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Differences in Readmissions After Open Repair versus EVAR

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Abstract

Objective—Reintervention rates are higher for endovascular aneurysm repair (EVAR) compared with open repair (OR) mostly due to treatment for endoleaks, while open surgical operations for bowel obstruction and abdominal hernias are higher following OR. However, readmission rates for non-operative conditions and complications that do not require an intervention following either EVAR or OR are not well documented. We sought to determine reasons for all-cause readmissions within the first year following open AAA repair and EVAR.

Methods—Patients who underwent elective AAA repair in California over a six-year period were identified from the Health Care and Utilization Project (HCUP) State Inpatient Database (SID). All patients who had a readmission in the state of California within one year of their index procedure were included for evaluation. Readmission rates as well as primary and secondary diagnoses associated with each readmission were analyzed and recorded.

Results—From 2003-2008, there were 15,736 operations for elective aneurysm repair, 9,356 EVARs (60%) and 6,380 open repairs (40%). Postoperatively, there was a 52.1% readmission rate after OR and a 55.4% readmission rate following EVAR at one year ($p=0.0003$). The three most common principle diagnoses associated with readmission after any type of AAA repair were failure to thrive, cardiac issues, and infection. When stratified by repair type, patients who underwent open repair were more likely to be readmitted with primary diagnoses associated with failure to thrive ($p<0.0001$), cardiac complications (p= NS), and infection (p= NS) compared to EVAR. Those who underwent EVAR were more likely, however, to be readmitted with primary diagnoses of device-related complications ($p=0.05$), cardiac complications, and infection.

Conclusion—Total readmission rates within one year of elective AAA repair are greater following EVAR than with open repair. Reasons for readmission vary between the two cohorts, but

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are related to the magnitude of open surgery following OR, device issues after EVAR, and the usual cardiac and infectious complications following either. Systems-based analysis of these causes of readmission can potentially improve patient expectations and care following elective aneurysm repair.

INTRODUCTION

Since it was first described in 1991, endovascular aneurysm repair (EVAR) has become the preferred method of treatment for patients with abdominal aortic aneurysms (AAA).[1] Early studies have documented well improvement in operative mortality and initial complication rates following EVAR.[2] However, longer-term followup has suggested that the early benefit of EVAR might be lost several years after surgery.[3] The reasons for the convergence of success rates are multifactorial, and often related to the high number of secondary interventions in the EVAR cohort. Second interventions are reported to be as high as 20% and have an increased morbidity and mortality in patients requiring them.[4] What remains challenging to track, however, and perhaps the reason for the scarcity of literature related to are non-operative readmissions. The importance of understanding all-cause readmissions, particularly non-operative causes, is highlighted in other surgical procedures where they increase the risk of future complications and subsequent mortality up to 11%.[5]

The purpose of this study was to use a statewide database to evaluate the incidence of all post-operative readmissions within one year following elective AAA repair in the state of California. The differences in these readmission rates between EVAR and open repair were compared, as well as the actual causes and diagnoses of readmissions between the two cohorts. Predictive demographic factors associated with readmission within one year of an elective AAA repair were examined to better understand systems-based issues surrounding readmission.

METHODS

The State Inpatient Database (SID) developed as part of the Healthcare Cost and Utilization Project (HCUP), sponsored by the Agency for Healthcare Research and Quality, identified adults who underwent open repair or endovascular repair of infrarenal AAA between 2003 and 2008. Patients were identified using International Classification of Diseases, Ninth Revision (ICD-9) diagnosis codes for intact AAA (441.4, 441.9). For the purpose of this study, we excluded patients identified with ICD-9 codes for ruptured AAA (441.3, 441.5). Extremes of age were also considered likely outliers, so inclusion criteria for this study was limited to those between 40-90. Patients were then subdivided according to International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure codes, 38.44 for open repair and 39.71 for endovascular repair. All patients at risk for one-year readmission following elective AAA repair were included in this study.

The SID contains a range of data collected from discharge inpatient hospital records including demographics, ICD-9-CM codes for primary and secondary diagnoses and procedures, admission source, length of stay, discharge disposition, inpatient mortality, and hospital characteristics. This database also allows for identification of patient readmissions within one full year in the state of CA. It attempts to capture patient data characteristics from the readmission, including primary and secondary diagnoses. Multiple readmissions from the same patient within one year counted toward the total number of readmissions for that cohort.

