

Prognostic Significance of Aneurysm Sac Shrinkage After Endovascular Aneurysm Repair

George A. Antoniou et al. *J Endovasc Ther.* 2020;27(5).

Supplementary Table 1. Baseline Characteristics of Patients in the Included Studies.^{a,b}

Author	Men	Age, y	HTN	CAD	DM	COPD	Smoking	Anticoagulation Treatment	Elective EVAR
Mirza ¹²	NR	NR	NR	NR	NR	NR	NR	NR	NR
O'Donnell ¹³	NR	NR	NR	NR	NR	NR	NR	NR	NR
Deery ¹⁴	NR	NR	NR	NR	NR	NR	NR	NR	All (rEVAR excluded)
Fujimura ¹⁶	NR	NR	NR	NR	NR	NR	NR	NR	All (rEVAR excluded)
Langenberg ¹⁷	138/152 vs 186/209	72.4±6.6 vs 74.3±6.6 (p=0.006)	92/152 vs 111/209	74/152 vs 98/209 ^c	24/152 vs 40/209	NR	48/152 vs 68/209	NR	All
Soler ¹⁸	99/102 vs 91/95	73.7 vs 76.0 (p=0.046)	73/102 vs 68/95	63/102 vs 58/95	83/102 vs 81/95	NR	80/102 vs 72/95	NR	All
Bastos Gonçalves ¹⁹	263/313 vs 243/284	NR	193/299 vs 175/274	125/299 vs 121/174	38/300 vs 44/274	58/295 vs 28/273	NR	NR	273/313 vs 270/284 ^d
Ciery ²⁰	709/768 vs 616/682	72.1±7.5 vs 74.2±7.8 (p<0.001)	587/768 vs 528/682	343/768 vs 328/682	97/768 vs 82/682	376/768 vs 331/682	467/768 vs 366/682	47/768 vs 60/682	NR

Abbreviations: CAD, coronary artery disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; EVAR, endovascular aneurysm repair; HTN, hypertension; NR, not reported; rEVAR, ruptured EVAR.

^aData are presented as shrinkage vs no shrinkage.

^bContinuous data are presented as the mean $\pm$ standard deviation; categorical data are given as the number/sample.

^cCardiac history.

^dNon-ruptured.

Prognostic Significance of Aneurysm Sac Shrinkage After Endovascular Aneurysm Repair

George A. Antoniou et al. *J Endovasc Ther.* 2020;27(5).

Supplementary Table 2. Anatomical Characteristics of the Patients in the Included Studies.^{a,b}

Author	AAA Diameter, mm	Proximal Aortic Neck Length, mm	Proximal Aortic Neck Diameter, mm	Proximal Neck Angulation, deg
Mirza ¹²	NR	NR	NR	NR
O'Donnell ¹³	NR	NR	NR	NR
Deery ¹⁴	NR	NR	NR	NR
Fujimura ¹⁶	NR	NR	NR	NR
Langenberg ¹⁷	63.1±11.2 vs 60.1±9.0 (p=0.004)	NR	NR	NR
Soler ¹⁸	55.8 vs 57.7 (p=0.152)	31.0 vs 27.7 (p=0.035)	23.1 vs 24.0	29.0 vs 28.6
Bastos Gonçalves ¹⁹	NR	NR	NR	NR
Ciery ²⁰	54.8±10.2 vs 55.6±10.4 (p=0.141)	25.9±11.2 vs 24.5±10.4 (p=0.021)	23.5±3.3 vs 23.5±3.7 (p=0.992)	NR

Abbreviations: AAA, abdominal aortic aneurysm; NR, not reported.

^aData are presented as shrinkage vs no shrinkage.

^bContinuous data are presented as the mean ± standard deviation if available

Prognostic Significance of Aneurysm Sac Shrinkage After Endovascular Aneurysm Repair

George A. Antoniou et al. *J Endovasc Ther.* 2020;27(5).

Supplementary Table 3. Newcastle-Ottawa Scale and Risk of Bias Tables per Study.

Author	Selection				Comparability	Outcome			Total
	Is the case definition adequate?	Representativeness of the cases	Selection of controls	Definition of controls	Comparability of cases and controls on the basis of the design or analysis	Ascertainment of outcome	Was follow-up long enough for outcomes to occur?	Adequacy of follow-up of cohorts	
Mirza ¹²	NA	NA	NA	NA	NA	NA	NA	NA	NA
O'Donnell ¹³	—	—	*	*	**	*	—	—	5
Deery ¹⁴	—	—	*	*	*	*	—	—	4
Fujimura ¹⁶	—	*	*	*	—	—	*	—	4
Langenberg ¹⁷	*	*	*	*	—	—	—	—	4
Soler ¹⁸	—	*	*	*	—	—	—	—	3
Bastos Gonçalves ¹⁹	—	—	*	*	*	—	*	—	4
Ciery ²⁰	—	*	*	*	—	—	*	—	4

Abbreviation: NA, no data available.

