Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

Appendix 1: Supplementary materials

Literature search

Limits: English, Humans
Databases: (PubMed; Embase; Web of Science; Cochrane Library; CINAHL; EconLit; PsycINFO; CRD, DARE, NHS EED)

1. PubMed		
#15	Search (((((((coronary artery bypass graft) OR coronary artery bypass grafting) OR aortocoronary bypass) OR cardiac bypass) OR coronary bypass) OR "Coronary Artery Bypass"[Mesh])) AND (((((da vinci) OR da vinci) OR robot assisted surgery) OR robotic surgery) OR "Robotic Surgical Procedures"[Mesh])	577
#14	Search ((((da vinci) OR davinci) OR robot assisted surgery) OR robotic surgery) OR "Robotic Surgical Procedures"[Mesh]	19635
#13	davinci	362
#12	Search da vinci	4466
#11	Search robot assisted surgery	6394
#10	Search robotic surgery	14445
#7	Search "Robotic Surgical Procedures"[Mesh]	3515
#6	Search (((((coronary artery bypass graft) OR coronary artery bypass grafting) OR aortocoronary bypass) OR cardiac bypass) OR Coronary bypass) OR "Coronary Artery Bypass"[Mesh]	95051
#5	Search coronary artery bypass graft	65964
#4	Search aortocoronary bypass	66415
#3	Search cardiac bypass	69225
#2	Search coronary bypass	70962
#1	Search "Coronary Artery Bypass"[Mesh]	49543
2. EMBASE		
1.	exp coronary artery bypass graft/	71595
2.	cardiac bypass.mp.	682
3.	coronary artery bypass.mp	88575
4.	aortocoronary bypass.mp.	78008
5.	1 or 2 or 3 or 4	178008
5.	"da vinci".mp.	1076
6.	davinci.mp.	5039
7.	exp robotic surgical procedure*/	1985
8.	robotic surgery.mp. or exp robot assisted surgery/	9915
9.	5 or 6 or 7 or 8	15264
10.	5 and 9	314
3. Web of Science		
#1	TOPIC: ("robot assisted surgery")	810
#2	TOPIC: ("robotic surgery")	4828
#3	TOPIC: ("robotic surgical procedure*")	177
#4	TOPIC: (davinci)	794
#5	TOPIC: ("da vinci")	3582
#6	#5 OR #4 OR #3 OR #2 OR #1	10194
#7	TOPIC: (coronary bypass)	8481
#8	TOPIC: ("coronary artery bypass")	257
#9	TOPIC: ("cardiac bypass")	467
#10	TOPIC: ("aortocoronary bypass")	1932
#11	TOPIC: ("coronary artery bypass grafting")	17704
#12	#11 OR #10 OR #9 OR #8 OR #7	35618
#13	#12 OR #6	107
4. Cochrane Library		
#1	MeSH descriptor: [Robotic Surgical Procedures] explode all trees	111
#2	robotic surgery	1014
#3	"da vinci"	186
#4	davinci	32
#5	"robot assisted surgery"	283

Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

#6	#1 OR #2 OR #3 OR #4 OR #5	1107
#7	MeSH descriptor: [Coronary Artery Bypass"] explode all trees	5648
#8	aortocoronary bypass	307
#9	coronary bypass	1357
#10	Coronary artery bypass grafting	4172
#11	# 7 OR #8 OR #9 OR #10	13951
#12	#11 AND #6	12
5. CINAHL		
S12	S6 AND S11	89
S11	S7 OR S8 OR S9 OR S10	13374
S10	Coronary artery bypass grafting	3372
S9	aortocoronary bypass	118
S8	coronary bypass	13352
S7	coronary artery bypass	12860
S6	S1 OR S2 OR S3 OR S5	1994
S5	da vinci	437
S4	davinci	314
S3	"robotic surgical procedure*"	874
S2	"robotic surgery"	842
S1	"robot assisted surgery"	116
6. ECONLIT		
S12	S6 AND S12	2
S11	S7 OR S8 OR S9 OR S10 OR S11	30
S10	"robot assisted surgery"	0
S9	"robotic surgery"	3
S8	"robotic surgical procedure*"	0
S7	"da vinci"	27
S6	davinci	0
S5	S1 OR S2OR S3 OR S4 OR S5	0
S4	coronary artery bypass	51
S3	coronary bypass	56
S2	aortocoronary bypass	0
S1	Coronary artery bypass grafting	14
7. Psyc INFO		
1.	coronary artery bypass graft/	429
2.	cardiac bypass.mp.	27
3.	coronary artery bypass.mp	823
4.	aortocoronary bypass.mp.	8
5.	1 or 2 or 3 or 4	853
6.	"da vinci".mp.	105
7.	davinci.mp.	0
8.	exp robotic surgical procedure/	54
9.	"robotic surgery".mp.	71
10.	exp robot assisted surgery/	112
11.	6 or 7 or 8 or 9 or 10	275
12.	5 and 11	0
8. CRD, DARE, NHS EED		
1	MeSH DESCRIPTOR Robotic Surgical Procedures EXPLODE ALL TREES	22
2	(robot assisted surgery)	25
3	(robotic surgery)	58
4	(davinci)	3
5	(da vinci)	39
6	#1 OR #2 OR #3 OR #4 OR #5	133
8	MeSH DESCRIPTOR Coronary Artery Bypass EXPLODE ALL TREES	527
9	(coronary bypass)	91
10	(aortocoronary bypass)	2
11	(coronary)artery bypass grafting	362
12	#8 OR #9 OR #10 OR #11	728
13	#12 OR #6	36

Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

Supplementary Table S1. Characteristics of included studies

Study	Study period (country)	Design	Number of participants	Follow-up (months) Mean± SD Median (range) [IQR]	Endpoints
RCAB vs C-CABG					
Leyvi (2018) [7] USA	Oct 2012- Nov 2014 (USA)	Prospective cohort	RCAB: 28 C-CABG(on): 10	Hospital stay	Anaesthesia time, Complications, , ICU stay, Length of hospital stay, Operating time, Revascularization, Transfusion, Ventilation time
Su (2018) [8] Taiwan	Jan 2005-Nov 2013 (Taiwan)	Retrospective cohort	RCAB: 139 C-CABG: 147	RCAB: 52.8 [13.2-69.6]* C-CABG: 33.6 [16.8-67.2]*§	Complications, ICU stay, Late MI, Length of hospital stay, Mortality, Revascularization, Survival
Leyvi (2016) [9] USA	Jan 2007- Mar 2012 (USA)	Retrospective cohort (matched cohort)	RCAB: 141 C-CABG(on): 141	1 month postoperative	Anaesthesia time, Complications, ICU stay, Length of hospital stay, Mortality, Operating time, Readmission, Reoperation for bleeding, Transfusion
