Research Article



Multiple Arterial Bypass Graft Surgery Vs Drug-Eluting Stent in Patients with Three-Vessel or Left Main Coronary Artery Disease: A Meta-Analysis of Observational Studies

Yanwei Wang^{1,*}, Yutao Wu^{3,*}, Yanqin Li² and Xi Yang¹

¹Department of Cardiology, Ningbo Medical Treatment Center Lihuili Hospital, Ningbo 315000, PR China ²Department of Coronary Care Unit, Ningbo Medical Treatment Center Lihuili Hospital, Ningbo 315000, PR China ³Department of Cardiology, The First Affiliated Hospital, Zhejiang University, School of Medicine, Hangzhou 310003, PR China

***Corresponding Author:** Yanwei Wang, Department of Cardiology, Ningbo Medical Treatment Center Lihuili Hospital, 57 Xingning Road, Ningbo, 315000, Zhejiang, China, Tel: +86 13567931506; E-mail: wyw_zju@163.com

Yutao Wu, Department of Cardiology, The First Affiliated Hospital, Zhejiang University, School of Medicine, Hangzhou 310003, PR China

Received Date: July 21, 2023 Accepted Date: August 21, 2023 Published Date: August 24, 2023

Citation: Yanwei Wang, Yutao Wu, Yanqin Li, Xi Yang (2023) Multiple Arterial Bypass Graft Surgery Vs Drug-Eluting Stent in Patients with Three-Vessel or Left Main Coronary Artery Disease: A Meta-Analysis of Observational Studies. J Cardio Vasc Med 9: 1-13

Abstract

Background: The choice of multiple arterial bypass graft surgery (MAG) versus drug-eluting stent (DES) among patients with multivessel coronary artery disease (MCAD) or left main coronary artery disease (LMCAD) continues to be challenging.

Objectives: The aim of this study was to evaluate the efficacy and safety of MAG with DES- percutaneous coronary intervention (PCI) in patients with multivessel coronary artery disease or left main coronary artery disease.

Methods: PubMed, EMBASE and Clinical trials were systematically searched for studies which reported the clinical outcomes of MAG versus DES-PCI in patients with three-vessel or left main coronary artery disease. Clinical endpoints including all cause death, myocardial infarction (MI), stroke, repeat revascularization and major adverse cardiac and cerebrovascular events (MACCE) were assessed.

Results: From 2000 to 2023, 13 clinical studies comprising 17255 patients were identified. Pooled results shown similar safe-

©2023 The Authors. Published by the JScholar under the terms of the Crea-tive Commons Attribution License http://creativecommons.org/licenses/by/3.0/, which permits unrestricted use, provided the original author and source are credited. ty between MAG and DES-PCI after short-term follow up. While, MAG was associated with significant lower incidence of death from any cause, MI, repeat revascularization and MACCE with long-term follow up.

Conclusions: Among patients with multivessel coronary artery disease or left main coronary artery disease, MAG led to comparable clinical outcomes to PCI with short-term follow up, and shown superior clinical outcomes after long-term follow up.

Keywords: Multiple Arterial Bypass Graft Surgery; Percutaneous Coronary Intervention; Bilateral Internal Thoracic Arterial; Drug-Eluting Stent

Introduction

Optimal revascularization approaches for patients with multivessel coronary artery disease (MVCAD) or left main coronary artery disease (LMCAD) remain controversial despite multiple randomized trials and retrospective series [1,2]. The choice of coronary artery bypass graft surgery (CABG) versus percutaneous coronary intervention (PCI) among patients with MVCAD or LMCAD continues to be challenging. Overall, data from both randomized and observational studies suggest that CABG should be preferred over PCI in patients with MVCAD [3,4]. US and European guidelines recommend CABG for patients with three-vessel or two-vessel disease with proximal left anterior descending CAD (class I); while PCI recommend as an option of uncertain benefit (class IIb) in this population [5,6]. As a less invasive approach, PCI benefit from earlier recovery, lower periprocedural risk, smaller periprocedural MI, less risk of procedural complications and periprocedural bleeding, was usually considered in patients unsuitable for operation. Recently, advances in PCI techniques, such as physiologic assessment of lesions, intravascular imaging guidance, use of a new-generation stent have resulted in improved degree of revascularization [7]. PCI with stent implantation for LM-CAD had become technically feasible and had shown favorable clinical outcomes, especially in people with low or intermediate SYNTAX scores [8]. Improved long-term mortality with drug-eluting stent (DES)-PCI helped to drive increased use of PCI in the treatment. What is more, PCI has achieved recognition as a reasonable therapeutic alternative to CABG for unprotected LMCAD [9]. In a recent pooled analysis of 11 randomized trials comparing CABG with PCI, 5-year all-cause mortality was not significantly lower in CABG group without diabetes [4]. On the other hand,

CABG offers the advantage of bypassing long segments of disease or diffuse disease and complete revascularization. Which is a more durable procedure with less repeat revascularization. CABG has also evolved significantly over the last two decades with increasing utilization of multiple arterial grafts (MAG) and more sophisticated surgical revascularization techniques [10]. Compelling evidence has rapidly accumulated over the past decade suggesting a second arterial graft improves intermediate and long-term outcomes substantially compared with those of single arterial-CABG [11]. It's important to consider different surgical techniques when comparing outcomes of CABG with PCI. To further confirm the efficacy of MAG over DES-PCI, we performed meta-analysis focused on contemporary outcomes after MAG or DES-PCI in patients with MVCAD and/or LM-CAD.

Methods

Systematic database search was performed on PubMed, EMBASE and Clinicaltrials.gov for relevant articles. The key words we used for screening included following terms: "percutaneous coronary intervention", "PCI", "drug-eluting stent", "DES", "multiple arterial bypass graft", "MAG", "bilateral internal thoracic arterial" and "BITA". The references of relevant studies and reviews, editorials, and letters, together with related conference abstracts were also searched.

Inclusion criteria for study selection were clinical trials directly comparing clinical outcomes between PCI using DES and MAG in patients with left main coronary artery disease or multivessel coronary artery disease. All titles and abstracts were screened. If either reviewer judged that the study could meet the inclusion criteria, we assessed eligibility using the full text. We excluded studies that were non-human or without clinical data. We also excluded studies using bare metal stent or balloon angioplasty mixed with DES in PCI group.

The efficacy endpoints of the analysis include: (a) Death from any cause, (b) Cardiovascular death, (c) non cardiovascular death, (d) Myocardial infarction (MI), (e) Stroke, (f) Repeat revascularization and (g) Major adverse cardiac and cerebrovascular events (MACCE). All of them were defined according to respective study definition.

Two investigators independently assessed reports for eligibility at title and/or at abstract level, with divergences resolved by a third reviewer; studies that met inclusion criteria were selected for further analysis. The risk of bias was evaluated by the same two reviewer reviewers, in accordance with The Cochrane Collaboration methods [12].

Data was analyzed using the Review Manager 5.3 statistical software. Reported event frequencies were used to calculate risk ratios (RR) with 95% confidence intervals (CI). Heterogeneity of the trial results was quantified with the Chi² heterogeneity statistic, inconsistency assessed by means of I². Results were reported as the p value of the Chi² test (p <0.05 for heterogeneous results) and percent of the

 I^2 . Interpretation of the I^2 was made by assigning attribute of low, moderate, and high in case of 0–25%, 50–75% and more than 75%, respectively. The trials included in the meta-analysis had heterogeneous patient cohorts with differing clinical presentations, treatment indications, coronary anatomy, and procedural characteristics, we used a random effects model based on associated heterogeneity, with the latter used when I^2 >50%. To study the relevance of publication bias, funnel plots were constructed plotting the trial results against their precision.

Results

After deduplication, screening of titles and abstracts, and full text review based on inclusion and exclusion criteria, 13 observational studies involving 17255 patients were qualified for the analysis [13-25] (Figure1). The detailed characteristics of the included studies are shown in Supplementary table1. Studies varied according to the year published clinical presentation and duration of follow up. In general, 9292 (53.9%) patients were treated with DES-P-CI, while 7963 (46.1%) treated with MA-CABG. 7 trials using bilateral internal thoracic arterial (BITA) in CABG arm. In PCI with DES implantation, 4 studies only used secondgeneration DES.

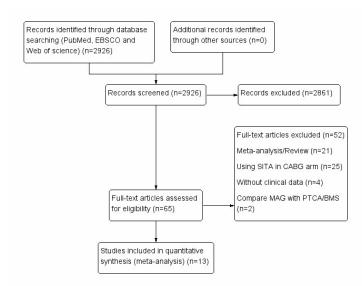


Figure 1: Flowchart of study selection

We first investigated the short-term clinical outcomes (in-hospital or 30 days) of MAG and PCI. MAG group was associated with non-significantly lower incidence of all-cause death (RR 0.67; 95%CI: 0.34-1.31; p=0.24; I^2 =61%), MI (RR 0.82; 95%CI: 0.35-1.94; p=0.66; I^2 =66%). However, MAG might increase the rate of stroke with no

significant difference (RR 2.86; 95%CI: 0.84-9.78; p=0.09; I^2 =0%), MACCE (RR 1.48; 95%CI: 0.94-2.34; p=0.09; I^2 =0%) and significant increase the incidence of bleeding

events (RR 3.14; 95%CI: 1.78-5.53; p<0.0001; I^2 =0%) (Figure 2).

