery stenoses, peripheral arterial stenoses, or other factors (statistical analysis was performed using an average abdominal incision of 13 cm to implant the DaVinci S Surgical System was used for the aortic dissection in all cases and the aortic anastomosis in three. Institutional Review Board approval and informed consent were obtained.

Results: The 21 patients (6 women, 15 men) were an average age of 65.7 years (range, 44-86 years) and body mass index of 27.23 kg/m², and 90.4% were American Society of Anesthesiology 3 or 4. Twenty patients (95.2%) underwent successful robotic dissection of the abdominal aorta. One patient underwent conversion to open AAA repair due to trocar injury. Of the remaining 20 patients, the average robotic dissection of the infrarenal aorta was 113.1 minutes and average aortic clamp time was 86 minutes. Procedures in 15 patients were performed with a minilaparotomy using an average abdominal incision of 13 cm to implant the DaVinci S robotic platform.

Conclusions: In this selected group of patients, totally robotic aortic surgery for aortic dissection and vascular reconstruction is feasible. For aortic procedures completed totally robotically without an abdominal incision, the estimate blood loss was significantly less than robotic-assisted procedures with minilaparotomy.

Interpreting the EVAR versus OPEN Repair Randomized Trials: A Critical Meta-Analysis
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Objectives: Although endovascular aneurysm repair (EVAR) has lower perioperative complications than open aortic aneurysm repair (OPEN), its benefits may be compromised by an increase in secondary interventions and a possible increase in late mortality. The goal of this study was to explore these findings using an analysis of randomized controlled trials (RCTs) comparing the outcomes of EVAR and OPEN.

Methods: A meta-analysis of RCTs comparing EVAR with OPEN was performed, encompassing 2484 patients. Outcome measures included all-cause mortality (early, late, total), AAA-related mortality (early, late, total), graft-related complications, and secondary interventions.

Results: A total of 349 deaths (28.1%) occurred among 1243 EVAR patients, and 367 deaths (29.6%) among 1241 OPEN patients. EVAR was associated with a significant benefit in early all-cause mortality (1.3% vs 4.7%), with an odds ratio (OR) of 0.27 (95% confidence interval [CI], 0.15-0.49; P < .001). However, no significant differences were noted for late all-cause mortality (OR, 1.04; 95% CI, 0.86-1.27; P = .67), or total all-cause mortality (OR, 0.95; 95% CI, 0.77-1.12; P = .43). EVAR was associated with a significant reduction in early AAA-related mortality (1.4% vs 4.0%; OR, 0.36; 95% CI, 0.20-0.63; P < .001). However, EVAR was also associated with a significant increase in late AAA-related mortality (2.2% vs 0.9%; OR, 2.25; 95% CI, 1.14-4.56; P = .03). There was no significant difference noted for total AAA-related mortality (3.5% vs 4.9%; OR, 0.73; 95% CI, 0.49-1.09; P = .13). EVAR was associated with a significant increase in graft-related complications (40.1% vs 10.5%; OR, 6.01; 95% CI, 4.59-7.89, P < .001), and secondary interventions (19.2% vs 10.1%; OR, 2.12; 95% CI, 1.67-2.69; P < .001).

Conclusions: In pooled analysis of the RCTs comparing EVAR and OPEN, EVAR has clear advantages of decreased early AAA-related mortality, but with increased early and late complications and the need for secondary interventions to further improve the long-term success of EVAR. Despite these issues, EVAR remains the procedure of choice in anatomically suitable AAA patients.

Totally Robotic Aortic Surgery versus Robotic-Assisted Aortic Surgery with Mini-Laparotomy
Judith C. Lin, MD, Sangye A. Kaul, MD, Akshar Bhandari, MD, James O. Peabody, MD, Mani Menon, MD, Henry Ford Hospital, Detroit, Mich.