Raad (2016) [10] USA	Jan 2007- Mar 2012 (USA)	Retrospective cohort (matched cohort)	RCAB: 142 C-CABG(on): 142	1 month postoperative	Complications, Length of hospital stay, Postoperative pain, Readmission, Reoperation for bleeding, Ventilation time
Ezelsoy (2015) [11] Turkey	Jan 2004-Dec 2011 (Turkey)	Retrospective cohort	RCAB: 35 C-CABG(on): 35	RCAB: 87.6±15.6* C-CABG(on): 68.4±20.4*	Complications, , ICU stay, Length of hospital stay, Operating time, Postoperative pain, Ventilation time
Zaouter (2015) [12] France	Sep 2011- Mar 2014 (France)	Retrospective cohort	RCAB: 38 C-CABG(on): 33	Hospital stay	Anaesthesia time, , Complications, Graft stenosis/ failure, ICU stay, Length of hospital stay, Mortality, Reoperation for bleeding, Transfusion, Ventilation time
Poston (2008) [13] USA	Jan 2005-Jun 2007 (USA)	Retrospective cohort (matched cohort)	RCAB: 100 C-CABG(off): 100	12 months postoperative	Complications, graft stenosis/ failure, ICU stay, late stroke, length of hospital stay, mortality, operating time, postoperative pain, readmission, reoperation for bleeding, revascularization, time to return to normal activities, ventilation time
Bucerius (2002) [14] Germany	NR (Germany)	Prospective cohort	RCAB: 24 C-CABG(on): 93	Hospital stay	ICU stay, Length of hospital stay, Postoperative pain, Ventilation time
RCAB vs MIDCAB					
Gong (2016) [15] China	May 2009- May 2014 (China)	Retrospective cohort	RCAB: 71 MIDCAB: 61	Overall: 22 (12-60)	Angina, Complications, ICU stay, Late MI, Late stroke, Length of hospital stay, Mortality, Operating time, Postoperative pain, Reoperation for bleeding, Revascularization, Transfusion, Ventilation time, Survival
Bachinsky (2012) [16] USA	Sep 2009- Mar 2011 (USA)	Prospective cohort	RCAB: 25 MIDCAB: 27	1 month postoperative	Complications, ICU stay, Length of hospital stay, Mortality, Operating time, Postoperative pain, Quality of life, Revascularization, Time to return to normal activities, Transfusion
Bucerius (2002) [14] Germany	NR (Germany)	Prospective cohort	RCAB: 24 MIDCAB: 73	Hospital stay	ICU stay, Length of hospital stay, Postoperative pain, Ventilation time
RCAB vs PA-CAB					
Jegaden (2011) [17] France	RCAB: 2003- 2008 PA-CAB: 1998 - 2003 (France)	Retrospective cohort	RCAB: 59 PA-CAB: 48	RCAB: 21.6±1.2* PA-CAB: 46.8±3.6*§	Angina, Complications, , Graft stenosis/ failure, ICU stay, Late MI, Length of hospital stay, Mortality, Operating time, Reoperation for bleeding, Revascularization, Ventilation time, Survival
RCAB vs non-RCAB					
Whellan (2016) [18] USA	2006-2012 (USA)	Retrospective cohort	RCAB: 9,862 non-RCAB: 956,349	1 month postoperative	Complications, , Length of hospital stay, Mortality, Reoperation for bleeding, Ventilation time
Cavallaro (2015) [19] USA	2008-2010 (USA)	Retrospective cohort (matched cohort)	RCAB: 464 non-RCAB: 464	Hospital stay	Complications, Length of hospital stay, Mortality, Transfusion