For purposes of analysis, patient race was categorized as white or non-white. Patients' primary expected payer was categorized as private, Medicare, Medicaid, or other. Comorbidity illnesses present on the index admission were summarized using the Charlson Index, which considers co-morbid conditions as predictors of ten-year mortality. To perform a longitudinal analysis, unique patient identifiers were used to determine whether a single patient had a subsequent hospital admission within the subsequent year. Patient identifiers were not consistent across years and therefore prevented analysis of patients across multiple years.

Because multiple types of codes exist for all types of readmissions, and to create more broad categories of reasons for readmission, we arbitrarily divided principle and secondary diagnoses into systems-based problems, and included several different conditions under one larger medical diagnosis (Table 1). For instance, readmission diagnoses documented as pneumonia organism not otherwise specified (NOS) (486), respiratory failure (51881), obstructive chronic bronchitis with active exacerbation (49121), food/vomit pneumonitis (5070), post-traumatic pulmonary insufficiency (5185) and surgical complication: respiratory system (9972) were combined to create "pulmonary" classification for reason for readmission.

We analyzed the 41 most frequent diagnoses and included these in follow-up evaluation. This captured over 95% of the patients with readmissions, and clear outliers, those diagnoses that were clearly unrelated to a patient's aneurysm repair, were excluded. These were infrequent and were almost exclusively related to malignancies.

Statistical Analysis

Both SAS (version 9.2) and Stata (version 11) software were used for statistical analyses. Chi-square analysis and t-test were used to compare outcome variables as appropriate. Overall readmission rates were estimated using Kaplan-Meier analysis. Comparison of these estimates by surgical type was performed using the log-rank test. A modified Cox proportional hazards modeling with adjustment for patient and hospital characteristics was used to adjust for patient mix on readmission rates between the two surgical procedures. Patient characteristics included age, gender, race, insurance status, obesity, complicated diabetes mellitus (DM), complicated hypertension (HTN), peripheral vascular disease, (PVD), chronic obstructive pulmonary disease (COPD), and end stage renal disease (ESRD).

RESULTS

Between 2003 and 2008, there were 17,749 AAAs treated in the state of CA. 1,648 (9.2%) ruptured AAAs were excluded from this analysis. This left 16,101 elective AAA repairs performed over this period. 365 patients were further excluded for various reasons, including extremes of age, incomplete or omitted data, or inconsistent information from the subsequent follow-up period. The remaining 15,736 patients had elective AAA repairs performed during the study period. 9,356 (59.5%) of these patients had an EVAR while 6,380 (40.5%) had an open repair.

Analysis of the annual trends between EVAR and open repair revealed an increase in the total number of elective aneurysm repairs performed from 2003-2008 (Figure 1). In 2003, 2,475 elective AAA repairs were performed. By 2008, this number had increased to 2,701. There existed a gradual but consistent increase in the number of EVARs performed (1,052 in 2003 to 2,023 in 2008) and a corresponding decrease in the number of elective open repairs performed (1,423 to 678).

The baseline demographics between the two populations were heterogeneous (Table 2). The mean age of patients undergoing EVAR was 75 years, compared with open repair, which was 72 years (p<0.0001). There was also a larger percentage of male patients in the EVAR group compared with the open repair group (84.7% vs. 75.6%, p<0.0001). Patients who had an EVAR were more likely to have complicated DM, while patients having an open repair were more likely to have complicated HTN, COPD, and have private insurance compared with Medicaid or Medicare. Patients undergoing an open repair had a higher Charlson Index score and more likely to have a score greater than or equal to 2 (55.52% for open repair vs. 51.73% for EVAR, P<0.0001). There was no difference between the two groups with respect to race, obesity, PVD, or ESRD.

Surgical outcomes

The overall operative mortality for all elective AAA repairs in the state of CA during the study period was 3.5%. This was significantly higher following open repair than with EVAR (6.7% vs. 1.4%, P<0.0001). The mean length of stay (LOS) at the surgical hospitalization was also significantly higher following open repair (10.5 days vs. 3.7 days, P<0.0001). Early readmission rates (within 30 days of surgery) also were higher for the open surgery group (20.0% vs. 17.4%, P=0.0003). Patients were more likely to be discharged as a routine disposition (i.e. not to a nursing facility or rehab center) following EVAR (84.3% vs. 57.7%, P <0.0001).

