

POSTER PRESENTATION

SURVIVAL, SHORT AND LONG-TERM OUTCOMES OF OPEN AND ENDOVASCULAR SURGICAL REPAIR OF UNRUPTURED INFRARENAL ABDOMINAL AORTIC ANEURYSMS.

W Samir Cubas MD MSc, Ludwig Cáceres-Farfán MD, Miguel Rojas-Huillca MD, Milagros Moreno-Loaiza MD, Franco Albán MD, Anna Paredes MD, Milagros Salazar-Cuizano MD, Félix Tipacti-Rodríguez MD, Julio Huayllara-Reduzzi MD y Johnny Mayta-Rodríguez MD.

INTRODUCTION

Endovascular Aortic Repair (EVAR) has become the standard management of Unruptured Infrarenal Abdominal Aortic Aneurysm (UIAAA); however, current evidence is limited and uncertain when compared to Open repair. Our study aimed to determine the survival, short and long-term outcomes of EVAR vs. Open in a Peruvian cohort of UIAAA.

Table 01. Baseline and clinical characteristics of the UIAAA study population.

CHARACTERISTICS	UIAAA TREATMENT (N=251)				p
	OPEN N=205 %=81.67		EVAR N=46 %=18.33		
Age (Years), Average (IQR)	73 (65.2-77.8)		76 (69.8-79.3)		0.057
Gender					
Male	143	69.75	31	67.39	0.089
Female	62	30.25	15	32.61	
Race					
Mestizo	157	76.58	35	76.08	
White	31	15.12	7	15.21	0.167
Black	12	5.85	3	6.52	
Other	5	2.45	2	2.19	
BMI (kg/m ²)					
<18.5 (Desnutrition)	15	7.31	5	10.86	0.046
≥ 30 (Obesity)	78	38.04	19	41.30	
Preoperative medication					
Statins	165	80.48	32	69.56	
Aspirin	149	72.68	29	63.04	0.092
Corticosteroids	54	26.34	12	26.08	
Smoking	138	67.31	14	30.43	0.021
Family history of AAA	39	19.30	11	23.91	0.032
Previous abdominal surgery	31	15.12	22	47.82	0.004
Comorbidities					
Diabetes Mellitus 2	97	47.31	24	52.17	
Hypertension	81	39.51	15	32.60	
Dyslipidemia	49	23.90	18	39.13	0.079
COPD	56	27.31	15	32.60	
AMI	34	16.58	11	23.91	
GFR <30 ml/min	29	14.14	10	21.73	
Stroke	18	8.78	12	26.08	
Diameter UIAAA (mm)					
<65 mm	71	34.63	11	23.91	0.021
>65 mm	134	65.37	35	76.09	
Distal aneurysmal extension					
Aortic	96	46.82	24	52.17	
Common Iliac	72	35.12	18	39.13	0.090
External and internal iliac	37	18.06	4	8.7	
Estimated mortality (VOI)	2.21% (1.94-2.89)		1.65% (1.15-1.99)		0.075

IRQ= Interquartile Range; BMI= Body Mass Index; AAA= Abdominal Aortic Aneurysm; COPD= Chronic Obstructive Pulmonary Disease; AMI= Acute Myocardial Infarction; GFR= Glomerular Filtration Rate; UIAAA= Unruptured Infrarenal Abdominal Aortic Aneurysm; VQI= Vascular Quality Initiative.

Table 02. Short- and Long-Term outcomes of UIAAA patients treated with open approach and EVAR.