* Converted from years, CABG= Coronary Artery Bypass Grafting; C-CABG= Conventional Coronary Artery Bypass Grafting (median sternotomy); C-CABG (off) = Conventional Coronary Artery Bypass Grafting (median sternotomy) (off pump); C-CABG (on) = Conventional Coronary Artery Bypass Grafting (median sternotomy) (on pump); IQR= Interquartile Range; MIDCAB= Minimally Invasive Direct Coronary Artery Bypass; NIS= National Inpatient Sample; Non-RCAB= Non-robotic Coronary Artery Bypass; PA-CABG= Port Access Coronary Artery Bypass Grafting; RCAB= Robotic Coronary Artery Bypass; SD= Standard Deviation

Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

Supplementary Table S2: Excluded studies

	Reason
Bonatti JO, Zimrin D, Lehr EJ, Vesely M, Kon ZN, Wehman B, de Biasi AR, Hofauer B, Weidinger F, Schachner T, Bonaros N, Friedrich G. Hybrid coronary revascularization using robotic totally endoscopic surgery: perioperative outcomes and 5-year results. Ann Thorac Surg. 2012 Dec;94(6):1920-1926	Comparison group not relevant
Buehler A, Ferri C, Flato UA, Fernandes J. Robotically assisted coronary artery bypass grafting: a systematic review and meta-analysis. Int J Med Robot. 2015 Jun;11(2):150-158	Inclusion of abstract
de Cannière D, Wimmer-Greinecker G, Cichon R, Gulielmos V, Van Praet F, Seshadri-Kreaden U, Falk V. Feasibility, safety, and efficacy of totally endoscopic coronary artery bypass grafting: multicenter European experience. J Thorac Cardiovasc Surg. 2007 Sep;134(3):710-716	Comparison group not relevant
Detter C, Boehm DH, Reichenspurner H, Deuse T, Arnold M, Reichart B. Robotically-assisted coronary artery surgery with and without cardiopulmonary bypass - from first clinical use to endoscopic operation. Med Sci Monit. 2002 Jul;8(7):MT118-MT123	Intervention group not relevant
Dillon KE, Johnson M, Chan IL, Kiaii B. Eligibility for Minimally Invasive Coronary Artery Bypass: Examination of Epicardial Adipose Tissue Using Computed Tomography. Innovations (Phila). 2017 Mar/Apr;12(2):121-126	Comparison group not relevant
Falk V, Gummert JF, Walther T, Hayase M, Berry GJ, Mohr FW. Quality of computer enhanced totally endoscopic coronary bypass graft anastomosis--comparison to conventional technique. Eur J Cardiothorac Surg. 1999 Mar;15(3):260-264	Outcome not relevant
Cao C, Indraratna P, Doyle M, Tian DH, Liou K, Munkholm-Larsen S, Uys C, Virk S. A systematic review on robotic coronary artery bypass graft surgery. Ann Cardiothorac Surg. 2016 Nov;5(6):530-543	Inclusion of case series
Harskamp RE, Brennan JM, Xian Y, Halkos ME, Puskas JD, Thourani VH, Gammie JS, Taylor BS, de Winter RJ, Kim S, O'Brien S, Peterson ED, Gaca JG. Practice patterns and clinical outcomes after hybrid coronary revascularization in the United States: an analysis from the society of thoracic surgeons adult cardiac database. Circulation. 2014 Sep 9;130(11):872-879.	Unclear intervention group
Kappert U, Schneider J, Cichon R, Gulielmos V, Schade I, Nicolai J, Schueler S. Closed chest totally endoscopic coronary artery bypass surgery: fantasy or reality? Curr Cardiol Rep. 2000 Nov;2(6):558-563	Comparison group not relevant
Katz MR, Van Praet F, de Canniere D, Murphy D, Siwek L, Seshadri-Kreaden U, Friedrich G, Bonatti J. Integrated coronary revascularization: percutaneous coronary intervention plus robotic totally endoscopic coronary artery bypass. Circulation. 2006 Jul 4;114(1 Suppl):I473-I476	Case series
Khaliel F, Giambruno V, Chu MWA, Sridhar K, Teefy P, Kiaii BB. Consequences of Hybrid Procedure Addition to Robotic-Assisted Direct Coronary Artery Bypass. Innovations (Phila). 2017 May/Jun;12(3):192-196	Comparison group not relevant
Leyvi G, Forest SJ, Srinivas VS, Greenberg M, Wang N, Mais A, Snyder MJ, DeRose JJ Jr. Robotic coronary artery bypass grafting decreases 30-day complication rate, length of stay, and acute care facility discharge rate compared with conventional surgery. Innovations (Phila). 2014 Sep-Oct;9(5):361-367	Patients already included in another study
Sabashnikov A, Patil NP, Weymann A, Mohite PN, Zych B, García Sáez D, Popov AF, Wahlers T, Wittwer T, Wippermann J, Amrani M, Trimlett R, Simon AR, Pepper J, Bahrami T. Outcomes after different non-sternotomy approaches to left single-vessel revascularization: a comparative study with up to 10-year follow-up. Eur J Cardiothorac Surg. 2014 Oct;46(4):e48-55	Intervention group not relevant
Soylu E, Harling L, Ashrafian H, Attaran S, Athanasiou C, Punjabi PP, Casula R, Athanasiou T. A systematic review of the safety and efficacy of distal coronary artery anastomotic devices in MIDCAB and TECAB surgery. Perfusion. 2016 Oct;31(7):537-543.	Intervention group not relevant
Tan A, Ashrafian H, Scott AJ, Mason SE, Harling L, Athanasiou T, Darzi A. Robotic surgery: disruptive innovation or unfulfilled promise? A systematic review and meta-analysis of the first 30 years. Surg Endosc. 2016 Oct;30(10):4330-4352	Population not relevant
Wang S, Zhou J, Cai JF. Traditional coronary artery bypass graft versus totally endoscopic coronary artery bypass graft or robot-assisted coronary artery bypass graft--meta-analysis of 16 studies. Eur Rev Med Pharmacol Sci. 2014;18(6):790-797	Inclusion of case series
Wang N, Zhou JJ, Phan S, Yan TD, Phan K. Robot-assisted Hybrid Coronary Revascularisation: Systematic Review. Heart Lung Circ. 2015 Dec;24(12):1171-1179	Inclusion of case series
Yanagawa F, Perez M, Bell T, Grim R, Martin J, Ahuja V. Critical Outcomes in Nonrobotic vs Robotic-Assisted Cardiac Surgery. JAMA Surg. 2015 Aug;150(8):771-777	Population not relevant

Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

Yang M, Wu Y, Wang G, Xiao C, Zhang H, Gao C. Robotic Total Arterial Off-Pump Coronary Artery Bypass Grafting: Seven-Year Single-Center Experience and Long-Term Follow-Up of Graft Patency. Ann Thorac Surg. 2015 Oct;100(4):1367-1373.	Comparison group not relevant

Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

Supplementary Table S3. GRADE assessment of RCAB vs MIDCAB

				Anticipated absolute effects	
Outcomes	**№ of participants (studies)**	**Certainty of the evidence (GRADE)**	**Relative effect (95% CI)**	**Risk with MIDCAB**	**Risk difference with RCAB**
Length of hospital stay	281 (3 observational studies)	⨁◯◯◯ VERY LOW [a,b,c]	-	not pooled	not pooled
Late MI	132 (1 observational study)	⨁◯◯◯ VERY LOW [a,d]	not estimable	16 per 1,000	16 fewer per 1,000 (16 fewer to 16 fewer)
Late stroke	132 (1 observational study)	⨁◯◯◯ VERY LOW [a,d]	not estimable	33 per 1,000	33 fewer per 1,000 (33 fewer to 33 fewer)
Overall survival	132 (1 observational study)	⨁◯◯◯ VERY LOW [a,d]	not estimable	902 per 1,000	902 fewer per 1,000 (902 fewer to 902 fewer)
Postoperative pain score	97 (1 observational study)	⨁◯◯◯ VERY LOW [c,e]	not estimable	-	**-**
Readmission rates	Not measured	**-**	-	-	-
Revascularization	184 (2 observational studies)	⨁◯◯◯ VERY LOW [a,d]	not pooled	not pooled	not pooled

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI).
CI= Confidence Interval; MI= Myocardial Infarction; MIDCAB= Minimally Invasive Direct Coronary Artery Bypass; RCAB= Robotic Coronary Artery Bypass
a. Lack of control for confounding variables; one study at high risk of selection bias; no information on surgeon's experience; b. Two studies reported significant differences and one found no statistical differences between RCAB and MIDCAB. The mean difference ranged from 1 to 7 days; c. Small sample size; d. Low event rate; e. Lack of control for confounding variables; high risk of performance bias; no information on surgeons experience

Supplemental Table S4. GRADE assessment of RCAB vs PA-CAB

				Anticipated absolute effects	
Outcomes	**№ of participants (studies)**	**Certainty of the evidence (GRADE)**	**Relative effect (95% CI)**	**Risk with PA-CAB**	**Risk difference with RCAB**
Length of hospital stay	107 (1 observational study)	⨁◯◯◯ VERY LOW [a,b]	not estimable		
Late MI	107 (1 observational study)	⨁◯◯◯ VERY LOW [a,c]	not estimable	21 per 1,000	21 fewer per 1,000 (21 fewer to 21 fewer)
Late stroke	Not measured	-	-	-	-
Overall survival	107 (1 observational study)	⨁◯◯◯ VERY LOW [a,c]	not estimable	1,000 per 1,000	1,000 fewer per 1,000 (1,000 fewer to 1,000 fewer)
Postoperative pain score	Not measured	-	-	-	-
Readmission rates	Not measured	-	-	-	-
Revascularization	107 (1 observational study)	⨁◯◯◯ VERY LOW [a,c]	not estimable	42 per 1,000	42 fewer per 1,000 (42 fewer to 42 fewer)