Readmissions

Patients were evaluated for readmissions to an inpatient hospital within one year of their index admission (Table 3). In contrast to early readmission rates, the 90-day readmission rates were only slightly greater following open repair (31.3% vs. 29.7%), but this did reach statistical significance (P=0.046). However, by one year from surgery there was a significantly higher readmission rate following EVAR compared with open repair (55.4% vs. 52.1%, P=0.0003). The mean number of days to the first readmission was significantly longer after EVAR (83 days vs. 57 days, P<0.0001) and the mean length of stay during the first readmission was significantly shorter with EVAR (2 days vs. 8 days, P<0.0001). At one year, the risk adjusted mortality was significantly greater for open repair (7.79% vs. 2.44%, P<0.0001). However, this significance was lost after the hospitalization for the surgical procedure was removed from the analysis. The adjusted mortality at one year excluding the index admission was 1.08% for EVAR and 1.24% for open repair (P=0.37).

Kaplan-Meier analysis confirmed similar outcomes at one year for the two cohorts (Figure 2). Early in the post-operative period, patients undergoing open repair were more likely to be readmitted to the hospital. This advantage, however, was lost by approximately four months following the procedure. At one year following the surgical procedure, patients who had undergone EVAR were more likely to be readmitted (P=0.009). Diagnoses associated with readmissions were evaluated between the two groups. When all diagnoses were considered, there were a greater number of diagnoses associated with readmissions within one year following open repair (Table 4). Specifically, patients who had open repair were more likely to be readmitted within one year with diagnoses of failure to thrive, cardiac, pulmonary, or gastrointestinal complications, infection, pulmonary embolism/deep venous thrombosis (PE/DVT), and small bowel obstruction (SBO). Patients who underwent elective EVAR were more likely to be readmitted within the first year for device or aneurysm-related complications. They were also slightly more likely to be readmitted with a diagnosis of a wound complication, although this was not statistically significant (P=0.12).

The primary diagnoses associated with readmission were also evaluated to see if this was different than considering all diagnoses during readmission. Once again the most common primary diagnoses for readmission for both groups were failure to thrive, cardiac complications, and infection (Table 5). The difference was statistically higher in open repair compared with EVAR (11.63% vs. 3.97%, $P<0.0001$); however, it was not significant in the latter two. Other statistically significant diagnoses associated with readmission following open repair included pulmonary complications (4.9%, P=0.009), gastrointestinal complications (3.8%, $P< 0.0001$), PE/DVT (0.54%, P=0.03), and SBO (1.1%, $P<0.0001$). Patients who had an EVAR were more likely to be readmitted with a primary diagnosis of wound complications (2.9%, P=0.02) and device/aneurysm-related complications, although this did not reach statistical significance (5.5%, P=0.055).

Cox-regression analysis revealed factors more likely associated with readmission within one year for all patients in the cohort (Table 6). Open repair was a negative predictor for readmission (HR 0.862, CI= 0.804-0.924). Females were more likely to be readmitted, as were older patients and patients with more comorbidities as measured by Charlson Index. Other predictors of readmission within one year included Medicaid insurance, increased LOS at surgery, CHF, and complicated HTN. Peripheral vascular disease conferred a protective advantage against readmission (0.675, CI= 0.536-0.851). Race, DM, and COPD were not associated with an increased risk of readmission within the first year following their surgical procedure.

DISCUSSION

Multiple randomized and nonrandomized controlled trials have demonstrated an early morbidity and mortality advantage following EVAR compared with open repair of elective AAA repair.[6,7,8] Interestingly, when pooled trial data has been compared for high risk patients this early advantage was not confirmed.[9] Similarly, most large studies demonstrated no survival advantage when longer follow-up was performed.[2,6] There still remains some doubt in the literature the exact reasons for loss of the survival advantage with longer-term followup, and may simply represent the comorbid cardiovascular factors of many patients undergoing elective aneurysm repair, whether open or EVAR.

