# Invasive versus conservative management in spontaneous coronary artery dissection: a meta-analysis and meta-regression study

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**Background:** There is a paucity of data regarding the best treatment for spontaneous coronary artery dissection (SCAD).

**Purpose:** To compare the prognostic impact of conservative versus invasive treatment in patients with SCAD.

**Methods:** We systematically searched the literature for studies evaluating the comparative efficacy and safety of invasive revascularization versus medical therapy for the treatment of SCAD from 1990 to 2019. Random-effect meta-analysis was performed comparing clinical outcomes between the two groups.

**Results:** 24 observational studies with 1720 patients were included. After 28±14 months, a conservative approach reduced target vessel revascularization rate compared with invasive treatment (OR=0.50; 95% CI 0.28–0.90; P=0.02). No difference was found regarding all-cause mortality

(OR=0.81; 95% CI 0.31–2.08; P=0.66), cardiovascular mortality (OR=0.89; 95% CI 0.15–5.40; P=0.89), myocardial infarction (OR=0.95; 95% CI 0.50–1.81; P=0.87), heart failure (OR 0.96; 95% CI 0.41–2.22; P=0.92) and SCAD recurrence (OR=0.94; 95% CI 0.52–1.72; P=0.85). The metaregression analysis suggested that male gender, diabetes mellitus, smoking habit, prior coronary artery disease, left main coronary artery involvement and lower ejection fraction at admission are related with higher overall mortality, whereas SCAD recurrence was higher among patients with fibromuscular dysplasia.

**Conclusion:** A conservative approach provides similar clinical outcomes and lower target vessel revascularization rates compared to an invasive strategy in the setting of SCAD; therefore, when feasible, it should be preferred in this scenario

#### A. All-cause death

	MT		Revasc			Odds Ratio	Odds Ratio		
Study or Subgroup	Events	Tetal	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI		
Abreu, 2018	. 3	15	. 0	15	7.4%	7.00 [0.33, 150.06]			
Alfonso 2012	0	29	0	16		Not estimable	16 1		
Alfonso, 2012	0	. 7	0	4		Not estimable			
Buja, 2013	1	18	1	20	8.2X	1.12 (0.06, 19.28)			
Cade, 2017	1		0	5	4.3X	2.20 (0.07, 64.90)			
Convotto, 2017	2	57	13	107	17.5%	0.26 [0.06, 1.21]			
Codinho, 2016	0	13	0	4		Not estimable			
to, 2011	0	14	0	9		Not estimable			
jorgensen, 1994	0	- 6	. 0	4		Not estimable			
Kim, 2019	0	- 6	0	7		Not estimable	100 000		
Lettieri, 2015	- 2	78	2	56	13.3X	0.71 [0.10, 5.20]	-		
De, 2019	- 5	33	4	85	19.1%	3.62 (0.91, 14.42)			
Lobo, 2019	0	16	1	37	6.7%	0.74 (0.03, 19.07)	-		
McCrath-Cadell, 2016	0	27	0	13		Not estimable			
Mortensen, 2009	0	. 7	0	15		Not estimable			
Rogowski, 2017	0	. 56	. 1		6.6X	0.04 (0.00, 1.19)	• • •		
Roura, 2016	0	26	1	. 8	6.5X	0.09 [0.00, 2.56]			
Sultan, 2015	0	- 6	0	4		Not estimable			
Tweet, 2014	1	94	1	95	8.5%	1.01 (0.06, 16.40)			
Vanzetto, 2009	0	10	0	13		Not estimable			
Total (95% Ct)		526		522	100.0%	0.81 (0.31, 2.08)			
Total events	15		24						
Heterogeneity: Tau <sup>2</sup> = 0	1.72; Chi		1. df = 1	P = 0	1.14× 1° =	33%	0.01 0.1 10		
fest for overall effect: 2	= 0.44 (	P = 0.6	4)				Favours MT Favours Rev		

