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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)				
	OPEN		EVAR		*p*
	N=205	%=81.67	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/m²)					
<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	
COPD	56	27.31	15	32.60	0.079
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 (VQI)	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.

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.

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

OUTCOMES	UIAAA TREATMENT (N=251)				
	OPEN		EVAR		*p*
	N=205	%=81.67	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.

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 IUAAA <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).

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

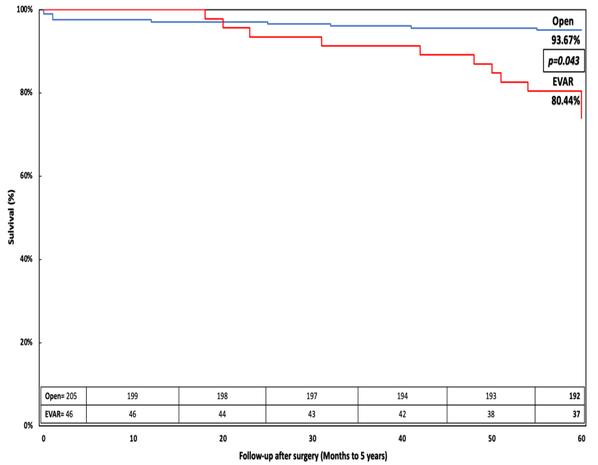
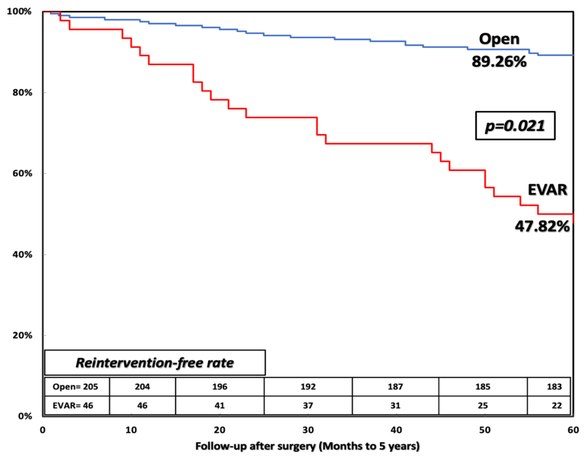


Figure 01. 5-year freedom from reintervention rate of UIAAA treated Open and EVAR according to Kaplan-Meier analysis.



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.

Author Contact: W Samir Cubas MD MSc. Department of Thoracic and Cardiovascular Surgery, Edgardo Rebagliati Martins National Hospital, Lima, Peru. E-mail: wsamircubas@gmail.com