Our goal in this study was to use an administrative database to identify all patients in the state of California who underwent elective AAA repair and track their readmissions through the first year. Early mortality outcomes are in agreement with other studies, with operative mortality of 1.4% following EVAR and 6.7% following open repair, comparable to those found in the DREAM trial[2] (1.7% and 6%, respectively). Because the patient cohorts in this current study were not homogenous, this likely had an impact on overall patient outcomes, and is an acknowledged issue with administrative databases. We found in the state of California that patients who had EVAR were more likely to be older, male, and less likely to have private insurance. However, patients undergoing open repair were more likely to be sicker with more comorbidities. The mean Charlson Index value for patients with an open repair was significantly higher than EVAR (1.72 vs. 1.67, $P<0.0001$). Patients with open repair were more likely to have a history of CHF, complicated diabetes mellitus, and complicated hypertension. This selection bias of offering healthier patients EVAR may explain in part the increased early mortality following open repair in the state of California.

Analysis of the readmission data, the focus of this study, highlights some interesting factors about this cohort. First, readmission rates of 55.4% and 52.1% within one year following the two procedures seemed excessive at first glance. While not every one of these subsequent admissions can be directly related to the patients' aneurysm repairs, it underscores the fact that patients with aneurysmal disease mostly have significant comorbidities and are of the age that return to the hospital at a surprisingly high rate in the first year following their surgery. It is plausible that the true incidence of readmissions is often underreported, albeit a number of them not necessarily as a direct result of the surgical procedure. A patient may present to an outside institution or even to a different service within the same hospital. Often these readmissions will not be viewed as a consequence of the initial procedure, and often goes unbeknownst to the original surgeon. One of the strengths of the particular database used in this study is it captures readmissions within the entire state, so much less likely to underestimate true readmission rates.

Obviously, when combining readmission diagnoses, the current data suggests that a significant percentage of readmissions are related to the original operation. Admission diagnoses coded as primary during readmission include failure to thrive and cardiac complications, and were significantly higher in the open group, highlighting the more invasive nature and a predictably more difficult recovery process. This assertion is supported by a longer length of stay at the initial hospitalization, fewer number of days to the first readmission, and a longer length of stay at readmission. Second, it also suggests that in the state of California that sicker patients had an open repair, as documented by a larger percentage of patients who had CHF, COPD, and a higher Charlson Index score having OR over EVAR. This clearly documents the evolution and ultimate preference of EVAR to now replace open repair in the uncomplicated aneurysm patient. Finally, given the preference towards EVAR, more challenging anatomy patients are likely undergoing open repair, potentially with suprarenal clamping, which is also making the operations longer, more challenging, and potentially with worse early results. These factors may have certainly then contribute to a longer and more challenging post-operative course, increasing early readmission rates.

It is not a surprise that in state of California that early operative outcomes favor EVAR. In addition to the improved mortality, EVAR had a lower 30-day readmission rate, longer time to the first readmission, and shorter hospitalization at that first readmission. This is a comparable result to the VA population, where in a review of over forty-five thousand patients who underwent elective AAA repair, Bush *et al.* found a significantly lower 30-day mortality and complication rate following EVAR. The median length of stay was shorter for EVAR both in the ICU (1 day vs. 4 days) as well the hospital (3 days vs. 7 days).[10] What focusing on early outcomes fails to discover, however is the readmission rates. Despite the greater number of overall readmission diagnoses associated with open repair early on in the initial postoperative recovery, by four months following surgery there was crossover where now EVAR readmssions overtook This trend continued and became statistically significant at one year and beyond. Open repair actually conferred an advantage against readmission compared with EVAR (OR= 0.862) at the one-year point, a seemingly counterintuitive finding. Kaplan-Meier analysis documents this (Figure 2), demonstrating fairly parallel lines between the two groups with respect to readmission rates after the first 120 days. Furthermore, the significantly higher 1-year mortality rate for OR can largely be contributed to the greater number of deaths at the surgical hospitalization. Once this hospitalization was removed from the analysis, the predicted one year mortality rate for EVAR was 1.08% and for open repair was 1.24%, which was not statistically significant (P=0.372).

