

IP073.



TEVAR Indications and Outcomes for Patients With Type 2 Diabetes

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Objectives: Studies have been inconclusive on the role of diabetes in thoracic endovascular aortic repair (TEVAR). Some have even shown a paradoxical benefit of diabetes in postoperative complication rates. We analyzed the effect of type 2 diabetes on the indications and outcomes after TEVAR.

Methods: A retrospective review was performed of a single-institution, prospectively maintained database of TEVAR patients ranging from August 2001 to January 2020. Patients were divided into two cohorts: those with and without type 2 diabetes mellitus at TEVAR. The demographics, comorbidities, and perioperative information were compared between the two cohorts. The outcomes of in-hospital complications, endoleaks, reintervention, and 30-day mortality were compared via univariate and multivariate logistic regression (Table). Kaplan-Meier log-rank analysis was used to compare reintervention-free survival. The Society for Vascular Surgery guideline classifications were used to define complications (Fig).

Results: Among the 376 patients, 66 had had diabetes and 310 had not. Those with diabetes were older at surgery (72.7 vs 67.6 years; $P = .007$). Those with diabetes also had higher rates of a known abdominal aortic aneurysm history ($P = .003$), chronic obstructive pulmonary disease ($P = .020$), and coronary artery disease ($P = .002$). Those with diabetes had a higher percutaneous access rate than did the patients without diabetes ($P = .001$). On adjusted multivariate analysis, no significant differences were found in the outcomes of in-hospital complications, endoleaks, death, rates of reintervention, or days to discharge (Table). Kaplan-Meier curve survival analysis for reinterventions yielded no difference in reintervention-free survival (0.49; Fig).

Conclusions: Patients with diabetes undergoing TEVAR procedures were older and had a higher presence of a known abdominal aortic aneurysm history, chronic obstructive pulmonary disease, and coronary artery disease compared with the patients without diabetes. Despite the higher comorbidity burden for the patients with diabetes, no significant differences were found in complication or reintervention rates. The contrasting results of this study to others in the literature underscores the need for future research into the effects of diabetes and outcomes following endovascular surgery.

Table. Type 2 diabetes and thoracic endovascular aortic repair (TEVAR) outcomes

Diabetes	Univariate OR (95% CI)	P value	Multivariate OR (95% CI)	P value
Unplanned reoperation	0.64 (0.30-1.24)	.209	0.40 (0.09-1.33)	.171
In-hospital severe complications	2.04 (0.89-4.36)	.077	0.71 (0.09-3.42)	.701
Postoperative severe complications	1.31 (0.47-3.20)	.573	1.99 (0.45-7.97)	.335
Endoleak	1.14 (0.41-2.74)	.779	1.35 (0.25-6.13)	.702

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IP075.



Fixing Bridge Technique Combining Distal Covered Self-Expandable With Proximal Balloon-Expandable Stent-Graft in Case of Branched Endografting

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Objectives: The aim of the study was to describe the early and midterm results of the fixing bridge technique—a combination of a distal covered self-expandable with proximal balloon expandable stent graft—during branched thoracoabdominal aneurysm (TAAA) repair to limit the incidence of type IIIc endoleak (~2%).

Methods: Between October 2016 and October 2021, all TAAAs undergoing fenestrated and branched endografting (fenestrated and branched endovascular aneurysm repair) with Cook (Cook Medical Inc, Bloomington, IN) and Jotec (Jotec, Hechingen, Germany) platforms were collected in a dedicated database. Visceral arteries features (length, diameter, orientation) were analyzed on the basis of preoperative computed tomography scans using Aquarius software (TeraRecon, Inc, Durham, NC). In all cases, a self-expandable covered stent graft (Covera; BD Bard, Tempe, AZ; or Viabahn; W.L. Gore & Associates, Flagstaff, AZ) was used as bridge stent. In addition, proximal fixation using a balloon-expandable stent graft (E-ventus BX; Jotec) was performed. In six cases, the inferior mesenteric artery was preserved (using a parallel graft technique, iliac branch, or iliac leg released above the inferior mesenteric artery ostium). In nine cases, the TAAA was associated with obstructive disease of the iliac axis, and at least one hypogastric artery was preserved using an iliac branch (three cases) or a parallel graft technique (six cases). Follow-up was performed at 1 and 12 months with computed tomography and then annually. Aortic-related mortality, bridge stent occlusion, reinterventions, and branch instability were evaluated.