MAG PCI Risk Ratio Risk Ratio Benedeto 2016 4 443 0 403 126 % 0.50 [015, 165] MH, Random, 95% CI Benedeto 2016 1 443 0 403 126 % 0.50 [015, 165] MH, Random, 95% CI Habi 2015 1 546 1 546 1.74 % 0.29 [013, 057] Herz 2005 1 113 0 113 0.74 3.76 % 0.00 [012, 22.87] Herz 2005 1 97 9 5527 100.05, 1539] 1.46 [012, 0.5, 273] Thuis 2018 3 217 9 948 12.6% 1.46 [0.40, 5.33] Total (95% CI) 3977 9 5527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 3977 9 5527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 3977 9 5527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 3977 9 2527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 3 413 10 113 14 54% 10.21 [0.21, 1.5 (0.2]	All cause deat	h						
Benedetio 2016 4 483 28 83 128% 0.500 [0.1, 166] Habb 2015 1 546 1 546 17.4% 1.000 [0.6, 15.96] Habb 2015 1 546 1 546 1.7% 1.000 [0.6, 15.96] Her 2005 1 113 0 113 3.7% 3.000 [1.2, 72.87] Her 2006 1 543 103 651 77.9% 1.24 [1.56, 7.07] Thuis 2018 9 103 661 77.9% 1.24 [1.56, 7.07] Thuis 2018 9 103 661 77.9% 1.24 [1.56, 7.07] Thuis 2018 9 103 617 (2.5%, 1.77) 100 Total events 104 124 124 126 Her 2005 4 113 113 164 % 132 [0.31, 5.62] Total events Total events Total events 100 100 Favours MAG Foroba 2022 6 1027 8 1027 155 (0.5, 619 100 100 Total events 30 68 1028 127 (2.5%, 0.78) [0.26, 2.16] 100 100<		MAG						
Bianco 2023 Planco 2025 Planco 2025 Planc	Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95%	CI M-H, Random, 95% CI
Habb 2015 1 546 1 546 4 7% 1.00 [0.6] (5.95] Her 2005 1 113 0 113 0.7% 3.00 [0.12, 72.87] Her 2005 1 87 0 87 Not estimable Locker 2004 15 4 39 10 363 77 9% 1.24 [0.56, 7.07] Her 2005 1 4 226 3 271 11.0% 1.60 [0.36, 7.07] Thuis 2018 3 127 9 948 12.6% 1.46 [0.40, 5.33] Total 695 (C) 3979 5527 100.0% 0.67 [0.34, 1.31] Total events 4 124 Heterogeneity. Tau" = 0.49, Chi" = 17.75, df = 7 ($P = 0.01$), $P = 61\%$. Total events 4 124 Heterogeneity. Tau" = 0.49, Chi" = 17.75, df = 7 ($P = 0.01$), $P = 61\%$. Total events 4 124 Heterogeneity. Tau" = 0.49, Chi" = 17.75, df = 7 ($P = 0.01$), $P = 61\%$. Total events 4 134 124 Heterogeneity. Tau" = 0.49, Chi" = 11.88, df = 4 ($P = 0.02$), $P = 65\%$. Total events 10 de Vents 30 66 Heterogeneity. Tau" = 0.60, Chi" = 11.88, df = 4 ($P = 0.02$), $P = 66\%$. Total events 30 66 Heterogeneity. Tau" = 0.60, Chi" = 11.88, df = 4 ($P = 0.02$), $P = 66\%$. Total events 30 66 Heterogeneity. Tau" = 0.60, Chi" = 11.88, df = 4 ($P = 0.02$), $P = 66\%$. Total events 2 0 d 4 ($P = 0.60$). Stroke MACCE MAC	Benedetto 2016	4	483	8	483	13.6%	0.50 [0.15, 1.6	i5] • • •
Her 2005 1 113 0 113 3.7% 3.00[01,2,72,87] Her 2006 0 87 0 87 0 87 0 brit estimable Lacker 2004 15 439 10 363 17.9% 1.24 (0.56, 2.73] Moshword: 2012 4 226 3 2.71 110% 1.60 (0.36, 2.73] Total events 3 217 9 948 12.6% 1.46 [0.40, 5.33] Total events 44 124 Heterogeneity: Tau" = 0.48; Chi" = 17.75; df = 7 (P = 0.01); P = 61% Total events 44 124 Heterogeneity: Tau" = 0.48; Chi" = 17.75; df = 7 (P = 0.01); P = 61% Total events 44 13 3 113 16 4.4% 1.33 [0.31, 562] Locker 2005 4 113 3 113 16 4.4% 1.33 [0.31, 562] Locker 2005 4 113 3 113 16 4.4% 1.33 [0.31, 562] Locker 2005 4 113 3 113 16 4.4% 1.33 [0.31, 562] Locker 2005 4 113 3 217 19 948 2.76% 1.55 [0.37, 1.94] Her 2005 4 113 3 113 16 4.4% 1.33 [0.31, 562] Locker 2004 3 439 15 353 19.2% 0.01 7.05 [0.57, 1.94] Her 2005 4 113 0 113 6 4.4% 1.33 [0.31, 562] Locker 2004 3 439 15 353 19.2% 0.01 7.05 [0.57, 1.94] Her 2005 1 22 2 2722 100.0% 0.82 [0.35, 1.94] Her 2005 1 22 2 17 6 942 27 (P = 0.50); P = 66% Total events 30 6 67 Total events 10 1 22 17 9 942 27 (P = 0.50); P = 66% Total events 10 1 22 17 9 943 15 548 9.00 [0.48, 166.71] Her 2005 1 113 0 113 0 113 0 1544 100.0% 2.86 [0.84, 9.78] Total events 30 6 65 % 10 100 (1.2, 7.287] Total events 10 100 Favours MAG Favours PCI Stroke MAG PCI Fisk Ratio MAG Favours MAG Favours PCI MAG PCI Fisk Ratio MAG PCI	Bianco 2023	7	838	24	838	17.4%	0.29 [0.13, 0.6	i7] — • • • • • • • • • • • • • • • • • •
Here 2006 0 87 0 87 179% 124 (56, 73) Moshkowitz 2012 4 228 3 271 11.0% 160 (0.3, 7.07) Thuis 2018 3 217 9 948 12.6% 1.46 (0.40, 5.33) Total (95% Ct) 3979 5527 100.0% 0.67 (0.34, 1.31) Total events 4 124 Heterogeneity Tau"= 0.48 (Chif = 17.75, cfi = 7 (P = 0.01); P = 61%. Test for overall effect. Z = 1.18 (P = 0.24) MI MI Mag PCI Risk Ratio Study of Subarous Pcnts Total Events Total Weight MH, Random, 95% CI Heterogeneity, Tau"= 0.60, Chif = 11.88, dfi = 4 (P = 0.02); P = 65%. Total (95% Ct) 2022 2722 100.0% 0.82 [0.35, 1.94] Total (95% Ct) 2022 2722 100.0% 0.82 [0.37, 1.94] Total (95% Ct) 2022 2722 100.0% 0.82 [0.37, 1.94] Total (95% Ct) 2022 2722 100.0% 0.82 [0.37, 1.94] Total (95% Ct) 31 154 100.0% 2.86 [0.84, 9.78] Total (95% Ct) 813 1544 100.0% 2.86 [0.84, 9.78] Total (95% Ct) 813 1544 100.0% 2.86 [0.84, 9.78] Total (95% Ct) 813 1544 100.0% 2.86 [0.84, 9.78] Total (95% Ct) 124 177 6 948 695% Ct MH, Fixed, 95% Ct MH, Fixed,	Habib 2015	1	546	1	546	4.7%	1.00 [0.06, 15.9	15]
Lacker 2004 15 439 10 363 17.9% 124 [056, 273] Machicoviz 2012 4 226 3 271 11.0% 160 [03, 7.07] Raja 2018 9 1030 69 1878 19.0% 0.24 [012, 0.47] Thuijs 2018 3 217 9 948 12.6% 146 [0.40, 5.3] Total (95% CI) 3979 5527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 3979 5527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 3979 5527 100.0% 0.67 [0.34, 1.31] MI MAG PCI Risk Ratio Risk	Herz 2005	1	113	0	113	3.7%	3.00 [0.12, 72.8	17]
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Herz 2006	0	87	0	87		Not estimat	le
Raja 2018 9 1030 69 1878 19.0% 0.24 (p12, 0.47) Thuijs 2018 3 217 9 948 12.6% 1.46 (p.40, 5.33) Total (95% CI) 39.79 5527 100.0% 0.67 (0.34, 1.31) Total (95% CI) 39.79 5527 100.0% 0.67 (0.34, 1.31) MI MAG PCI Risk Ratio Risk Ratio Study or Subgroup Fevrours Int Add 133 10.4 (95% CI) 10.9 100 Locker 2004 3 439 15 353 12.2% (0.24, 5.88) Mochabitiz 2012 3 22.6 3 271 15.2% 12.0% (0.24, 5.88) Total (95% CI) 202.2 272.2 100.0% 0.82 (0.35, 1.94) Optimized MAG PCI Risk Ratio Risk Ratio Stroke MAG PCI Risk Ratio Risk Ratio Study or Subgroup Pewents Total (95% CI) 20.22 272.2 10.04, (7.27, 7.7) Total (95% CI) 813 154.4 100.04, (0.68, 10.84, 17.1) 10.01 100 100	Locker 2004	15	439	10	363	17.9%	1.24 [0.56, 2.7	3]
Thuis 2018 3 217 9 948 12.6% 1 46 [0.40, 5.3] Total (95% Ch) 3979 5527 100.0% 0.67 [0.34, 1.31] Total events 4 124 Heterogeneity Tau [*] = 0.49, ChP=17.75, df = 7 (P = 0.01); P = 61% Test for overall effect Z = 1.18 (P = 0.24) MI MI MI MAG PCI Risk Ratio Study or Subgroup Events Total Venth MH, Random, 95% Cl Heterogeneity Tau [*] = 0.40; ChP = 11.26, df = 1 (P = 0.52); P = 0% Total (95% Ch) 2022 21.5 % 0.75 [0.26, 2.15] Thuis 2018 14 217 37 948 27.6% 1.65 [0.13, 3.0] Total (95% Ch) 2022 7 15.2% 0.75 [0.26, 2.15] Thuis 2018 14 217 37 948 27.6% 1.65 [0.13, 3.0] Total (95% Ch) 2022 7 100.0% 0.82 [0.35, 1.94] Total (95% Ch) 2022 7 100.0% 0.82 [0.35, 1.94] Total (95% Ch) 2022 21.7 6 948 27.6% 1.65 [0.13, 3.00] Total (95% Ch) 2022 21.7 6 948 27.6% 0.00 [0.49, 166.71] Total (95% Ch) 813 1544 100.0% 2.86 [0.84, 9.78] Thuis 2018 2 217 6 948 69.1% 1.46 [0.30, 7.17] Total (95% Ch) 813 1544 100.0% 2.86 [0.84, 9.78] Total events 7 6 Heterogeneity ChP = 1.28, df = 2 (P = 0.53); P = 0% Test for overall effect Z = 1.68 (P = 0.09) MACCE MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MH, Fixed, 955 Cl MAG Favours MAO Favours PCI MAG Favours MAO Favours PCI 100 Total events 7 6 Heterogeneity ChP = 0.28, df = 1 (P = 0.59); P = 0% Test for overall effect Z = 1.67 (P = 0.09) MAG Favours MAO Favours PCI Mageneity 2 20 6 2 71 7.5% 100.0% 1.48 [0.94, 2.76] Total events 2 2 55 Cl MAG Favours MAO Favours PCI 100 Total events 7 2 6 2 55% Cl MAG Favours MAO Favours PCI MAG Favours MAO Favours PCI MAG Favours MAO Favours PCI Total events 7 2 6 7 7 7 56% 100.0% 1.48 [0.94, 2.76] Total events 7 2 6 7 7 7 57% 100.0% 1.48 [0.94, 2.76] Total events 7 2 7 7 75% 100.0% 1.48 [0.94, 2.76]	Moshkovitz 2012	4	226	3	271	11.0%	1.60 (0.36, 7.0	17]