When looking at readmission rates, the use of the HCUP SID allowed us to track patients by index hospitalization as well as all subsequent readmissions within the first year of surgery. To improve the precision of the causes for readmission we compared both all diagnoses as well as only primary diagnoses. The most common primary diagnoses associated with readmissions following either cohort were failure to thrive, cardiac complications, and infection. However, at 11.63%, only failure to thrive was significantly higher in the open group. Cardiac complications and infection were similar between the two groups. This was despite the significantly higher number of patients in the open repair group who had CHF. The significant number of readmissions associated with primary diagnoses of cardiac complications and infection is not surprising given the age of the population and baseline comorbidities. Other studies have demonstrated similar results. [11,12,13] There were also a significant number of patients with COPD at baseline in this study (29.2% in the EVAR and 37.7% in the open repair group). The link between tobacco use as well as aneurysm formation and growth is well documented.[14] Interestingly, this seemed to predict a higher number of subsequent pulmonary readmissions in the open repair group only, arguing that EVAR is reasonable in the patient with significant pulmonary comorbidities.

One surprising finding is the wound complication readmission rate following EVAR. We anticipated that wound issues would be greater following OR, as has been found in previous studies, where laparotomy related complications have been reported to be as high as 23% in other surgical cohorts,[15] compared with as low as 2% following open femoral access.[16,17] However, this was not replicated in our cohort analysis. This suggests that focusing on lower-profile devices or more percutaneous access might further improve readmission rates after EVAR.[18] Although incisional hernia was included in the category of wound complication readmission, it is probable that many of these do not develop or are evaluated until greater than one year following surgery.

Finally, focusing on predictors of readmission may help with system-based approaches towards improving outcomes after aneurysm repair. In this study, for all types of aneurysm repair, predictors of readmission within the first year for either type of repair include female gender (HR= 1.09), older age (HR= 1.01), and those patients with Medicaid insurance (HR= 1.22). Not surprisingly patients who are sicker (Charlson index 2 and 3) and those patients with an increased length of stay during their hospitalization were also at a greater risk of readmission within the first year. These risk factors should also be incorporated into pre-operative discussions about realistic expectations as to the function and quality-of-life after aneurysm repair, whether open or EVAR.

There are obvious limitations to this database analysis, and issues with administrative databases are acknowledged and well-documented in the literature. Miscoded events and incomplete coding are not uncommon events during hospitalizations and can account for a certain amount of error in this study. Principle diagnoses tend to be accurate; however, secondary diagnoses and comorbid diagnoses are often underreported. Furthermore, actual causes of readmission using a database of this sort can be difficult to identify due to accurate reasoning by the abstractor of the billing versus what the physician determines, and can make analysis challenging. Also the admission may or may not even be related to the actual surgery, for example, being admitted with a heart attack 9 months after surgery may have happened with a procedure or not. Finally, there is no way to know the number of patients who were readmitted to hospitals outside of the state of California. We still feel this particular database analysis is useful in determining relatively accurate readmission rates and causes after aneurysm repair.

CONCLUSION

In summary, total readmission rates within one year of elective AAA repair are greater following EVAR compared with open repair. Reasons for readmissions vary between the two cohorts. Further prospective studies should be performed to confirm those patients that are at increased risk of readmission following elective AAA repair. In addition, systems-based analysis of these causes of readmission can potentially improve patient expectations and care following elective aneurysm repair.