OUTCOMES	UIAAA TREATMENT (N=251)				p
	OPEN N=205 %=81.67		EVAR N=46 %=18.33		
SHORT-TERM (<30 Days)					
Perioperative mortality	6	2.92	0	0	0.039
Blood transfusion (>4 Units)	189	72.68	8	17.39	0.021
Hospital Stay (Days), Mean (IRQ)	14 (11.5-16.2)		5 (3.9-8.2)		0.049
ICU stay >48 hours	56	27.31	8	17.39	0.028
Complications					
Pneumonia	42	20.48	9	19.56	0.188
Reintervention					
Postoperative bleeding	13	6.34	1	2.17	
Aneurysmal rupture	0	0	2	4.34	0.049
Endoleak	0	0	5	10.86	
AMI	14	6.82	2	4.34	0.078
Cardiac arrest	9	4.39	1	2.17	0.190
Acute renal dysfunction					
Increased Cr >2 mg/dl	89	43.41	7	15.21	0.028
Hemodialysis	24	11.70	4	8.69	
SSI	7	3.41	1	2.17	0.102
Septic shock	4	1.95	0	0	0.890
Hypovolemic shock	7	3.41	2	4.34	0.134
Ischemic colitis	11	5.36	1	2.17	0.067
Stroke	12	5.85	3	6.52	0.083
Lower limb ischemia	4	1.95	1	2.17	0.205
Venous thrombosis and pulmonary Embolism	14	6.82	4	8.69	0.271
Urinary tract infection	32	15.60	2	4.34	0.039
Postoperative Delirium	15	7.31	3	6.52	0.876
LONG-TERM (30 DAYS-5 YEARS)					
Late mortality	7	3.41	9	19.56	0.047
Complications					
UIAAA rupture	0	0	6	13.04	0.032
Endoleak					
IA	0	0	9	19.56	
IB	0	0	2	4.34	
IIA	0	0	2	4.34	0.048
IIB	0	0	1	2.17	
V	0	0	1	2.17	
Reintervention	5	2.43	5	10.86	0.002
Graft and endoprosthesis infection	2	0.9	0	0	0.140
Stroke	5	2.43	3	6.52	0.107
CKD	13	6.34	5	10.86	0.231

IRQ= Interquartile Range; ICU= Intensive Care Unit; AMI= Acute Myocardial Infarction; SSI= Surgical Site Infection; UIAAA= Unruptured Infrarenal Abdominal Aortic Aneurysm; CKD= Chronic Kidney Disease.

METHODS

A single-center observational, analytical, longitudinal study using a retrospective registry of 251 patients treated (EVAR=205 vs. Open=46) for UIAAA during 2000-2017. Variables considered were baseline, comorbidities, clinical-surgical, type of treatment, short-term (<30 days) and long-term (<5 years) outcomes, postoperative mortality according to the Vascular Quality Initiative (VQI) Risk Score, survival curves including reoperation-free rate and according to size (<65 mm vs. >65 mm) of long-term UIAAA. All variables were grouped according to the treatment performed (EVAR vs. Open) and compared with descriptive, multivariate, Cox regression, and Kaplan-Meier survival statistical analyses.

Figure 01. 5-years survival of patients with UIAAA treated Open and EVAR according to Kaplan-Meier analysis.