Total (95% CI) 3979 5527 100.0% 0.67 [0.34, 1.31] Total (95% CI) 24 124 Heterogeneity: Tate - 0.49, CPR = 177, 5, df = 7, CP = 0.01); P = 61%. 0.01 0.1 0.1 10 MI MAG PCI Risk Ratio Risk Ratio Risk Ratio Risk Ratio Lacker 2004 3 439 15 330 12,26 1,27 1,01 0.01 0.1 0.01 0.1 0.01	Raja 2018	9	1030	69	1878	19.0%	0.24 [0.12, 0.4	7
Total events 44 124 Heterogeneity: $1 = 0.48$, Ch ² 17, 75, df = 7, (P = 0.01); (P = 61%, Testfor overall effect Z = 1.18 (P = 0.24) MI MAG PCI Risk Ratio Study or Subgroup Events Total Events Total Weight MLR Random, 95% CI Her 2005 4 113 3 113 16.4% 133 (031, 5.82) Locker 2004 3 439 15 363 19.2% 0.171 [005, 057] Her 2005 4 113 2 21.5% 0.171 [005, 057] Her 2005 1 4 217 8 1027 21.5% 0.751 [0.26, 25.19] Total events 30 66 Heterogeneity: Tau ² = 0.60, Ch ² = 11.88, df = 4 (P = 0.02); P = 66% Total events 30 67 Heter 2005 1 113 0 113 15.5% 30.01 [0.4, 5.56] Stroke MAG PCI Risk Ratio Study or Subgroup Events Total Events Total Weight MLR Rator Favours MAO Favours PCI 100 Stroke MAG PCI Risk Ratio Stroke MAG PCI Risk Ratio Stroke MAG PCI Risk Ratio Study or Subgroup Events Total Events Total Weight MLR (B (0.3), 717) Total events 7 6 Heterogeneity: Ch ² = 1.28, df = 2 (P = 0.53); P = 0% Total events 7 6 Heterogeneity: Ch ² = 1.28, df = 2 (P = 0.53); P = 0% Total events 7 6 Heterogeneity: Ch ² = 1.28, df = 2 (P = 0.53); P = 0% Total events 7 7 46 946 655% CI MACCE MAG PCI Risk Ratio MAG Favours MAO Favours PCI MACCE MAG PCI Risk Ratio MAG Favours MAG Favours PCI MAG PCI Risk Ratio MAG Favours MAG Favours PCI MACCE Risk Ratio MAG Favours MAG Favours PCI MAG PCI Risk Ratio MAG Favours MAG Favours PCI MAG Favours MAG Favours PCI MAG PCI Risk Ratio MAG Favours MAG Favours PCI MAG Favours MAG Favours PCI Total events 20 55 Total events 20 71 7 46 9446 55% CI MAG Favours MAG Favours PCI MAG Favours MAG Favours PCI MAG Favours MAG Favours PCI Total events 21 7 22 71 75% 180 180 (0.3) (1.61 10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10.44, 2.24 10.10, 10.1, 10.1, 10.1, 10.1, 10.1, 10.1, 10.1,	Thuijs 2018	3	217	9	948	12.6%	1.46 [0.40, 5.3	aj
Heterogeneity: Tay ² = 0.49, ChP ² = 17.75, df = 7 (P = 0.01); P = 61%. Testfor overall effect: Z = 1.18 (P = 0.24) MI MI MI MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Random, 95% CI Heterogeneity: Tay ² = 0.22, 226 3 2.271 15.2% 0.75 (0.26, 2.15] Thuis 2018 14 217 37 948 27.6% 1.65 (0.91, 3.00] Total effect: Z = 0.44 (P = 0.62); P = 66% Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI Heterogeneity: Tay ² = 0.60; ChP ² = 11.88, df = 4 (P = 0.02); P = 66% Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI Heterogeneity: Tay ² = 0.60; ChP ² = 11.88, df = 4 (P = 0.02); P = 66% Stroke MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI Heterogeneity: ChP ² = 1.28, df = 2 (P = 0.53); P = 0% Testfor overall effect: Z = 1.68 (P = 0.09) MACCE MACCE MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI MH, Fixed, 95% CI Heterogeneity: ChP ² = 1.28, df = 2 (P = 0.53); P = 0% Testfor overall effect: Z = 1.68 (P = 0.09) MACCE MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI MH, Fixed, 95% CI Heterogeneity: ChP ² = 1.28, df = 2 (P = 0.53); P = 0% Testfor overall effect: Z = 1.68 (P = 0.09) MACCE MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI MAG Favours MAO Favours PCI MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI MAG Favours MAO Favours PCI MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI MAG Favours MAO Favours PCI MAG Favours MAO Favours PCI MAG PCI Risk Ratio Study or Subgroup Cevents Total Venth MH, Fixed, 95% CI MAG Favours MAO Favours PCI MAG Favour	Total (95% CI)		3979		5527	100.0%	0.67 [0.34, 1.3	1] 🔶
Testfor overall effect: Z = 1.18 (P = 0.24) 0.01 0.1 0.1 1.0 1.0 MI MAG PCI Risk Ratio Risk Ratio Risk Ratio Risk Ratio Locker 2004 3 439 15 383 19.2% 0.17 0.10 0.1	Total events	44		124				
Testfor overall effect: Z = 1.18 (P = 0.24) 0.01 0.1 0.1 1.0 1.0 MI MAG PCI Risk Ratio Risk Ratio Risk Ratio Risk Ratio Locker 2004 3 439 15 383 19.2% 0.17 0.10 0.1	Heterogeneity: Tau ² =	= 0.49; Chi	² =17.	75, df = 7	(P = 0.	.01); I ² = 6	61%	
MI MAG PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Events Total Weight M.H. Random, 95% CI Her 2005 4 113 3 113 16.4% 133 (0.31, 5.82) Locker 2004 3 439 15 363 (1.2%) 120 (0.24, 5.89) Moshkowitz 2012 3 226 3 271 (15.2%) 120 (0.24, 5.89) Total (95% CI) 2022 2722 (100.0%) 0.82 (0.35, 1.94) 0.01 0.1 Hetrogeneity Tau*= 0.60; ChP=11.88, df=4 (P=0.02); P= 66% 0.01 0.1 0.1 0.1 10 Stroke MAG Pcuts Risk Ratio Risk Ratio Risk Ratio Study or Subgroup Fewrits Total (Persits 100 (4.9, 166.71) 0.01 0.1 0.1 0.01 0.1 100 Favours MAO Pavours MAO 13 15.5% 0.00 (4.9, 166.71) 100 100 100 100 100 100 100 100 100 100 100								
MAG PCI Risk Ratio Risk Ratio Risk Ratio Study of Subgroup Events Total Weight M.H. Random, 95% CI M.H. Random, 95% CI Herz 2005 4 113 3 113 16.4% 1.33 (0.31, 5.22) Locker 2004 3 439 15 963 19.2% 0.17 (0.05, 0.57) Moshkoutz 2012 3 226 3 271 15.2% 0.01 (0.5, 0.57) Total (95% CI) 2022 2722 100.0% 0.82 (0.35, 1.94) Total (95% CI) 2022 2722 100.0% 0.82 (0.35, 1.94) Total (95% CI) 2022 2772 100.0% 0.82 (0.35, 1.94) Hetrogone/K, Tau* 0.80, Ch*= 11.88, df = 4 (P = 0.02), P = 66% 0.01 0.1 1.0 Total (95% CI) 2021 4 (P = 0.80) Fisk Ratio Risk Ratio Study or Subgroup Feents Total Weight M.H. Fixed, 95% CI M.H. Fixed, 95% CI Herz 2005 1 113 0 13 15.5% 30.01 0.4, 72.87]	м							
Her 2005 Locker 2004 4 113 113 16.4% 113 [0.31, 5.82] Locker 2004 3 439 15 363 19.2% 0.17 [0.05, 0.7] Moshkowit 2012 3 226 3 271 15.2% 120 [0.24, 5.86] Total (95% Ch 2022 6 1027 8 1027 2 15% 0.07 5[0.25, 216] 100 101 0.1 101 0.1 101 0.1 101 0.1 101 0.1 100 100 100 100 100 100 100	1411	MAG	;	PC			Risk Ratio	Risk Ratio
Locker 2004 3 439 15 363 19.2% 0.17[005;057] Moshkow: 2012 3 226 3 271 15.2% 0.75[0.26,2.15] Thuis 2018 14 217 37 948 27.6% 165[0.91,3.00] Total events 2022 6 1027 8 1027 21.5% 0.75[0.26,2.15] Total events 30 2022 8 2722 100.0% 0.82[0.35,1.94] Total events 44 (P = 0.66) Stroke Stroke MAG PCI Risk Ratio Risk Ratio Risk Ratio Risk Ratio Risk Ratio Risk Ratio Total events 7 6 6 948 69.1% 1.46 [0.30,7.17] Total events 7 7 6 948 69.1% 1.46 [0.30,7.17] Total events 7 7 6 948 69.1% 1.46 [0.30,7.17] Total events 7 7 6 7 100 [Vents Total Vents Total Vents MAK Ratio Risk Ratio Ris	Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95%	CI M-H, Random, 95% CI
Locker 2004 3 439 15 363 19.2% 0.17 [05, 0.57] Moshkowit 2012 3 226 3 271 15.2% 0.75 [0.26, 2.15] Thuis 2013 14 217 37 948 27.6% 165 [0.91, 3.00] Total events 30 62 2722 100.0% 0.82 [0.35, 1.94] Total events 30 62 2722 100.0% 0.82 [0.35, 1.94] Heterogeneity: Tau ⁶ = 0.60; Ch ⁴ = 1.88, df = 4 (P = 0.02); P = 66%, Test for overall effect $Z = 0.44$ (P = 0.65) Stroke Stroke NAG PCI Risk Ratio Study or Subgroup Events Total Events Total Weight MLA, Fixed, 95%, CI Heterogeneity: Ch ⁴ = 1.88, df = 2 (P = 0.53); P = 0% Total events 7 6 Heterogeneity: Ch ⁴ = 1.88, df = 2 (P = 0.53); P = 0% Test for overall effect $Z = 1.68$ (P = 0.09) MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI Heterogeneity: Ch ⁴ = 1.88, df = 2 (P = 0.53); P = 0% Test for overall effect $Z = 1.68$ (P = 0.09) MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI MAG PCI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI Risk Ratio Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Zeents Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Study or Subgroup Events Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Zeents Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Zeents Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Study or Subgroup Events Total Weight MLA, Fixed, 95%, CI Magnotic Study or Subgroup Events Total Weight MLA, Fixed, 95%, CI Magnotic Zeents Total Zeents Total Weight MLA, Fixed, 95%, CI Magnotic Rest 201 3 226 2 2 7 1 7.5% 100 1 0.1 0.1 0.1 0.1 0.1 0.1 0.0 0.0 0.	Herz 2005	4	113	3	113	16.4%	1.33 (0.31, 5.8	21
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Locker 2004	3	439	15	363	19.2%		