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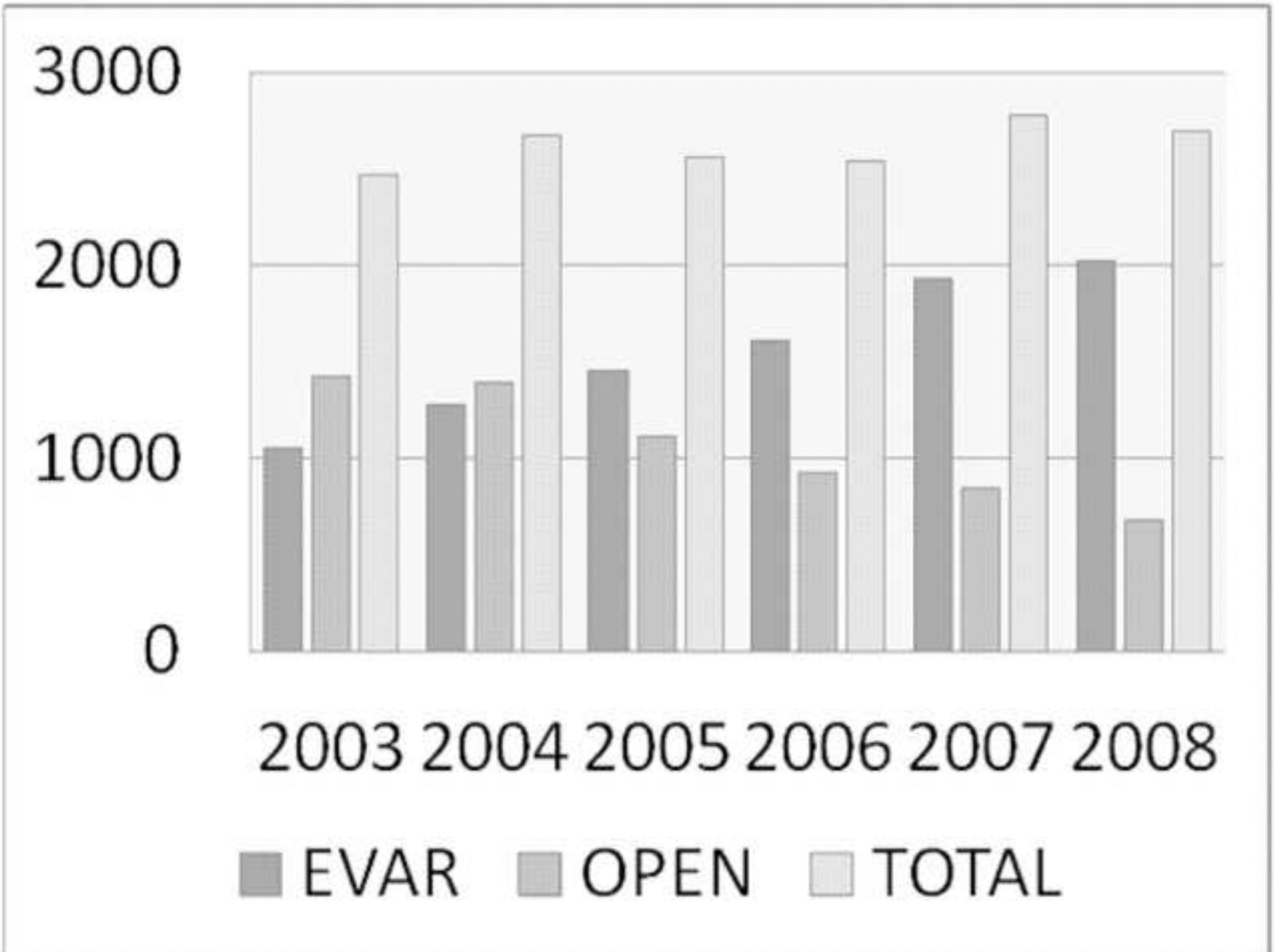

Figure 1.

Over the course of the study period (2003-2008), the number of total aneurysms repaired in the State of California has remained relatively constant. Endovascular repair (EVAR) has, however, replaced OPEN repair as the treatment method of choice.