Objectives: Safety and efficacy of totally laparoscopic aortic surgery and laparoscopic-assisted aortic surgery with mini laparotomy have been demonstrated in previous studies. Published reports of robotic-assisted aortic surgery involve a combination of laparoscopy for surgical access and robotic system for vascular reconstruction. The objective of this study is to determine the feasibility and advantage of a totally robotic aortic dissection and vascular reconstruction versus robotic-assisted aortic procedures for aortic aneurysmal disease (AAO) and abdominal aortic aneurysm (AAA).

Methods: From February 2006 to August 2010, 21 patients were selected for robotic aortic procedures: 12 had aortobifemoral bypass, 6 had AAA repairs, 1 had iliac aneurysm repair, and 2 had ligation of type II endoleak after endovascular aneurysm repair. Inclusion criteria included AAA > 5 cm, iliac aneurysm > 3 cm, and AIOD TransAtlantic InterSociety Consensus C or D. The daVinci S Surgical System was used for the aortic dissection in all cases and the aortic anastomosis in three. Institutional Review Board approval and informed consent were obtained.

Results: The 21 patients (6 women, 15 men) were an average age of 65.7 years (range, 44-86 years) and body mass index of 27.23 kg/m², and 90.4% were American Society of Anesthesiology 3 or 4. Twenty patients (95.2%) underwent successful robotic dissection of the abdominal aorta. One patient underwent conversion to open AAA repair due to trocar injury. Of the remaining 20 patients, the average robotic dissection of the infrarenal aorta was 113.1 minutes and average aortic clamp time was 86 minutes. Procedures in 15 patients were performed with a minilaparotomy using an average abdominal incision of 13 cm to implant the DaVinci S robotic platform.

Conclusions: In this selected group of patients, totally robotic aortic surgery for aortic dissection and vascular reconstruction is feasible. For aortic procedures completed totally robotically without an abdominal incision, the estimate blood loss was significantly less than robotic-assisted procedures with minilaparotomy.

Table. Totally robotic versus robotic-assisted aortic procedures

<table>
<thead>
<tr>
<th>Aortic clamp time (min)</th>
<th>Estimated blood loss (mL)</th>
<th>LOS (days)</th>
<th>Mini-incision (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total robotic</td>
<td>60</td>
<td>200</td>
<td>6.6</td>
</tr>
<tr>
<td>(n = 5)</td>
<td></td>
<td></td>
<td>None</td>
</tr>
<tr>
<td>Robotic-assisted</td>
<td>89.5</td>
<td>1474.4</td>
<td>11.7</td>
</tr>
<tr>
<td>(n = 15)</td>
<td></td>
<td></td>
<td>13</td>
</tr>
</tbody>
</table>

Outcomes of EVAR in Hemodynamically Stable and Unstable Patients with Ruptured AAA: A Prospective Analysis
Manish Mehta, MD, MPH, Scan P. Roddy, MD, Yaron Sternbach, MD, John B. Taggart, MD, Paul B. Kreienberg, MD, Philip 5.K. Paty, MD, Kathleen J. Oozvath, MD, Benjamin B. Chang, MD, Dhurai M. Shah, MD, R. Clement Darling III, MD, Albany Medical College/Albany Medical Center Hospital, Albany, NY.

Objectives: To date there are no published reports comparing hemodynamically (Hd) stable and Hd unstable patients with ruptured abdominal aortic aneurysms (r-AAA) undergoing endovascular aneurysm repair (EVAR). This study evaluated outcomes of EVAR for r-AAA based on patient hemodynamic status.

Methods: From 2002 to 2009, 106 patients with r-AAA were categorized into two groups based on systolic blood pressure (SBP) measurements before EVAR: Hd-stable (SBP ≥80 mm Hg; n = 72, 68%), and Hd-unstable (SBP <80 mm Hg; n = 34, 32%). All data were prospectively collected, and statistical analysis was performed using χ² square and life-table methods.

Results: Of the 106 r-AAA patients with EVAR, the Hd-stable and Hd-unstable groups had similar comorbidities (coronary artery disease: 63% vs 59%, hypertension: 72% vs 75%, chronic obstructive pulmonary disease: 21% vs. 26%, and chronic renal insufficiency: 18% vs 18%), the need for