Roch 2022 6 1027 21 5% 0.75 (0,22,215) Thuis 2018 14 217 37 948 27.6% 165 (0,91,3.00) Total (95% C) 2022 2722 100.% 0.82 (0.35, 1.94) Total (95% C) 2022 2722 100.% 0.82 (0.35, 1.94) Total (95% C) 2022 2722 100.% 0.82 (0.35, 1.94) Total (95% C) MAG PCI Risk Ratio Risk Ratio Study or Subaroup Events Total 15% 30.00 (0,47, 166.71) Text 2005 113 0.13 15% 30.00 (1,27, 287) Total (95% C) 813 1544 100.0% 2.86 (0.84, 9.78) Total (95% C) 813 1544 100.0% 2.86 (0.84, 9.78) Total (95% C) 813 1544 100.0% 2.86 (0.84, 9.78) MAG PCI Risk Ratio Risk Ratio Risk Ratio Study or Subaroup Centrs Total Weinht M.4. Fixed, 95% CI M.4. Fixed, 95% CI MAG PCI Risk Ratio Risk Ratio M.4. Fixed, 95% CI M.4. Fixed, 95% CI <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
Thuis 2018 14 217 37 948 27.6% 165 [0.91, 3.00] Total (95% CI) 2022 2722 100.0% 0.82 [0.35, 1.94] Total (95% CI) 2022 2722 100.0% 0.82 [0.35, 1.94] Total (95% CI) 2022 2722 100.0% 0.82 [0.35, 1.94] Stroke MAG PCI Risk Ratio Risk Ratio Study or subgroup Events Total (95% CI) 913 155% 0.00 [0.49, 166.71] Herz 2005 1 113 0 131 155% 0.00 [0.49, 166.71] Herz 2005 1 113 0 131 155% 0.00 [0.49, 166.71] Total (95% CI) 913 1544 100.01 2.86 [0.84, 976] Total (95% CI) 913 1544 100.01 0.1 10 Total (95% CI) 913 1544 100.02 2.86 [0.84, 976] MACCE MAG PCI Risk Ratio Risk Ratio Study or Subgroup Events Total (95% CI) 1110.27 9 1027 Total (95% CI) 1244 1975 100.0% 1.48 [0.94, 2.34] Total (95% CI) 1244 1975 100.0% 1.48 [0.94, 2.34] <								
Total events 30 66 Heleropenety 74 69 0.02); P = 66%, Stroke 0.01 0.1 10 100 Stroke MAG PCI Risk Ratio Risk Ratio Benedetto 2016 4 483 15.5% 9.00 [0.49, 166.71] Her 2005 113 0 13 15.5% 30.00 [1.2, 7.287] Total events Total 217 6 9.48 69.1% 1.46 [0.30, 7.17] Total events 7 6 9.48 69.1% 1.46 [0.30, 7.17] Total events 7 6 9.48 69.1% 1.46 [0.30, 7.17] Total events 7 6 9.48 69.1% 1.46 [0.30, 7.17] Total events 7 6 9.48 69.1% 1.46 [0.30, 7.17] MACCE MAG PCI Risk Ratio Risk Ratio Study or Subgroup Pewents Total Weight M.4, Fixed, 95% Cl M.4. Fixed, 95% Cl Mochard PCI Risk Ratio Risk Ratio Mis Ratio Study or Subgroup Pewent								
Total events 30 66 Heterogeneity 74 = 600 (Total (95% CI)		2022		2722	100.0%	0 82 10 35 1 9	41
Heterogeneky: Ch ² = 0.26, Ch ² = 11.88, df = 4 (P = 0.02); P = 66%. Testforoverall effect. Z = 0.44 (P = 0.66) Stroke MAG PCI Risk Ratio MAG PCI Risk Ratio Study or Subgroup Levents Total Versith MH, Fixed, 95% CI Favours MAG Favours PCI Total (95% CI) 211 1027 34.44 (S 10.24, 12.2.44 Total versits 28 Total (95% CI) 1244 1975 100.0% 1.48 [0.94, 2.34] Total versits Ratio Risk Ratio Risk Ratio Risk Ratio MAG PCI Risk Ratio Risk Ra		20	LOLL	66	LILL	100.070	0.02 [0.00, 1.0	-1
Test for overall effect: Z = 0.44 (P = 0.66) 0.01 0.1 100 Stroke MAG PCI Risk Ratio Study or Subgroup Events Total (PS% CI) 813 15.5% 0.00 (1, 12, 78.7) Total (PS% CI) 813 15.44 100,07,17 100 Total (PS% CI) 813 15.44 100,07,17 Total (PS% CI) 813 15.44 100,07,286 MACCE Risk Ratio Risk Ratio Study or Subgroup Events Total Weight M4. Fixed, 95% CI MACCEE MAG PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Weight M4. Fixed, 95% CI MACCEE MAG PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Weight M4. Fixed, 95% CI Mochae 22 (P = 0.53); P = 0% 100 (P = 0.59; CI Powours MAG Favours MAG Total (P5% CI) 124 1975 100.0% 1.48 [0.94, 2.76] Total (P5% CI) 124 1975 100, 0.0; 1.67] Total events 20 55 3.42 [1.80, 6.2] Mag or Subgroup Events 701 100 Total (P5% C					<i>m</i> 0	0.00-17 0	0.00	
Particular since Particulare Since Partex Since Particular Since Particular Since Particul					(P = 0.	.02); F = 6	00.00	0.01 0.1 1 10 10
Stroke MAG PCI Risk Ratio Risk Ratio Study or Subgroup Revel to 2016 4 493 OI 104 Weight M.H. Erked, 95% CI ML* Ratio Risk Ratio Benedetio 2016 4 493 0 ML* Ratio ML* Ratio ML* Ratio Total events 10 016 946 016	lest for overall effect.	Z = 0.44 (P = 0.6	56)				Favours MAG Favours PCI
MAG PCI Risk Ratio Risk Ratio Study or Subaroup Events Total Verints Total Total Verints Total	0. 1							
Study or Subgroup Events Total Venits Total Weight M.H. Fixed, 95% CI Beneditio 01 443 0 483 155% 000 (49, 166 7)1 Her 2005 1 113 0 133 155% 000 (49, 166 7)1 Her 2005 1 113 0 515% 000 (49, 166 7)1 Total (95% CI) 813 1544 100.0% 2.86 (0.84, 9.78) Total (95% CI) 813 1544 100.0% 2.86 (0.84, 9.78) Heterogeneity: Ch*= 1.28, dr2 (P = 0.53); P = 0% 6 101 0.1 1.0 Featorist Total Events Total (95% CI) 11027 94.4% 122 (051, 2.94) Total (95% CI) 1244 1975 100.94, 2.54 141 (0.94, 2.76) Total (95% CI) 1244 1975 100.94, 2.65 M.H. Fixed, 95% CI Hetrogeneity: Ch*= 0.28, dr1 (P = 0.59); P = 0% 1.48 (0.94, 2.34] 0.01 0.1 1.0 Total (95% CI) 1244 1975 100.09, 3.67 Hetrogeneity: Ch*= 0.2	Stroke							
Study or Subgroup Events Total Venits Total Weight M.H. Fixed, 95% CI Beneditio 01 443 0 483 155% 000 (49, 166 7)1 Her 2005 1 113 0 133 155% 000 (49, 166 7)1 Her 2005 1 113 0 515% 000 (49, 166 7)1 Total (95% CI) 813 1544 100.0% 2.86 (0.84, 9.78) Total (95% CI) 813 1544 100.0% 2.86 (0.84, 9.78) Heterogeneity: Ch*= 1.28, dr2 (P = 0.53); P = 0% 6 101 0.1 1.0 Featorist Total Events Total (95% CI) 11027 94.4% 122 (051, 2.94) Total (95% CI) 1244 1975 100.94, 2.54 141 (0.94, 2.76) Total (95% CI) 1244 1975 100.94, 2.65 M.H. Fixed, 95% CI Hetrogeneity: Ch*= 0.28, dr1 (P = 0.59); P = 0% 1.48 (0.94, 2.34] 0.01 0.1 1.0 Total (95% CI) 1244 1975 100.09, 3.67 Hetrogeneity: Ch*= 0.2		MAG		PC			Risk Ratio	Risk Ratio
Beneditio 2016 4 483 155% 300 [04,27], 166 71] Herz 2005 1 113 0 13 155% 300 [01,27,287] Thuijs 2018 2 217 6 948 69.1% 1.46 [0,30,7,17] Total events 7 6 948 69.1% 1.46 [0,30,7,17] Total events 7 6 948 69.1% 1.46 [0,30,7,17] Macrosoften (ChiP = 1.28, df = 2 (P = 0.53); P = 0% 2.86 [0.84,9.78] 0.01 0.1 1.00 MACCCE MAG PCI Risk Ratio Risk Ratio Risk Ratio Study or Subgroup Fewrits Total events 1027 34.4% 1.22 [0.51,2.94] Total events 10 7 10.72 34.4% 1.22 [0.51,2.94] 0.01 0.1 1.00 Forcha 2022 11 10.77 9.1027 34.4% 1.82 [0.94,2.76] M.H.Exed, 95% CI Total events 29 55 1.10 [0.94,2.76] M.H.Exed, 95% CI Modro Favours MAG	Study or Subgroup					Weight		
Her 2005 1 113 15.5% 3.00[01,27,287] Total (95% Ct) 813 15.44 100.0% 2.86 [0.84,9.78] Total (95% Ct) 813 15.44 100.0% 2.86 [0.84,9.78] Total (95% Ct) 813 15.44 100.0% 2.86 [0.84,9.78] Total (95% Ct) 813 15.44 100.0% 2.86 [0.84,9.78] MACCE MAG PCI Risk Ratio Study or Subgroup Events Total Events Total Weight M-H. Eved, 95% CI Total (95% Ct) 1244 1975 100.0% 1.48 [0.94, 2.34] Total (95% Ct) 1244 1975 100.0% 1.48 [0.94, 2.34] Mag relation of the events total Weight M-H. Eved, 95% Ct Major bleeding Mag PCI Risk Ratio Risk Ratio Risk Ratio Study or Subgroup Events Total Zents Total Weight M-H. Eved, 95% Ct Major bleeding Mag PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Zents Total Weight M-H. Eved, 95% Ct Major bleeding Mag PCI Risk Ratio Study or Subgroup Events Total Zents Total Weight M-H. Eved, 95% Ct Major bleeding Mag PCI Risk Ratio Study or Subgroup Events Total Zents Total Weight M-H. Eved, 95% Ct Maghtevitz 2012 3 26 2 271 17.5% 180 [0.90, 1061] Total vents 21 2 3 246 82.5% 3.42 [1.88, 6.22] Total (95% Ct) 43 1219 100.0% 3.14 [1.78, 5.5] Total vents 21 2 5 Total (95% Ct) 413 1219 100.0% 3.14 [1.78, 5.5] Total vents 21 2 5 Total vents 21 1 25 Total vents 21 1 25 Tota								
Thulis 2018 2 217 6 948 69.1% 1.46 [0.30, 7.17] Total (95% Ct) 813 1544 100.0% 2.86 [0.84, 9.78] Total events 7 6 Heterogenety: ChF = 1.28, df = 2 (P = 0.53); J^F = 0% Testfor overall effect Z = 1.68 (P = 0.09) MACCE MAC Parts Total Events Total Zents Total Zents Total Zents Total Events 122 (0.51, 2.94) Total events 20 11 1027 9 1027 34.4% 122 (0.51, 2.94) Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Testfor overall effect Z = 1.67 (P = 0.09) Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.28, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 20 55 Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 21 3 22 6 2 2 7 1 7.5% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 21 3 22 6 2 2 7 1 7.5% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 21 3 22 6 2 2 7 1 7.5% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 21 3 22 6 2 2 7 1 7.5% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 21 3 22 6 2 2 7 1 7.5% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Total events 21 3 20 6 2 2 7 1 7.5% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0% Heterogenety: ChF = 0.45, df = 1 (P = 0.59); J^F = 0%								