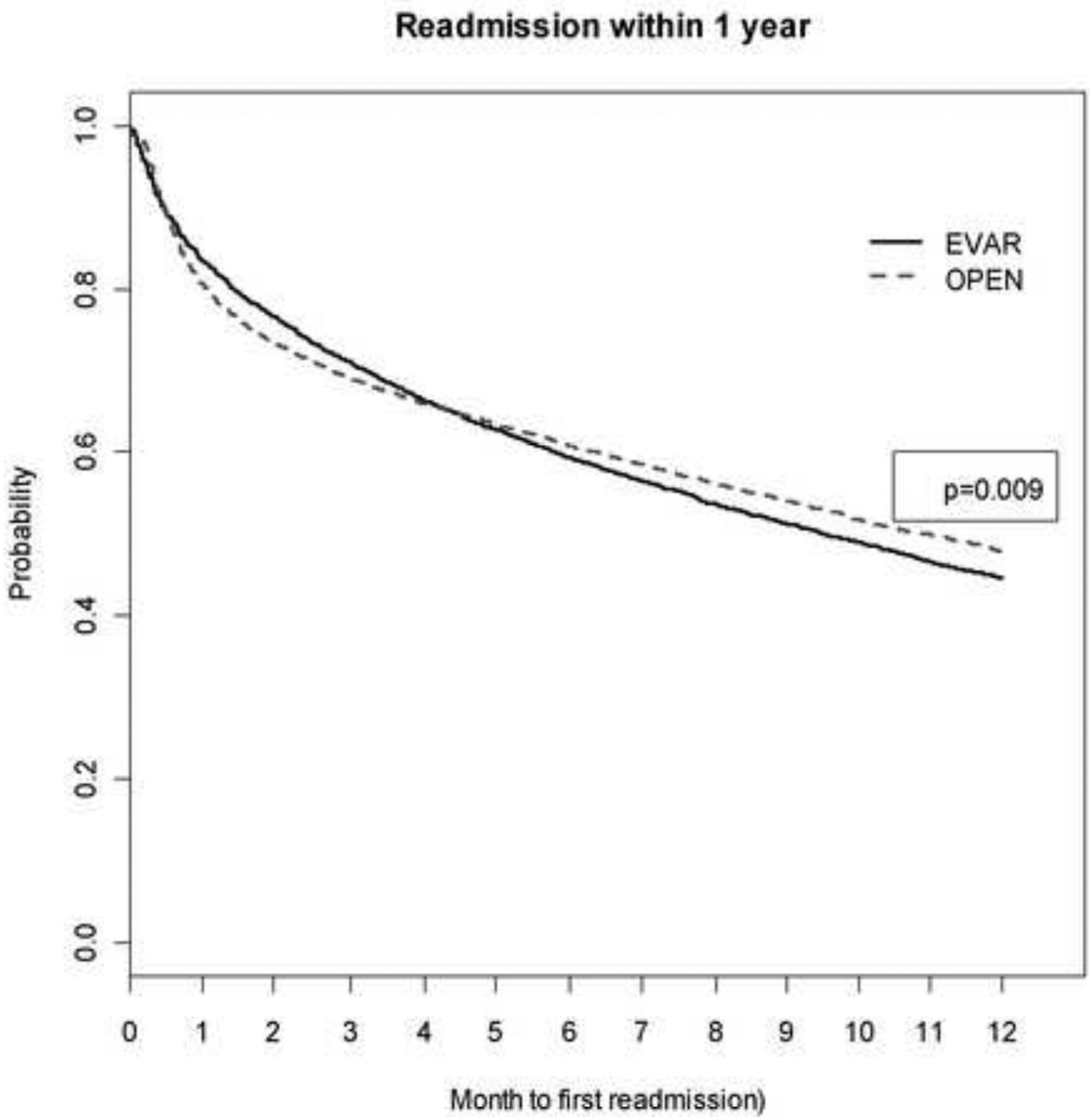

Figure 2.

Kaplan-Meier estimates of freedom from readmission. At one-year followup patients undergoing endovascular repair have a higher likelihood of readmission compared to open repair.

Table 1

Specific ICD-9 diagnostic codes used to categorize readmission causes into groups of system-based criteria.

Failure to thrive	V5789	Rehabilitation procedure nec	**DVT/PE**	4538	Venous thrombosis nec	**Distal embolization**	44422	Lower extre
	V5873	Aftercare following surgery/ circulatory system-nec		41519	Other pulmonary embolism, infarct	**Device/Aneurysm-related**	4414	Abdominal
	V571	Physical therapy nec	**Pulmonary**	486	Pneumonia-organism NOS		99674	Complicatio vascular dev
	V5849	Other postoperative aftercare		51881	Respiratory failure		99662	React- other device/graft
	2765	Hypovolemia		49121	Obstructive chronic bronchitis with active exacerbation		9972	Surgical cor vascular sys
	27651	Dehydration		5070	Food/vomit pneumonitis			
Cardiac	4280	Congestive heart failure		5185	Post traumatic pulmonary insufficiency			
	41401	Coronary atherosclerosis native vessel		9972	Surgical complication: respiratory system			
	41071	Subendothelial infarct: initial	**GI**	9974	Surgical complication: GI tract			
	42731	Atrial fibrillation		5770	Acute pancreatitis			
	78659	Chest pain nec		00845	Clostridium difficile infection			
	42781	Sinoatrial node dysfunction	**SBO**	56081	Intestinal adhesion with obstruction			
	78650	Chest pain NOS		5609	Intestinal obstruction NOS			
Infection	99859	Other postoperative infection	**Renal**	5849	Acute renal failure NOS			
	0389	Septicemia NOS	**CVA**	43491	Cerebral arterial occlusion NOS with infarction			
	5990	Urinary tract infection NOS	**Wound**	55321	Incisional hernia			
	03811	Staph aureus septicemia		99813	Seroma procedure culture			
				99831	Disruption of internal operative wound			