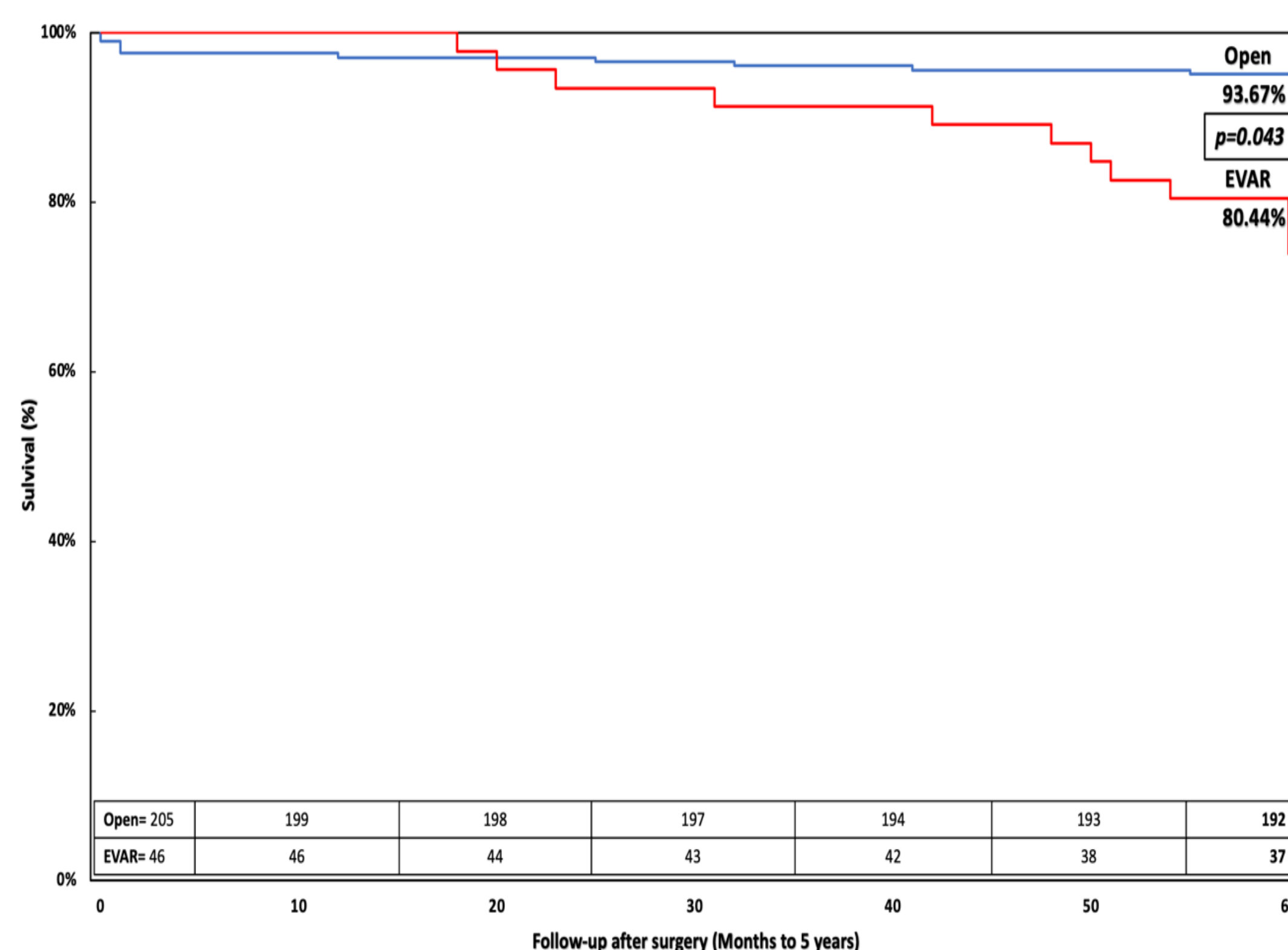
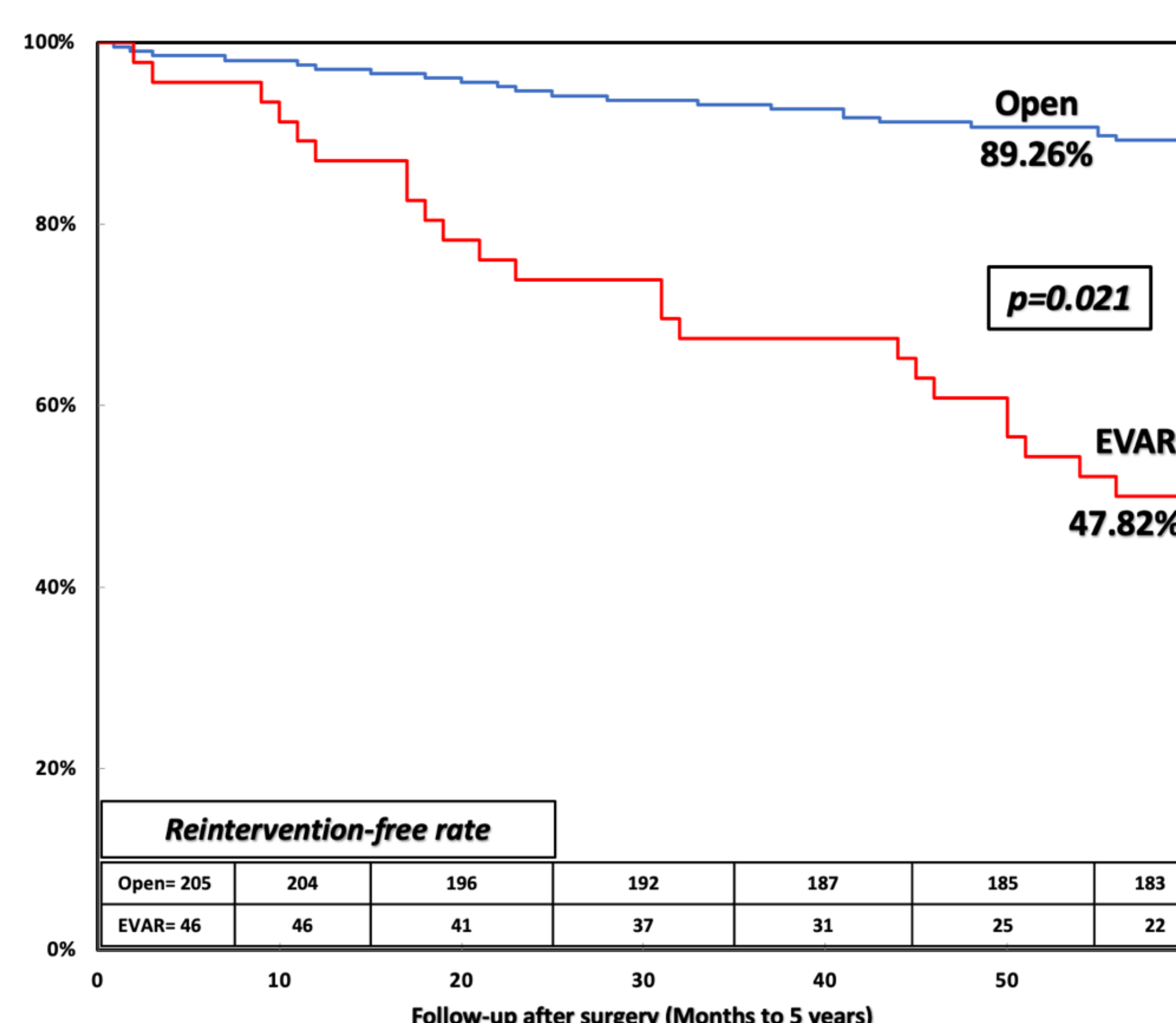