Total (95% CI) 813 1544 100.0% 2.86 [0.84,9.78] Total (95% CI) 7 6 Heterogenety: Cht#= 1.28, df = 2 (# = 0.53); I# = 0% 0.1 0.1 1.0 100 MACCE MAG PCI Risk Ratio Risk Ratio Risk Ratio Study or Subgroup Events Total Weight M-H, Eixed, 95% CI M-H, Eixed, 95% CI M-H, Eixed, 95% CI Total (95% CI) 11027 9 1027 34.4% 1.22 (051, 2.94) 100 100 Total (95% CI) 1244 1975 100.0% 1.48 [0.94, 2.34] 100 100 100 Heterogenety: Cht#= 0.28, df = 1 (P = 0.59); I* = 0% 55 1.48 [0.94, 2.34] 100 100 100 100 Major bleeding MG PCI Risk Ratio Risk Ratio Risk Ratio Risk Ratio 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 10								
Total events 7 6 Total events 7 6 Test for overall effect Z= 1.68 (P = 0.53), P = 0% Test for overall effect Z= 1.68 (P = 0.53), P = 0% MACCE MAG PCI Risk Ratio Study of Subgroup Events Total Events Total Weight M-H, Eixed, 95% CI Total events 1027 34.4% 1.22 (0.51, 2.94) Total events 1027 34.4% 1.22 (0.51, 2.94) Total events 28 Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 1.67 (P = 0.59), P = 0% Test for overall effect Z= 0.67 (P = 0.59), P = 0% Test for overall effect Z= 0.67 (P = 0.09) Test for overall eff	Thuis 2016	2	217	0	940	09.1%	1.40 [0.50, 7.17]	
Heterogeneity: ChF = 128, dF = 2 (P = 0.53); F = 0% Test for overall effect: Z = 1.68 (P = 0.09) MACCE MAG PCI Risk Ratio Total constraints 20 Heterogeneity: ChF = 0.28, dF = 1 (P = 0.59); F = 0% Total effect: Z = 1.67 (P = 0.09) MAG PCI Risk Ratio Total effect: Z = 1.67 (P = 0.09) MAG PCI Risk Ratio Risk	Total (95% CI)		813		1544	100.0%	2.86 [0.84, 9.78]	-
Test for overall effect: Z = 1.68 (P = 0.09) UII UII UII UII UII UII MACCE MAG PCI Risk Ratio Risk Ratio Risk Ratio Study or Subgroup Events Total Events 1027 34.4% 1.22 (051, 2.94) Total (95% CI) 1244 1975 100.0% 1.48 [0.94, 2.34] Heterogeneity: Ch ² = 0.28, df = 1 (P = 0.59); P = 0% 55 Test for overall effect Z = 1.67 (P = 0.09) PCI Risk Ratio Major bleeding MAG PCI Risk Ratio Major bleeding MAG PCI Risk Ratio Major bleeding PCI 1.48 [0.94, 2.34] 10 Major bleeding MAG PCI Risk Ratio Major bleeding PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Weight MH, Eixed, 95% CI MH, Eixed, 95% CI Moshtowitz 2012 2 2 271 17.5% 180 [0.30, 1067] 10 Total (95% CI) 443 1219 100.0% 3.14 [1.78, 5.53] Total (95% CI) 443 1219 100.0% 1.01 10 Total (95% CI) 443 1219 100.0% 1.01 10 Total (95% CI) 44	Total events	7		6				0 13 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Testion overall effect. 2 = 1.08 (P = 0.09) Favours MAG Favours PCI MACCE MAG PCI Risk Ratio	Heterogeneity: Chi ² =	1.28, df=	2 (P =	0.53); I*:	= 0%			
MACCE MAG PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Weight M-H, Fixed, 95% CI M-H, Fixed, 95% CI Rocha 2022 11 1027 9 1027 34.4% 1.22 [0.51, 2.94] Thuis 2018 17 217 45 948 65.5% 1.61 [0.94, 2.76] Total solvents 2.0 2.55 5 1.61 [0.94, 2.76] 1.001 Total solvents 2.0 55 5 1.61 [0.94, 2.76] 1.001 Major bleeding 2.28 55 5 1.60 [0.91, 100] 1.00 Major bleeding Events Total Weight M-H, Fixed, 95% CI 1.001 1.00 Study or Subgroup Events Total Weight M-H, Fixed, 95% CI M-H, Fixed, 95% CI 1.001 1.00 Major bleeding 2.26 2.21 1.75% 1.801 [0.30, 10.67] 1.001 1.001 1.00 Total events 2.1 2.5% 3.42 [1.88, 6.22] 1.75% 1.218 1.218	Test for overall effect:	Z=1.68 (P = 0.0	9)				
Image PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Verial M4 Fisk Ratio M4	MACCE							
Study or subgroup Events Total Weinth M.H., Fixed, 95% CI Rocha 2022 111 1027 91 122 122 152 152 152 155 110 100 <td>MACCE</td> <td></td> <td></td> <td>DC</td> <td></td> <td></td> <td>Diel: Datie</td> <td>Diels Datia</td>	MACCE			DC			Diel: Datie	Diels Datia
Rocha 2022 11 1027 9 1027 34.4% 1.22 (0.51, 2.94) Thuijs 2018 17 217 46 948 65.6% 1.61 (0.94, 2.76) Total events 1244 597 100.0% 1.48 (0.94, 2.76) Total events 0.28, df=1 (P = 0.59), f= 0% 0.01 0.1 10 For total events Study or Subgroup Pevents Total Events Total (95% CI) MAG PCI Risk Ratio Study or Subgroup Pevents Total Events Total (95% CI) MAG PCI Risk Ratio MAG PCI Bitw colspan="3">Study or Subgroup Pevents Total Events Total (95% CI) MAG PCI Risk Ratio MAG Pevents Total Events PCI Total (95% CI) MAG Pevents PCI Tot	Churks or Cultureum					Mainlet		
Thulis 2018 17 217 46 948 65.6% 1.61 (0.94, 2.76) Total (95% Ct) 1244 1975 100.0% 1.48 (0.94, 2.76) Heterogeneity: Ch [#] = 0.28, df = 1 (<i>P</i> = 0.59), l [#] = 0% Test for overall effect Z = 1.67 (<i>P</i> = 0.09) Major Dieceding Major Dieceding Major Dieceding 206 2 271 17.5% 1.000,030, 10671 Thulis 2018 18 217 23 948 82.5% 3.42 (1.88, 6.22) Total (95% Ct) 443 1219 100.0% 3.14 [1.78, 5.53] Heterogeneity: Ch [#] = 0.45, df = 1 (<i>P</i> = 0.50), l [#] = 0% 1.00 (3.01, 0.1) Total events 21 2 2.6 2 2.71 17.5% 1.000,030, 10671 Thulis 2018 18 217 2.3 948 82.5% 3.42 (1.88, 6.22) Total (95% Ct) 443 1219 100.0% 3.14 [1.78, 5.53] Heterogeneity: Ch [#] = 0.45, df = 1 (<i>P</i> = 0.50), l [#] = 0% 1.00 (3.01, 0.1) 1 10								M-H, FIXed, 95% CI
Major bleeding MAG Points Other State Other Other State Other Stat								
Total events 28 55 Heterogeneity: Ch ² = 0.26, df = 1 (P = 0.59); P = 0% Total events Total Verial MAG PCI Risk Ratio Study or Subgroup Events Total Verial M. H. Fixed, 95% CI Moshkovitz 2018 18 217 23 948 82.5% 3.42 [1.88, 6.22] Total events 21 25 Total events 21 25 Heterogeneity: Ch ² = 0.001, P = 0% Total events 21 (P = 0.50); P = 0% Heterogeneity: Ch ² = 0.001, P = 0% 0.01 0.1 1 10 100 100 100 100 100 100 10	Thuijs 2018	17	217	46	948	65.6%	1.61 [0.94, 2.76]	
Meterogenetity: Chil ² = 0.59; l ² = 0% 0.01 0.1 100 Major bleeding Major bleeding Study or Subgroup Peerits Total Verints Total Verints Misk Ratio Risk Ratio Risk Ratio Major bleeding Major Diedeing Total Vering 2: 2 2 2 Total events 2 2 Total events			1244		1975	100.0%	1.48 [0.94, 2.34]	◆
Unit of the second seco	Total events	28		55				
Unit of the second seco	Heterogeneity: Chi ² =	0.28, df=	1 (P =	0.59); I*:	= 0%			
Magor bleeding PCI Risk Ratio Risk Ratio Study or Subgroup Events Total Events Total POI Risk Ratio Moshkovitz 2018 3 226 2 271 17.5% 100 [0.90, 10.67] Thulis 2018 18 217 23 948 82.5% 3.42 [1.88, 6.22] Total 695% CI 44.3 1219 100.0% 3.14 [1.78, 5.53]								
MAG PCI Filsk Ratio Risk Ratio Study or Subgroup Events Total Weight M-H, Fixed, 95% CI Moshkovitz 2012 3 226 2 271 17.5% 180 [0.30, 10.67] Thuis 2018 18 217 23 948 82.5% 3.42 [1.88, 6.22] Total (95% CI) 44.3 1219 100.0% 3.14 [1.78, 5.53] Total events 21 25 25 0.01 0.1 100	Major bleedin	a						
Study or Subgroup Feed 5% CI M.H.Fixed, 5% CI Moshkowitz 2012 3 22.6 2.2.7 17.5% 1800 (0.30) (0.67) Thuijs 2018 18 21.7 23 94.8 92.5% 3.42 [1.98, 6.22] Total (95% CI) 44.3 1219 100.0% 3.14 [1.76, 5.53] Image: Children 1.7 Total events 21 25 0.001 0.1 1 100	wajor biecum			PC			Risk Ratio	Risk Ratio
Moshkowitz 2012 3 226 2 271 17.5% 180 [0.30, 10.67] Thuig 2018 18 217 23 948 82.5% 3.42 [1.88, 6.22] Total (95% CI) 443 1219 100.0% 3.14 [1.78, 5.53] Total events 21 25 0.01 0.1 1 10	Study or Subaroup					Weight		
Thuijs 2018 18 217 23 948 82.5% 3.42 [1.86, 6.22] Total (95% C) 443 1219 100.0% 3.14 [1.78, 5.53] Total events 21 25 125 4 Test for small effort 7 > 2.9 (5.4 g/m = 1 (9 = 0.50)) != 0% 0.01 0.1 1 10								
Total events 21 25 Heterogeneity: Chi ² = 0.45, df = 1 (P = 0.50); P = 0% Destfor event) effect 7 = 0.36 (P = 0.0001) 0.01 0.1 1 10 100								
Total events 21 25 Heterogeneity: Chi ² = 0.45, df = 1 (P = 0.50); P = 0% Dest for coveral effect 7 = 0.56 (P = 0.0001) 0.01 0.1 1 10 100	Total (05% CI)		442		1210	100.0%	2 44 14 70 5 5 21	
Heterogeneity: Chi ² = 0.45, df = 1 (P = 0.50); I ² = 0% 0.01 0.1 1 10 100		-	443		1219	100.0%	5.14 [1.78, 5.53]	-
Test for overall effect 7 = 2.05 /P = 0.0001) U.U1 U.1 1 10 100								
					= 0%			0.01 0.1 1 10 100
	Test for overall effect:	Z = 3.95 (P < 0.0	0001)				Favours MAG Favours PCI