Results: For a total of 60 TAAAs undergoing fenestrated and branched endovascular aneurysm repair, 215 visceral vessels were targeted. The average follow-up was 12 months. In three cases, an intraoperative bridge stent occlusion was registered. In two cases, the occlusion was resolved using the Penumbra Indigo Aspiration System (Penumbra, Alameda, CA) and in one case using the AngioJet peripheral thrombectomy system (Boston Scientific, Marlborough, MA). At follow-up, aortic-related mortality was 0%, and freedom from branch instability and reintervention was 100%.

Conclusions: In the case of complex aortic procedures, the combination of a covered self-expandable stent graft proximally fixed with a covered balloon-expandable stent graft seems to be safe and feasible, with low rates of occlusion, reintervention, and branch instability at early

Figure 1: Type 2 Diabetes Unplanned Reintervention-Free Survival Kaplan-Meier Curve

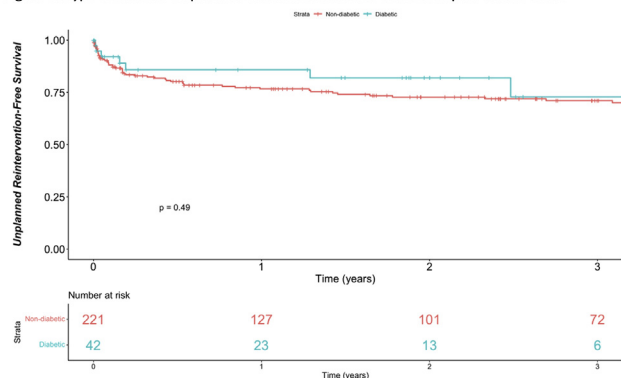


Fig. Kaplan-Meier curve for type 2 diabetes and unplanned reintervention-free survival.

and midterm follow-up. However, long-term follow-up is needed to assess the patency and instability of the bridge stents.

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IP077.



Management Trends and Outcomes of Ruptured Abdominal Aortic Aneurysms Over 20 Years

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Objectives: A ruptured abdominal aortic aneurysm (RAAA) is a surgical emergency that carries substantial morbidity and mortality. We reviewed our practice's experience with the management of RAAAs to assess the risk factors and evaluate the evolution of management over 20 years.

Methods: A retrospective review was performed of all patients with abdominal aortic aneurysms (AAAs), including infrarenal, juxtarenal, and suprarenal aneurysms, identified from administrative codes who had presented to our service. Clinical data were abstracted by medical record review. The data were analyzed using univariate and multivariable statistical methods.

Results: A total of 1038 AAA patients were treated between 2001 and 2021. Of these, 211 (20%) had presented with a RAAA. Ruptured had occurred in younger patients (70 vs 73 years; $P < .001$), who were more likely to present with back pain (29% vs 15%; $P < .0001$), abdominal pain (43% vs 7%; $P < .0001$), syncope (58% vs 17%; $P < .0001$), hypotension (91% vs 11%; $P < .0001$), an altered mental status (71% vs 19%; $P < .0001$), diaphoresis (86% vs 18%; $P < .0001$). The patients with a RAAA were more likely to be transfused (57% vs 5%; $P < .0001$), and 140 of the 211 patients (66%) had undergone open surgery ($P < .0001$). Although mycotic aneurysms were uncommon ($n = 14$), 8 of these 14 patients (57%) had presented with rupture ($P < .003$). Similarly, of 22 patients with atheromatous etiology, 13 (59%) had a RAAA ($P < .0001$). The overall 30-day mortality 6% (62 of 1038) in this cohort, and was 19% for those with a RAAA (40 of 211) and 3% (22 of 827) for those with a nonruptured AAA ($P < .0001$). Similarly, long-term survival at 5 and 10 years was 75% and 60% for those with an unruptured AAA and 60% and 48% for those with a RAAA, respectively ($P < .0001$). In the adjusted analyses, the primary risk factors for 30-day death were the glomerular filtration rate (odds ratio [OR], 0.97 per 1 mL/min/1.73 m²; $P < .0003$), a RAAA (OR, 2.8; $P < .008$), acute back pain (OR, 2.4; $P < .02$), and open surgery (OR, 3.5; $P < .002$). No effect of aortic size was observed on mortality, and rupture did not modify the effects of other risk factors. During the 20-year study, the proportion of cases performed endovascularly increased from 15% of the overall volume in the first 5 years to 90% in the last 5 years ($P < .0001$); however, RAAAs represented roughly one half the open repair volumes in the later years (Fig).