Bastos Gonçalves¹⁹

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	High risk	No description.

Selection - Representativeness of the cases	High risk	198 of 840 patients were excluded because 2 equivalent consecutive scans were not available within the specified interval.
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.
Selection - Definition of controls	Low risk	Controls adequately defined.
Comparability	Low risk	Cases and controls were not matched in the design but confounders were adjusted for in the analysis.
Outcome - Ascertainment of outcome	High risk	No description.
Outcome - Was follow-up long enough for outcomes to occur?	Low risk	Yes (median 3.1-3.2 years).
Outcome - Adequacy of follow-up of cohorts	Low risk	No statement.

Ciery²⁰

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	High risk	No description.
Selection - Representativeness of the cases	Low risk	All eligible cases with outcome of interest over a defined period of time were included.
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.

Selection - Definition of controls	Low risk	Controls adequately defined.
Comparability	Low risk	Cases and controls were not matched in the design and confounders were not adjusted for in the analysis.
Outcome - Ascertainment of outcome	High risk	No description.
Outcome - Was follow-up long enough for outcomes to occur?	Low risk	Yes (median 45 months).
Outcome - Adequacy of follow-up of cohorts	High risk	No statement.

Deery¹⁴

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	High risk	No description of independent validation. Most probably the authors did not resort to primary record source such as CT scans or medical/hospital records.
Selection - Representativeness of the cases	High risk	Patients with no 1-year follow-up were excluded (these patients accounted for 26%).
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.
Selection - Definition of controls	Low risk	Controls adequately defined.
Comparability	Low risk	Cases and controls were not matched in the design but confounders were adjusted for in the analysis.
Outcome - Ascertainment of outcome	Low risk	Long-term survival (primary outcome) was established using linkage of the Vascular Study Group of New England data to the Social

		Security Death Index Masterfile.
Outcome - Was follow-up long enough for outcomes to occur?	High risk	No data on length of follow-up.
Outcome - Adequacy of follow-up of cohorts	High risk	No data on losses to follow-up.

Abbreviation: CT, computed tomography.

Fujimura¹⁶

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	High risk	There doesn't seem to be an independent validation.
Selection - Representativeness of the cases	Low risk	All cases were included.
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.
Selection - Definition of controls	Low risk	Adequate definition of controls.
Comparability	Low risk	Cases and controls were not matched in the design and confounders were not adjusted for in the analysis of one of the review primary outcomes (all-cause mortality).
Outcome - Ascertainment of outcome	High risk	No description.
Outcome - Was follow-up long enough for outcomes to occur?	Low risk	Yes (mean 45.5 months).
Outcome - Adequacy of follow-up of cohorts	High risk	No statement.

Langenberg¹⁷

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	Low risk	Reference to primary record source (hospital records).
Selection - Representativeness of the cases	Low risk	All eligible cases were considered.
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.
Selection - Definition of controls	Low risk	Controls adequately defined.
Comparability	High risk	Cases and controls were not matched in the design and confounders were not adjusted for in the analysis.
Outcome - Ascertainment of outcome	High risk	No data on the most clinically important outcome (mortality) suitable for meta-analysis.
Outcome - Was follow-up long enough for outcomes to occur?	High risk	No information on length of follow-up.
Outcome - Adequacy of follow-up of cohorts	High risk	No statement.

Mirza¹²

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	Unclear risk	No data available.
Selection - Representativeness of the cases	Unclear risk	No data available.
Selection - Selection of controls	Unclear risk	No data available.
Selection - Definition of controls	Unclear risk	No data available.

Comparability	Unclear risk	No data available.
Outcome - Ascertainment of outcome	Unclear risk	No data available.
Outcome - Was follow-up long enough for outcomes to occur?	Unclear risk	No data available.
Outcome - Adequacy of follow-up of cohorts	Unclear risk	No data available.

O'Donnell¹³

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	High risk	No description of independent validation. Most probably the authors did not resort to primary record source such as CT scans or medical/hospital records.
Selection - Representativeness of the cases	High risk	Only around half of the originally identified cohort was included in study analysis. Patients without follow-up and a 1-year scan were not included.
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.
Selection - Definition of controls	Low risk	Controls adequately defined.
Comparability	Low risk	Propensity matched analysis.
Outcome - Ascertainment of outcome	Low risk	Assessment of primary outcome (long-term mortality) through linkage to the Social Security Death Index.
Outcome - Was follow-up long enough for outcomes to occur?	High risk	No data on length of follow-up.
Outcome - Adequacy of follow-up of	High risk	No data on losses to follow-up.

cohorts		
---------	--	--

Abbreviation: CT, computed tomography.