Figure 2: MAG vs. DES-PCI with short-term follow up

Forest plot for short-term incidence of MACCE, all cause death, stroke, MI, repeat revascularization and major bleeding. Risk ratio for individual studies (squares) and meta-analysis (diamonds) and 95% CI (horizontal lines) are presented.

Author	Bianco Rocha			Davi	Davierwala Nambiar				Raja		
		Acronym				SYNTAX Extended					
Date	Date 2023 2022			2	021	20	19	2018			
Follow-up	5 y	vears	5 y	5 years		11.9 years		3years		years	
	PCI(n=838)	MAG(n=838)	PCI(n=1027)	MAG(n=1027)	PCI(n=901)	MAG(n=310)	PCI(n=903)	MAG(n=940)	PCI(n=1126)	MAG(n=1030)	
Age (years)			59.8(7.4)	59.5(7.4)	65.3(9.6)	62.4(9.9)	65.2(9.7)	61.7(8.9)	55	62	
Male sex (%)	77.8	83.1	84.8	85.4	76.5	85.2	76.4	64.9	77.6	87.7	
CAD risk factors											
Diabetes (%)	44.2	41.6	42.9	42.6	25.7	23.2	25.6	89.2	21.3	18.1	
Hypertension (%)	86.9	87.1	70.6	69.3	69.4	63.2	68.9	61.2	53.2	78.1	
Dyslipidaemia (%)	86.8	89.3	40.5	40.2	78.3	78.6	78.7	46.8			

Supplementary Table 1:	The characteristics o	of the study included
------------------------	-----------------------	-----------------------

Current smokers (%)	25.4	24.5	19.5	19.6	18.3	24.4	18.5	16.7	19.1	12
Preoperative risk factors										
Previous MI (%)			12.7	12.6	32	29.2	31.9	56	35.4	43.5
Previous cerebrovascular disease	16	16.9	2.4	2.3	13.4	16.8	8.2	2.4	1.8	3.5
Peripheral vascular disease (%)	17.5	19.1			9	9.7			1.5	7.8
COPD (%)	15.8	15.5	12.5	12.9	8.1	6.8		13		
Congestive heart failure (%)	11.6	8.7	6.4	5.6	3.9	2.6	4			
Clinical presentation										
Stable angina (%)	45.1	51.3			57	51.6	56.9		45.7	65.9
Disease type										
3-vessel disease (%)	73.3	80	41.9	40.5	59	64.5				
LMCAD (%)			2.6	2.4	41	35.5				
Author	Tł	nuijs	Ben	edetto	Locker		Ha	bib	Mos	hkovitz
Acronym					E	XCEL				
Date	2	018	2	016	2016		2015		2012	
Follow-up	Зу	rears	3.1	years	7.9 years		9years		5years	
	PCI(n=948)	MAG(n=217)	PCI(n=483)	MAG(n=483)	PCI(n=872)	MAG(n=872)	PCI(n=546)	MAG(n=546)	PCI(n=271)	MAG(n=226)
Age (years)	66.0(9.6)	64.5(9.3)	66(12)	65(9)	66.8(11.6)	62.4(9.9)	60.1(12.8)	60.7(8.1)		
Male sex (%)	76.2	85.7	75.6	79.9	26.4	85.2	77.3	75.6	73.4	85.8
CAD risk factors										
Diabetes (%)	30.2	33	19	16.8	32.6	34.9	38.5	37	100	100
Hypertension (%)	74.5	67.3	68.7	69.6	80.7	83	59.5	9.5	68.6	78.3
Dyslipidaemia (%)	71.5	67.7							75.6	70.4
Current smokers (%)	24.1	62	20.7	18.2						
Preoperative risk factors										
Previous MI (%)	18.1	11.5	33.5	32.5	27.3	27.1	34.6	33.7	21.8	33.6
Previous cerebrovascular disease (%)	5.5	4.6	2.9	2.3	8.4	8.2				
Peripheral vascular disease (%)	10.3		11.2	9.1	12.5	12			5.2	11.9
COPD (%)	6.9	6			10.8	10.5	6	8.4	3.7	3.5
Congestive heart failure (%)	7.1	5.1	26.5	25.7	9.7	9.9	5.5	5.5	9.6	12.4
Clinical presentation										
Stable angina (%)	53.1									
Disease type										

3-vessel disease (%)			24.6	24.6	57.8	61.2	83.3	84.1	57.6	21.2	
LMCAD (%)	100	100	15.1	17.2	5.6	6.5	29.3	8.2	4.1	27	
Author			Herz	1	Herz			Locker			
Acronym											
Date			2006			2005		2004			
Follow-up			lyear			3years		6.5years			
		PCI(n=87)		MAG(n=87)	PCI(n=113)		MAG(n=113)	PCI(n=363)		MAG(n=439)	
Age (ye	ears)				60.0(10)		60.1(10)				
Male sex	к (%)	93	.1	93.1	ç	95.6	95.6	7	3	71	
CAD risk	factors										
Diabetes	s (%)	44.8			3	6.3	32.7	100		100	
Hypertens	ion (%)	64.4			61.1		59.3	49		57	
Dyslipidae	mia (%)	70.1			72.6		70.8				
Current smo	okers (%)										
Preoperative r	risk factors										
Previous N	MI (%)	32	.2		3	8.9	35.4	3	7	39	
Previous cereb disease											
Peripheral vasc (%)		5.7				8.3	6.7	1	0	9.8	
COPD	(%)	4.	6			4.4	2.7		3	8.4	
Congestive hear	rt failure (%)	6.	9			6.2	6.2				
Clinical pres	sentation										
Stable ang	ina (%)										
Disease	type										
3-vessel dis	ease (%)	51	.7	51.7		54	54	27		87	
LMCAD	D (%)	3.	5	29.1		3.5	26.5	3	.3	28	

CAD=coronary artery disease; COPD=chronic obstructive pulmonary diseases; LMCD=left main coronary artery disease: MAG=multiple arterial bypass graft surgery; MI=myocardial infarction; PCI=percutaneous coronary intervention.