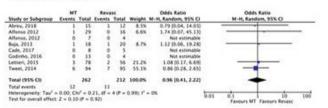
### B. Cardiovascular death

Study or Subgroup	Events		Reva		Weight	Odds Ratio M-H, Random, 95% CI	Odds Ratio M-H, Random, 95% CI	
Abreu, 2018	0	15	0	12	-	Not estimable		_
Alfonso 2012	1	29	1	16	40.5%	0.54 [0.03, 9.19]	-	
Alfonso, 2012	0	7	0	4		Not estimable	17.50 May 18.50	
Cade, 2017	1		0	5	28.6%	2.20 [0.07, 64.90]		-
Godinho, 2016	0	13	0	4		Not estimable		
ho, 2011	0	14	0	. 9		Not estimable		
Kim, 2019	0	- 6	0	7		Not estimable		
Lobo, 2019	.0	16	1	37	30.9%	0.74 [0.03, 19.07]	-	
McCrath-Cadell, 2016	0	27	0	13		Not estimable	100	
Sultan, 2015	0	6	0	- 4		Not estimable		
Total (95% CI)		141		111	100.0%	0.89 [0.15, 5.40]		
Yotal events	2		2				- 5	
Heterogeneity: Tau <sup>1</sup> = 0	0.00; CN <sup>2</sup>	= 0.4	, df = 2	0-0	$E(t); t^2 = 0$	0.0	01 01 10	
Test for overall effect: 2	0.110	P = 0.8	190				Favours MT Favours Revote	4

#### C. Myocardial infarction

	MT		Reva	sc.		Odds Ratio	Odds Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% CI	M-H, Random, 95% CI
Abrev, 2018	. 5	15	- 4	12	16.1N	1.00 (0.20, 5.00)	
Alfonso 2012	0	29	1	16	1.9%	0.18 (0.01, 4.56)	
Alfonso, 2012	0	7	0	4		Not estimable	
Buja, 2013	0	18	0	20		Not estimable	
Cade, 2017	0		0	5		Not estimable	Control Control
Conrotto, 2017	6	46	10	6.7	35.2%		
Codinho, 2016	4	13	0	- 4	4.3%	4.26 (0.19, 97.48)	
Lettieri, 2015	1	78	- 1	56	5.4%	0.71 [0.04, 11.67]	
McGrath-Cadell, 2016	3	27	1	13	7.5%	1.50 (0.14, 16.00)	
Rogowski, 2017	A	56	0		4.6%	1.46 [0.07, 29.57]	
Roura, 2016	2	- 26	0	. 8	4.2%	1.73 [0.08, 39.88]	
Saw, 2014	6	129		29	15.3N	0.61 [0.12, 3.18]	
Sultan, 2015	1	- 6	0	4	3.5%	2.45 [0.08, 76.13]	
Vanzetto, 2009	0	10	0	13		Not estimable	
Total (95% CO		478		259	100.0%	0.95 [0.50, 1.81]	-
Total events	12		19				
Heterogeneity: Tau <sup>2</sup> = 0		- 2.54		(F = 0.	97% IF = 1	0%	to to to
Test for overall effect: 2				1237			6.01 0.1 10 1 Favours MI Favours Revasc

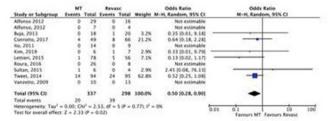
#### D. Heart failure



#### E. Recurrent SCAD

Study or Subgroup	Events		Reva Events		Weight	Odds Ratio M-H, Random, 95% CI		Odds Ratio M-H, Random, 95% CI
Alfonso 2012	.0	29	0	16		Not estimable		
Alfonso, 2012	0	7	0	4		Not estimable		
Cade, 2017	0		0	5		Not estimable		
Kim, 2019:	0	- 6	0	7		Not estimable		
Macaya, 2019	1	32	1	. 8	4.3%	0.23 (0.01, 4.07)		-
McGrath-Cadell, 2016	3	27	. 0	13	3.9%	3.86 (0.19, 80.37)		-
Nakashima, 2016	6	28	12	35	27.5%	0.52 [0.17, 1.64]		
Rogowski, 2017	1	56	0	. 8	3.8N	1.11 (0.05, 23.49)	_	
Roura, 2016	0	26	0	. 8		Not estimable		
Sultan, 2015	. 3	- 6	. 0	4	3.3%	9.00 (0.34, 238.21)		
Tweet, 2014	15	94	14	95	57.1%	1.10 (0.50, 2.42)		-
Vanzetto, 2009	0	10	0	13		Not estimable		1. 2. S.
Total (95% CI)		329		216	100.0%	0.94 (0.52, 1.72)		•
Total events	31		27					
Heterogeneity: Tau <sup>2</sup> + 0		= 4.87	. df = 5	P = 0.	640; 1° = 1	0%	0.01 0	1 10
Test for overall effect: 2	2 = 0.190	P = 0.8	(5)					Favours MT Favours Revosc

## F. Target vessel revascularization



Forest plots on the study outcomes