*The risk in the intervention group (and its 95% confidence interval) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI); CI= Confidence Interval; MI= Myocardial Infarction; PA-CAB= Port Access Coronary Artery Bypass; RCAB= Robotic Coronary Artery Bypass
a. No control for confounding variables; study at high risk of selection bias; b. Small sample size; c. Low event rate

Appendix 1 to Hammal F, Nagase F, Menon D, et al. Robot-assisted coronary artery bypass surgery: a systematic review and meta-analysis of comparative studies. *Can J Surg* 2020.

DOI: 10.1503/cjs.013318

Online appendices are unedited and posted as supplied by the authors.

Supplementary Table S5. Newcastle-Ottawa Scale assessment of the methodological quality of clinical studies

Study	Selection	Comparability	Outcome	Quality
Leyvi (2018) [7]	***		***	poor
Su (2018) [8]	**		*	poor
Leyvi (2016) [9]	**	**	***	fair
Raad (2016) [10]	**	**	***	fair
Ezelsoy (2015) [11]	***		**	poor
Zaouter (2015) [12]	***		***	poor
Poston (2008) [13]	*	**	***	poor
Bucerius (2002) [14]	*		*	Poor
Gong (2016) [15]	**		**	poor
Bachinsky (2012) [16]	***		***	poor
Jegaden (2011) [17]	**		*	poor
Whellan (2016) [18]	****		***	poor
Cavallaro (2015) [19]	***	**	**	good