For the long-term clinical outcomes, the cumulative incidence of all cause death was 7.09% in the MAG group and 17.6% in the PCI group with significant difference (RR 0.40; 95%CI: 0.30-0.53; p<0.00001; I²=84%). MAG also have significant benefit in cardiovascular death (RR 0.22; 95%CI: 0.06-0.80; p=0.02; I²=0%), non- cardiovascular death (RR 0.16; 95%CI: 0.03-0.88; p=0.04; I²=0%), myocardial infarction (RR 0.29; 95%CI: 0.14-0.60; p=0.0008; I^2 =83%), repeat revascularization (RR 0.17; 95%CI: 0.11-0.27; p<0.00001; I^2 =91%) and MACCE (RR 0.42; 95%-CI: 0.38-0.47; p<0.00001; I^2 =47%). MAG might decrease the incidence of stroke (RR 0.39; 95%CI: 0.10-1.58; p=0.19; I^2 =77%) with no significant difference (Figure3).

	h MAG	5	PCI			Risk Ratio	Risk Ratio
Study or Subgroup	Events				Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Bianco 2023	108	838	213	838	12.0%	0.51 [0.41, 0.63]	-
Davierwala 2021	70	310	305	901	11.9%	0.67 [0.53, 0.84]	
Habib 2015 Herz 2005	24	546 113	75	546 113	9.8% 0.9%	0.32 [0.21, 0.50] 0.14 [0.01, 2.73]	·
Herz 2006	0	87	2	87	0.8%	0.20 [0.01, 4.11]	•
Locker 2004	41	439	47	363	10.3%	0.72 [0.49, 1.07]	
_ocker 2016	129	955	506	1686	12.2%	0.45 [0.38, 0.54]	-
Moshkovitz 2012	21	226	44	271	9.3%	0.57 [0.35, 0.93]	
Nambiar 2019 Raia 2018	9 36	940 1030	125 237	903 1878	7.5%	0.07 [0.04, 0.14] 0.28 [0.20, 0.39]	
Rocha 2022	36	1027	237	1027	10.8%	0.61 [0.41, 0.92]	
Thuijs 2018	3	217	71	948	4.2%	0.18 [0.06, 0.58]	
Total (95% CI)		6728		9561	100.0%	0.40 [0.30, 0.53]	•
Total events Heterogeneity: Tau² =	477	2- 66	1687 96 df = 1	1 / 0 ~ 1	000013	12-0406	
Test for overall effect:				10 -1	5.00001),	1 - 04.0	0.01 0.1 1 10 10
							Favours MAG Favours PCI
Cardiovasular	death		PCI			Dials Datia	Diele Detie
Study or Subgroup	Events	Total	Events	Total	Weight	Risk Ratio M-H, Fixed, 95% Cl	Risk Ratio M-H, Fixed, 95% Cl
Herz 2005	0	113	2	113	14.7%	0.20 [0.01, 4.12] +	<u> </u>
Thuijs 2018	2	217	39	948	85.3%	0.22 [0.05, 0.92]	
T-4-1/05% CD		220		4004	100.04	0.0010.00.0.001	
Total (95% CI) Total events	2	330	41	1061	100.0%	0.22 [0.06, 0.80]	
Heterogeneity: Chi² =	∠ 0.00. df=	1 (P =		- 0%		H	
Test for overall effect:				10.00		0.	.01 0.1 1 10 100 Favours MAG Favours PCI
T		1					
Ion-cardiovas	Cular (h PCI			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	Risk Ratio M-H, Fixed, 95% Cl	Risk Ratio M-H, Fixed, 95% Cl
Herz 2005	0	113	1	113	11.2%	0.33 [0.01, 8.10]	
Thuijs 2018	1	217	32	948	88.8%	0.14 [0.02, 0.99]	
Total (OEV CP		220		1001	100.0%	0.16 [0.03, 0.88]	
Total (95% CI) Total events	1	330	33	1061	100.0%	0.16 [0.03, 0.88]	
Heterogeneity: Chi ² =		1 (P =		: 0%		⊢	
Test for overall effect:				0.0		0.	01 0.1 1 10 100
							Favours MAG Favours PCI
/11							
	MAG		PCI			Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	Weight	M-H, Random, 95% Cl	M-H, Random, 95% Cl
Bianco 2023 Herz 2005	59 1	838 113	141	838 113	21.2% 6.4%	0.42 [0.31, 0.56] 0.50 [0.05, 5.44]	
Herz 2005 Herz 2006	1	87	1	87	5.2%	1.00 [0.06, 15.73]	
Locker 2004	4	439	13	363	14.4%	0.25 [0.08, 0.77]	
Nambiar 2019							
	3	940	87	903	14.1%	0.03 [0.01, 0.10]	
Rocha 2022	14	1027	66	1027	14.1% 19.3%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38]	
					14.1%	0.03 [0.01, 0.10]	
Rocha 2022 Thuijs 2018	14	1027	66	1027 948	14.1% 19.3% 19.4%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48]	
Rocha 2022 Thuijs 2018 Total (95% CI) Total events	14 14 96	1027 217 3661	66 72 382	1027 948 4279	14.1% 19.3% 19.4% 100.0 %	0.03 (0.01, 0.10) 0.21 (0.12, 0.38) 0.85 (0.49, 1.48) 0.29 (0.14, 0.60)	
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau [#] =	14 14 96 0.62; Chi	1027 217 3661 * = 34.	66 72 382 48, df= 6	1027 948 4279	14.1% 19.3% 19.4% 100.0 %	0.03 (0.01, 0.10) 0.21 (0.12, 0.38) 0.85 (0.49, 1.48) 0.29 (0.14, 0.60)	
Rocha 2022 Thuijs 2018 Total (95% CI) Total events	14 14 96 0.62; Chi	1027 217 3661 * = 34.	66 72 382 48, df= 6	1027 948 4279	14.1% 19.3% 19.4% 100.0 %	0.03 (0.01, 0.10) 0.21 (0.12, 0.38) 0.85 (0.49, 1.48) 0.29 (0.14, 0.60)	0.01 0.1 10 10 Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau [#] =	14 14 96 0.62; Chi Z = 3.37 (1027 217 3661 P = 34. (P = 0.0	66 72 382 48, df= 6	1027 948 4279	14.1% 19.3% 19.4% 100.0 %	0.03 (0.01, 0.10) 0.21 (0.12, 0.38) 0.85 (0.49, 1.48) 0.29 (0.14, 0.60)	
Rocha 2022 Thuijs 2018 Total events Heterogeneity: Tau ^s = Test for overall effect: Cepeat revascu	14 14 96 0.62; Chi Z = 3.37 (1027 217 3661 (P = 0.0	66 72 382 48, df= 6	1027 948 4279 (P < 0.	14.1% 19.3% 19.4% 100.0% 00001); F	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83%	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau ^a = Test for overall effect: Cepeat revascu Study or Subgroup	14 14 96 0.62; Chi Z = 3.37 (Ilation MAC Events	1027 217 3661 (P = 0.0 (C = 0.0)	66 72 382 48, df = 6 0008) PCI Events	1027 948 4279 (P < 0. <u>Total</u>	14.1% 19.3% 19.4% 100.0% 00001); F	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI	Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneily: Tau [#] = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023	14 14 96 0.62; Chi Z = 3.37 (Ilation MAC Events 84	1027 217 3661 (P = 0.0 (C = 0.0) Total 838	66 72 382 48, df = 6 0008) PCI Events 317	1027 948 4279 (P < 0. <u>Total</u> 838	14.1% 19.3% 19.4% 00001); F <u>Weight</u> 13.5%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.05 [0.43, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau [#] = Test for overall effect: Cepeat revascu Study or Subgroup Bianco 2023 Habib 2015	14 96 0.62; Chi Z = 3.37 (1lation Events 84 49	1027 217 3661 # = 34. (P = 0.0 5 Total 838 546	66 72 382 48, df = 6 0008) PCI Events 317 274	1027 948 4279 (P < 0. <u>Total</u> 838 546	14.1% 19.3% 19.4% 100.0% 00001); F <u>Weight</u> 13.5% 13.3%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneily: Tau [#] = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023	14 14 96 0.62; Chi Z = 3.37 (Ilation MAC Events 84	1027 217 3661 (P = 0.0 (C = 0.0) Total 838	66 72 382 48, df = 6 0008) PCI Events 317	1027 948 4279 (P < 0. <u>Total</u> 838	14.1% 19.3% 19.4% 00001); F <u>Weight</u> 13.5%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.05 [0.43, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau ² = Test for overail effect Cepeat revascu Study or Subgroup Blanco 2023 Habib 2015 Herz 2005 Herz 2005 Herz 2005	14 14 14 26 (0.62; Chil Z = 3.37 (11 ation MAC Events 84 49 6 5 12	1027 217 3661 [#] = 34. (P = 0.0 Total 838 546 113 87 439	66 72 382 48, df = 6 0008) PCI Events 317 274 16 10 200	1027 948 4279 (P < 0. <u>Total</u> 838 546 113 87 363	14.1% 19.3% 19.4% 100.0% 00001); F <u>Weight</u> 13.5% 13.3% 9.3% 8.5% 11.7%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.14, 0.24] 0.38 [0.15, 0.92] 0.56 [0.18, 1.40]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% C1) Total events Heterogeneity: Tau ^s = Test for overall effect: Copeat revascu Study or Subgroup Bianco 2023 Heirz 2005 Heirz 2005 Locker 2004 Moshkovitz 2012	14 14 14 0.62; Chi Z = 3.37 (11ation Events 84 49 6 5 12 32	1027 217 3661 P = 34. (P = 0.0 Total 838 546 113 87 439 226	66 72 382 48, df = 6 0008) PCI <u>Events</u> 317 274 16 10 200 91	1027 948 4279 (P < 0. Total 838 546 113 87 363 271	14.1% 19.3% 19.4% 000001); F <u>Weight</u> 13.5% 13.3% 9.3% 8.5% 11.7% 12.9%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.14, 0.24] 0.38 [0.14, 0.24] 0.50 [0.18, 1.40] 0.65 [0.03, 0.09] 0.42 [0.29, 0.61]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneily: Tau [#] = Test for overail effect Copeat revascu Study or Subgroup Blanco 2023 Habib 2015 Herz 2005 Lecker 2004 Moshkovitz 2019	14 14 14 2 = 3.37 (11ation MAC Events 84 49 6 5 12 32 2 10	1027 217 36661 * = 34. (P = 0.0 5 Total 838 546 113 87 439 226 940	66 72 382 48, df = 6 0008) PCI <u>Events</u> 317 274 16 10 200 91 233	1027 948 4279 (P < 0. <u>Total</u> 838 546 113 853 863 271 903	14.1% 19.3% 19.4% 100.0% 000001); F 13.5% 13.3% 8.5% 11.7% 12.9%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.18, 1.40] 0.38 [0.30, 0.09] 0.42 [0.29, 0.61] 0.42 [0.2, 0.08]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau ^s = Test for overall effect: CCCPCat revascu Study or Subgroup Bianco 2023 Hetrz 2005 Hetrz 2005 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022	14 14 26 0.62; Chi 2 3.37 (11ation Events 84 49 6 5 12 32 10 45	1027 217 3661 * = 34. (P = 0.0 5 Total 838 546 113 87 439 226 940 1027	66 72 382 48, df = 6 0008) PCI Events 317 274 16 10 200 91 203 257	1027 948 4279 (P < 0. Total 838 546 113 87 363 271 903 1027	14.1% 19.3% 19.4% 100.0% 00001); F <u>Weight</u> 13.5% 13.3% 9.3% 8.5% 11.7% 12.9% 11.2%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.18, 1.40] 0.05 [0.03, 0.04] 0.05 [0.03, 0.04] 0.42 [0.22, 0.61] 0.42 [0.22, 0.61] 0.41 [0.22, 0.61] 0.41 [0.22, 0.61]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneily: Tau [#] = Test for overail effect Copeat revascu Study or Subgroup Blanco 2023 Habib 2015 Herz 2005 Lecker 2004 Moshkovitz 2019	14 14 14 2 = 3.37 (11ation MAC Events 84 49 6 5 12 32 2 10	1027 217 36661 * = 34. (P = 0.0 5 Total 838 546 113 87 439 226 940	66 72 382 48, df = 6 0008) PCI <u>Events</u> 317 274 16 10 200 91 233	1027 948 4279 (P < 0. <u>Total</u> 838 546 113 853 863 271 903	14.1% 19.3% 19.4% 100.0% 000001); F 13.5% 13.3% 8.5% 11.7% 12.9%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.18, 1.40] 0.38 [0.30, 0.09] 0.42 [0.29, 0.61] 0.42 [0.2, 0.08]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau*= Test for overail effect Copeat revascu Study or Subgroup Bianco 2023 Habib 2015 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI)	14 96 : 0.62; Children (Z = 3.37 (Ilation MAC Events 84 49 6 5 12 32 32 32 32 32 32 32 32 32 32 32 32 32	1027 217 3661 * = 34. (P = 0.0 5 Total 838 546 113 87 439 226 940 1027	66 72 382 48, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114	1027 948 4279 (P < 0. 