Figure 01. 5-year freedom from reintervention rate of UIAAA treated Open and EVAR according to Kaplan-Meier analysis.



RESULTS

The mean age was 74.5 years, and smoking, family members with UIAAA, and previous abdominal surgery were the main antecedents. Diabetes mellitus 2 was the main comorbidity, and more than 50% of patients with UIAAA had diameters greater than 65 mm (p=0.021). The calculated mortality (VQI) was Open=2.21% vs. EVAR=1.65%. In short-term outcomes, mortality (Open=2.92% vs. EVAR=0%; p=0.039), blood transfusion (Open=72.68% vs. EVAR=17.39%; p=0.021) and overall hospital stay (Open=14 vs. EVAR=5 days; p=0.049). A 24% reduction in mortality (HR 0.76, 95% CI, 0.62-0.96, p=0.045) and 19% reduction in readmission for aneurysmal rupture was identified for EVAR (HR 0.81, 95% CI, 0.79-0.85, p=0.031). In long-term outcomes, mortality (Open=3.41% vs. EVAR=19.56%; p=0.047), aneurysmal rupture (Open=0% vs. EVAR 13.04%; p=0.032) and reinterventions (Open=2.43% vs. EVAR=10.86%; p=0.002). An 86% risk of mortality (HR 1.86, 95% CI, 1.32-2.38, p=0.039) and 121% risk of readmission for aneurysmal rupture was identified for EVAR (HR 2.21, 95% CI, 1.98-2.45, p=0.028) (Table 01). At 5 years, survival for Open=93.67% vs. EVAR=80.44% (p=0.043), reintervention free rate for Open=89.26% vs. EVAR=47.82% (p=0.021), survival for treated UIAAA <65 mm for Open=95.77% vs. EVAR=63.63% (p=0.019) and >65 mm for Open=92.53% vs. EVAR=85.71% (p=0.059) (Figure 01-02).

CONCLUSIONS

EVAR has shown better short-term benefit and survival than Open management; however, the latter still prevails in the long-term in our Peruvian UIAAA cohort. Further follow-up studies are required to demonstrate the long-term benefit of EVAR in our population.

BIBLIOGRAPHY

- Behrendt CA, Sedrakyan A, Rieß HC, Heidemann F, Kölbel T, Petersen J, Debus ES. Short-term and long-term results of endovascular and open repair of abdominal aortic aneurysms in Germany. J Vasc Surg. 2017 Dec;66(6):1704-1711.e3. doi: 10.1016/j.jvs.2017.04.040. Epub 2017 Aug 7.
- Schmitz-Rixen T, Böckler D, Vogl TJ, Grundmann RT. Endovascular and Open Repair of Abdominal Aortic Aneurysm. Dtsch Arztebl Int. 2020 Oct 20;117(48):813-819. doi: 10.3238/arztebl.2020.0813.
- Varkevisser RRB, O'Donnell TFX, Swerdlow NJ, Liang P, Li C, Ultee KHJ, Pothof AB, De Guerre LEVM, Verhagen HJM, Schermerhorn ML. Fenestrated endovascular aneurysm repair is associated with lower perioperative morbidity and mortality compared with open repair for complex abdominal aortic aneurysms. J Vasc Surg. 2019 Jun;69(6):1670-1678. doi: 10.1016/j.jvs.2018.08.192.