Supplementary Table S6. Characteristics of procedure

Study	Surgical procedure	Number of grafts Mean±SD Median (range) [IQR]	Surgeons (n)	Surgeon experience	PCI description	HCR n (%)
RCAB vs C-CABG						
Leyvi (2018) [7] USA	RCAB: technique RADCAB, Off pump, graft: LITA C-CABG(on): On pump, grafts: NR	RCAB: 1.4±0.7 C-CABG(on): 3.5±1.1 P<0.001	Single surgeon performed all surgeries	NR	*Time:* 3 days after surgery	RCAB: 8 (29) C-CABG(on): 0 (0)
Su (2018) [8] Taiwan	RCAB: technique RADCAB, Off pump, grafts: LITA & LRA C-CABG: On pump: grafts: LITA and LRA	RCAB: 3 [2-3] C-CABG: 3 [3-3] p>0.05	NR	NR	NA	RCAB: 0 (0) C-CABG: 0 (0)
Leyvi (2016) [9] USA	RCAB: technique: RADCAB, Off pump, grafts: LITA C-CABG(on): On pump, grafts: NR	RCAB: 1.1±0.3 C-CABG(on): 3.1±0.8 P<0.001	RCAB: NR C-CABG(on): NR	RCAB: experienced C-CABG(on): NR	RCAB: same session: 2 (4); same admission: 24 (48); Other: 24 (48); C-CABG(on): NR	RCAB: 50 (35) C-CABG(on): 1 (1) P=NR
Raad (2016) [10] USA	RCAB: RADCAB, Off pump, graft: LITA C-CABG(on): On pump, grafts: NR	NR	NR	NR	NR	NR
Ezelsoy (2015) [11] Turkey	RCAB: RADCAB, Off pump, graft: LITA C-CABG(on): On pump, grafts: LITA	RCAB: 1 C-CABG(on): 1 P=NA	One surgical team performed all surgeries	NR	NA	RCAB: 0 (0) C-CABG(on): 0 (0)
Zaouter (2015) [12] France	RCAB: technique: TECAB, Off pump, grafts: LITA C-CABG(on): On pump, grafts: LITA	RCAB: 1 C-CABG(on): 1 P=NA	RCAB: single surgeon C-CABG(on): >1	NR	NR	RCAB: 1 (3); C-CABG(on): NR, P=NR
Poston (2008) [13] USA	RCAB: technique: RADCAB, Off pump, grafts: LITA & RA C-CABG(off): Off pump, grafts: LITA, RA, & SVG	RCAB: 1.9±0.4 C-CABG(off): 2.9±0.8, P=NR	Single surgeon performed all surgeries	NR	*Time:* same session *Type:* DES (sirulimus)	NR
Bucerius (2002) [14] Germany	RCAB: technique: RADCAB; Off pump, grafts: ITA C-CABG(on): On pump grafts: NR	RCAB: NR C-CABG(on): 2 to 3	NR	NR	NR	RCAB: NR C-CABG(on): NA
RCAB vs MIDCAB						
Gong (2016) [15] China	RCAB: technique: RADCAB, Off pump, grafts: LITA & SVG MIDCAB: Off pump, grafts: LITA and SVG	1 graft:** RCAB: 37 (52), MIDCAB: 46 (75) ≥2 grafts:** RCAB: 34 (48), MIDCAB: 15 (25) P=0.01	RCAB: one surgical team MIDCAB: NR	NR	*Time:* 5 to 14 days after surgery *Type:* DES (sirolimus)	RCAB: 34 (48) MIDCAB: 12 (20) P=NR
Bachinsky (2012) [16] USA	RCAB: technique: RADCAB, Off pump, grafts: ITA MIDCAB: Off pump, grafts: NR	RCAB: NR MIDCAB: 3.4±NR, P=NR	Single surgeon performed all surgeries	NR	*Time*: same session *Type:* DES (majority) and BMS	RCAB: 25 (100) MIDCAB: 0 (0)
Bucerius (2002) [14] Germany	RCAB: technique: RADCAB, Off pump, grafts: ITA MIDCAB: Off pump, grafts: ITA	NR	NR	NR	NR	NR
RCAB vs PA-CAB						
Jegaden (2011) [17] France	RCAB: technique: TECAB, Off pump grafts: NR PA-CAB: On pump, grafts: NR	NR	NR	NR	NR	NR
RCAB vs non-RCAB						
Whellan (2016) [18] USA	RCAB: technique: RADCAB and TECAB, On pump (22%) grafts: LITA Non-RCAB: On pump: 769,084 (80%) grafts: LITA	RCAB: 1 [1-2] Non-RCAB: 3 [3-4] P<0.001	Multiple	NR	NR	NR
Cavallaro (2015) [19] USA	Single bypass: RCAB: technique: RADCAB and TECAB, On pump: (8%), grafts: NR; Non-RCAB: On pump: 21 (8%) grafts: NR ≥2 bypass: RCAB: technique: RADCAB and TECAB, On pump: (34%), grafts: NR; Non-RCAB: On pump: (34%), grafts: NR	Single bypass: RCABG(n=275): 1; Non-RCABG (n=275): 1; P=NA ≥2 bypass RCAB(n=189): 2.6±0.9; Non-CAB(n=189): 2.6±0.8; P=0.80	Multiple	NR	NR	NR

*Study suggests at least 58 cases using LITA grafts; **Reported as n (%); BMS= Bare Metal Stent; CABG= Coronary Artery Bypass Grafting; C-CABG= Conventional Coronary Artery Bypass Grafting (median sternotomy); C-CABG (off) = Conventional Coronary Artery Bypass Grafting (median sternotomy) (off pump); C-CABG (on) = Conventional Coronary Artery Bypass Grafting (median sternotomy) (on pump); DES= Drug-eluting Stent; HCR= Hybrid Coronary Revascularization; IQR= Interquartile Range; ITA= Internal Thoracic Artery; LITA= Left Internal Thoracic Artery; LRA= Left Radial Artery; MIDCAB= Minimally Invasive Direct Coronary Artery Bypass; Non-RCAB= Non-robotic Coronary Artery Bypass; NA= Not Applicable; NR= Not Reported; PA-CAB= Port Access Coronary Artery Bypass; PCI= Percutaneous Coronary Intervention; RA= Radial Artery; RADCAB= Robot-assisted Direct Coronary Artery Bypass; RCAB= Robotic Coronary Artery Bypass; SD= Standard Deviation; SVG= Saphenous Vein Graft; TECAB= Totally Endoscopic Coronary Artery Bypass