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Table 2

Comparison of baseline demographics and comorbidities of all patients in the State of California undergoing aneurysm repair from 2003-2008.

	EVAR	OR	p-value
Age (y)	75	72	<0.0001
Male Gender (%)	84.7	75.6	<0.0001
White Race (%)	81.1	81.5	NS
Private Insurance (%)	15.3	20.8	<0.0001
Charlson Index ≥ 2 (%)	51.7	55.5	<0.0001
Obesity (%)	7.2	7.0	NS
CHF	9.8	14.1	<0.0001
Complicated DM (%)	1.7	1.2	0.01
Complicated HTN (%)	9.0	10.9	0.0001
PVD (%)	98.8	98.5	NS
COPD (%)	29.2	37.7	<0.0001
ESRD (%)	8.6	9.1	NS

Table 3

Readmission data of patients undergoing endovascular repair or open repair.

	EVAR (%)	OPEN (%)	p-value
Readmission within 30 days	17.4	20.0	0.0003
Readmission within 90 days	29.7	31.3	0.046
Readmission within 1 year	55.4	52.1	0.0003
Days to readmission	83	57	<0.0001
LOS at first readmission*	2	8	<0.0001
1- year risk adjusted mortality*	2.44%	7.79%	<0.0001
Adjusted mortality after index admission	1.08%	1.24%	0.373

Table 4

All diagnoses associated with readmission within one year after aneurysm repair.

	EVAR (%)	OPEN (%)	p-value
Failure to thrive	19.7	28.4	<0.0001
Cardiac	34.9	39.7	<0.0001
Infection	15.7	19.2	0.0001
Device/aneurysm	12.6	10.4	0.0059
Pulmonary	9.8	13.3	<0.0001
Renal	8.9	9.6	NS
CVA	1.8	1.8	NS
GI	2.6	7.2	<0.0001
Wound	5.2	4.4	NS
Embolism	0.9	1.0	NS
PE/DVT	0.4	0.9	0.006
SBO	0.3	1.4	<0.0001

Table 5

Primary diagnosis listed per readmission within one year after aneurysm repair.

	EVAR (%)	OPEN (%)	p-value
Failure to thrive	3.97	11.63	<0.0001
Cardiac	8.61	7.81	NS
Infection	6.84	7.09	NS
Device/aneurysm	5.54	4.50	0.055
Pulmonary	3.62	4.90	0.009
Renal	1.45	1.22	NS
CVA	1.45	1.19	NS
GI	1.20	3.85	<0.0001
Wound	2.89	1.98	0.02
Embolism	0.25	0.22	NS
PE/DVT	0.22	0.54	0.03
SBO	0.22	1.12	<0.0001

Table 6

Predictors of readmission within one year after aneurysm repair.

Factor	Hazard ratio	LCI	UCI	P-value
Open Repair	0.862	0.804	0.924	<0.0001
Female	1.091	1.005	1.184	0.0066
Age	1.012	1.008	1.017	<0.0001
Charlson Index 2	1.358	0.913	2.022	0.0473
Charlson Index 3	1.656	1.106	2.481	0.0013
Medicaid	1.220	0.986	1.508	0.0159
LOS	1.014	1.011	1.017	<0.0001
CHF	1.324	1.205	1.455	<0.0001
HTN	1.306	1.205	1.415	<0.0001
PVD	0.675	0.536	0.851	0.0009