Soler¹⁸

Item	Authors' Judgment	Support for Judgment
Selection - Is the case definition adequate?	High risk	Probably no independent validation.
Selection - Representativeness of the cases	Low risk	All eligible cases with outcome of interest over a defined period of time were included.
Selection - Selection of controls	Low risk	The control series used in the study is derived from the same population as the cases.
Selection - Definition of controls	Low risk	Controls adequately defined.
Comparability	High risk	Cases and controls were not matched in the design and confounders were not adjusted for in the analysis.
Outcome - Ascertainment of outcome	High risk	No description.
Outcome - Was follow-up long enough for outcomes to occur?	High risk	No data on follow-up after sac shrinkage.
Outcome - Adequacy of follow-up of cohorts	High risk	No statement.

Prognostic Significance of Aneurysm Sac Shrinkage After Endovascular Aneurysm Repair

George A. Antoniou et al. *J Endovasc Ther.* 2020;27(5).

Supplementary Table 4. Outcome Data.^{a,b}

Author	Endoleak	Late Complications	Reintervention	All-Cause Mortality	Aneurysm-Related Mortality	Aneurysm Rupture
Mirza ¹²	NR	NR	NR	ln(HR) -0.05, SE 0.12 ^{k,l,m}	NR	NR
O'Donnell ¹³	NR	NR	NR	ln(HR) -0.18, SE 0.08 ^{c,n}	NR	NR
Deery ¹⁴	NR	NR	NR	HR 0.6, 95% CI 0.5 to 0.8 ^o	NR	NR
Fujimura ¹⁶	NR	HR 0.425, 95% CI 0.236 to 0.765 ^{e,f}	NR	ln(HR) -0.15, SE 0.21 ^p	NR	NR
Langenberg ¹⁷	7/152 vs 52/209	NR	NR	NR	NR	0/152 vs 3/209
Soler ¹⁸	NR	NR	19/102 vs 28/95 ln(HR) -0.93, SE 0.31 ^c	34/102 vs 49/95 ln(HR) -0.89, SE 0.23 ^c	NR	0/102 vs 4/95 ln(HR) -2.65, SE 1.00 ⁿ
Bastos Gonçalves ¹⁹	14/313 vs 20/284 ln(HR) -1.15, SE 0.47 ^{c,d}	HR 0.322, 95% CI 0.571 to 0.181 ^{g,h,i}	ln(HR) -0.82, SE 0.25 ^{c,j}	NR	NR	NR
Ciery ²⁰	NR	NR	NR	ln(HR) -0.32, SE 0.09 ^c	ln(HR) -0.22, SE 0.52 ^c	1/768 vs 16/682

Abbreviations: NR, not reported.

^aData are presented as shrinkage vs no shrinkage.

^bData are given as the number/sample, if available, and/or the hazard ratio (HR) and 95% confidence interval (CI) or the logarithm of the HR [ln(HR)] and standard error (SE).

^cHazard ratio calculated from curve data and numbers at risk.

^dType I, III, or undetermined endoleak.

^eCox proportional hazards modeling (adjustments for aneurysm size, diabetes, American Society of Anesthesiologists score >III, operative time, blood transfusion, Endurant device, type I/II/III endoleak, early complications).

^fDefined as any aneurysm-related events.

^gMajor shrinkage (≥ 10 mm) vs no shrinkage.

^hCox proportional hazards modeling (adjustments for early sac dynamics, baseline abdominal aortic aneurysm diameter, rupture as surgical indication, use of aortouni-iliac endoprosthesis, occurrence of intraoperative complications, and development of complications before the index examination).

ⁱDefined as direct (type I or III) or undetermined endoleak, endograft occlusion, post-implantation rupture, endograft infection, migration exceeding 10 mm or device integrity failure.

^jMajor shrinkage (≥ 10 mm) vs no shrinkage.

^kHazard ratio calculated from curve data.

^lSac regression vs early sac expansion.

^mAge-adjusted.

ⁿPropensity matching.

^oCox proportional hazards modeling (adjustments for age, sex, comorbidities known to affect survival, history of prior aortic surgery, concomitant procedures, presence of endoleak at 1 year, reinterventions).

^pHazard ratio calculated from log-rank p and number of events.