Conclusions: The presence of rupture and the use of an open approach remained strong risk factors for mortality, even after statistical adjustment. In our group's practice, at present, open surgery is mostly reserved for those with unstable ruptures and those with anatomic limitations. However, endovascular management of RAAAs has been demonstrated to become more feasible over time.

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Trends in Management of Ruptured AAA cases

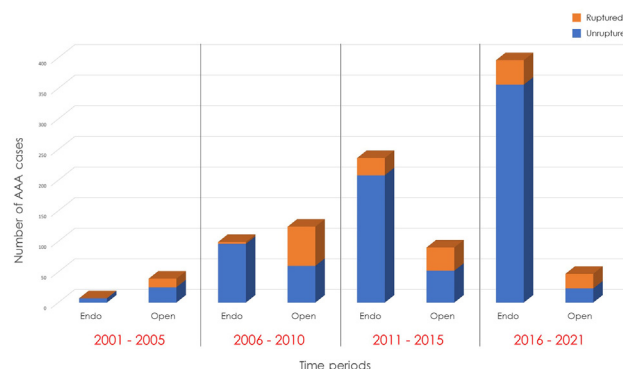


Fig 1.

IP079.



Factors Causing Lower Extremity Ischemia Requiring Intervention Following Elective Endovascular Aneurysm Repair

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Objectives: Limb thrombosis with the need for further lower extremity revascularization is a well-described complication after endovascular aneurysm repair (EVAR). The purpose of this study was to determine the factors causing lower extremity ischemia requiring intervention (LEIRI) after elective EVAR.

Methods: The American College of Surgeons' National Surgical Quality Improvement Program database was retrospectively analyzed for patients undergoing elective EVAR between 2015 and 2019 with commonly used devices (Cook Medical, Bloomington, IN; Medtronic, Dublin, Ireland; and W.L. Gore & Associates, Flagstaff, AZ). The factors causing LEIRI were assessed using univariate analysis (Mann-Whitney U , χ^2 , and t tests) and multivariate logistic regression analysis.

Results: A total of 6527 aneurysms were electively repaired using Cook, Medtronic, and Gore devices between 2015 and 2019 as per the National Surgical Quality Improvement Program database. The mean age was 73.58 ± 8.58 years, 749 (17.6%) were women, and 4705 (72.1%) were White. Of the 6527 aneurysms, 5874 (90%) had been treated because of a large diameter. The remaining indications included dissection, symptomatic, and embolization or thrombosis. Cook devices were used for 1440 (22.1%), Medtronic for 2059 (31.5%), and Gore for 3028 (46.4%). Of the 6527 patients, 98 (1.5%) had required LEIRI. Univariate analysis showed that male gender (68.4% of the LEIRI group vs 82.6% of the non-LEIRI group; $P = .000$), White race (59.2% vs 72.3%; $P = .003$), non-Hispanic ethnicity (64.3% vs 78.5%), and the use of the Gore Excluder device (30.6% vs 46.6%) were associated with a lower postoperative need for LEIRI. Intraoperative lower extremity revascularization (15.3% vs 3.3%; $P = .000$) and the use of adjunctive iliac stenting (26.5% vs 16.5%; $P = .008$) were associated with a greater need for LEIRI. Multivariate analysis showed that female gender (odds ratio [OR], 2.18; $P = .000$), lower extremity revascularization (OR, 4.12; $P = .024$), iliac stenting (OR, 1.71; $P = .024$), Medtronic device use (OR, 1.67; $P = .039$) were associated with a greater need for LEIRI.

Conclusions: Adjunctive iliac stenting, lower extremity revascularization, and the use of certain commercial devices were associated with an increased need for revascularization postoperatively. Further prospective research is imperative to determine the clinical significance of the effects of device type on limb patency.