838 546 113 87 363 271 903 1027 948	14.1% 19.3% 19.4% 100.0% 00001); F <u>Weight</u> 13.5% 13.3% 9.3% 8.5% 11.7% 12.9% 11.2%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.18, 1.40] 0.05 [0.03, 0.04] 0.05 [0.03, 0.04] 0.42 [0.22, 0.61] 0.42 [0.22, 0.61] 0.41 [0.22, 0.61] 0.41 [0.22, 0.61]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total vents Heterogeneity: Tau [≠] = Test for overall effect: Copeat revascu Study or Subgroup Bianco 2023 Hetz 2005 Hetz 2005 Hetz 2005 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI)	14 14 96 0.62; Chi Z = 3.37 (11 11 11 11 11 11 11 11 11 11 11 11 11	1027 217 3661 F = 34. (P = 0.0 5 Total 838 546 113 87 439 226 940 1027 217 4433	66 72 382 48, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114 1512	1027 948 4279 (P < 0. Total 838 546 113 87 363 271 903 1027 948 5096	14.1% 19.3% 19.4% 100.0% 00001); F Weight 13.5% 13.3% 8.5% 11.7% 12.9% 11.2% 11.2% 13.2% 6.4% 100.0%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.48 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.13, 1.40] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.04 [0.02, 0.31] 0.18 [0.13, 0.24] 0.08 [0.02, 0.31] 0.17 [0.11, 0.27]	Favours MAG Favours PCI Risk Ratio
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭= Test for overail effect Copeat revascu Study or Suberoup Bianco 2023 Habib 2015 Herz 2006 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭=	14 96 0.62; Chi Z = 3.37 (ilation MAC Events 84 49 6 5 12 32 10 0 45 2 2 10 0 45 2 5 0.43; Chi	1027 217 3661 [#] =34. (P=0.0 ⁵ Total 838 546 113 87 87 439 226 940 1027 217 4433 [#] =86.	66 72 382 49, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114 1512 06, df = 8	1027 948 4279 (P < 0. Total 838 546 113 87 363 271 903 1027 948 5096	14.1% 19.3% 19.4% 100.0% 00001); F Weight 13.5% 13.3% 8.5% 11.7% 12.9% 11.2% 11.2% 13.2% 6.4% 100.0%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.48 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.13, 1.40] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.04 [0.02, 0.31] 0.18 [0.13, 0.24] 0.08 [0.02, 0.31] 0.17 [0.11, 0.27]	Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total vents Heterogeneity: Tau [≠] = Test for overall effect: Copeat revascu Study or Subgroup Bianco 2023 Hetz 2005 Hetz 2005 Hetz 2005 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI)	14 96 0.62; Chi Z = 3.37 (ilation MAC Events 84 49 6 5 12 32 10 0 45 2 2 10 0 45 2 5 0.43; Chi	1027 217 3661 [#] =34. (P=0.0 ⁵ Total 838 546 113 87 87 439 226 940 1027 217 4433 [#] =86.	66 72 382 49, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114 1512 06, df = 8	1027 948 4279 (P < 0. Total 838 546 113 87 363 271 903 1027 948 5096	14.1% 19.3% 19.4% 100.0% 00001); F Weight 13.5% 13.3% 8.5% 11.7% 12.9% 11.2% 11.2% 13.2% 6.4% 100.0%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.48 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.13, 1.40] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.04 [0.02, 0.31] 0.18 [0.13, 0.24] 0.08 [0.02, 0.31] 0.17 [0.11, 0.27]	Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭= Test for overail effect Copeat revascu Study or Suberoup Bianco 2023 Habib 2015 Herz 2006 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭=	14 96 0.62; Chi Z = 3.37 (ilation MAC Events 84 49 6 5 12 32 10 0 45 2 2 10 0 45 2 5 0.43; Chi	1027 217 3661 [#] =34. (P=0.0 ⁵ Total 838 546 113 87 87 439 226 940 1027 217 4433 [#] =86.	66 72 382 49, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114 1512 06, df = 8	1027 948 4279 (P < 0. Total 838 546 113 87 363 271 903 1027 948 5096	14.1% 19.3% 19.4% 100.0% 00001); F Weight 13.5% 13.3% 8.5% 11.7% 12.9% 11.2% 11.2% 13.2% 6.4% 100.0%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.48 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.13, 1.40] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.04 [0.02, 0.31] 0.18 [0.13, 0.24] 0.08 [0.02, 0.31] 0.17 [0.11, 0.27]	Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau ^s = Test for overail effect Copeat revascu Study of Subgroup Bianco 2023 Herz 2005 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau ^s = Test for overail effect.	14 96 0.62; Chi Z = 3.37 (ilation MAC Events 84 49 6 5 12 32 10 0 45 2 2 10 0 45 2 5 0.43; Chi	1027 217 3661 P = 34. (P = 0.0 Total 838 546 113 87 439 2266 940 1027 217 4433 P = 86. (P < 0.0	66 72 382 49, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114 1512 06, df = 8	1027 948 4279 (P < 0. 103 271 363 271 363 271 913 903 948 5096 (P < 0.	14.1% 19.3% 19.4% 100.0% 00001); F Weight 13.5% 13.3% 8.5% 11.7% 12.9% 11.2% 11.2% 13.2% 6.4% 100.0%	0.03 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.21, 0.33] 0.48 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.13, 1.40] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.04 [0.02, 0.31] 0.18 [0.13, 0.24] 0.08 [0.02, 0.31] 0.17 [0.11, 0.27]	Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau*= Test for overail effect Copeat revascu Study or Subgroup Habib 2015 Herz 2005 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Total events Heterogeneity: Tau*= Test for overail effect MACCE Study or Subgroup	14 96 0.02; Chi Z = 3; 37 (ilation MAC Events 84 49 6 5 12 32 10 45 5 2 245 5 0.43; Chi Z = 7.24 (MAC Events	1027 217 3661 F = 34, (P = 0.0 5 Total 838 546 6 113 87 226 940 1027 217 4433 F = 86, (P < 0.0 5 Total	66 72 382 48, df = 6 0008) PCI Events 317 274 16 10 200 91 233 257 114 1512 06, df = 8 00001) PCI Events	1027 948 4279 (P < 0. 7043 838 546 113 87 363 271 903 1027 948 5096 (P < 0. 7048	14.1% 19.3% 19.3% 000001); F <u>Weightt</u> 13.5% 13.5% 13.3% 8.5% 11.7% 12.9% 6.4% 100.0% 000001); F	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.13, 0.24] 0.05 [0.02, 0.03] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.47 [0.11, 0.27] *= 91%	Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% C1) Total events Heterogeneily: Tau [#] = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023 Herz 2006 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% C1) Total events Heterogeneily: Tau [#] = Test for overall effect: MACCE Study or Subgroup	14 96 0.62; Ching Z = 3.37 (11ation MAC Events 84 49 9 6 5 12 32 10 45 2 2 2 2 45 2 245 : 0.43; Ching Z = 7.24 (MAC	1027 217 3661 ₽ = 34. (P = 0.0 1027 217 4433 878 439 940 1027 217 4433 87 44433 ₽ = 86. (P < 0.0 5 Total 838	66 72 382 48, df = 6 0008) PCI Events 317 274 16 10 200 91 114 1512 006, df = 8 00001) PCI Events 499	1027 948 4279 (P < 0. 103 838 8546 113 87 363 271 903 271 903 1027 948 5096 (P < 0. 1027 948 5096 (P < 0. 2017 1027 948	14.1% 19.3% 19.3% 19.4% 100.0% 00001); F <u>Weight</u> 13.5% 13.3% 13.3% 13.3% 13.3% 13.2% 6.4% 100.0% 00001); F	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.14, 0.24] 0.38 [0.15, 0.92] 0.50 [0.13, 1.40] 0.48 [0.14, 0.24] 0.50 [0.13, 0.44] 0.48 [0.14, 0.24] 0.48 [0.13, 0.24] 0.48 [0.13, 0.24] 0.48 [0.13, 0.24] 0.48 [0.02, 0.31] 0.17 [0.11, 0.27] *= 91% Risk Ratio M.H. Fixed, 95% CI 0.46 [0.41, 0.52]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overail effect Study or Suberoup Bianco 2023 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Mambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overail effect MACCE Study or Subgroup Bianco 2023 Herz 2005	14 14 16 10.62; Chi Z = 3.37 (11ation MAC Events 84 49 6 5 12 32 10 45 2 245 : 0.43; Chi Z = 7.24 (MAC Events 245 : 0.43; Chi 22 10 11 11 11 11 11 11 11 11 11	1027 217 3661 [#] = 34. (P = 0.0 1027 105 1027 217 4433 87 940 1027 217 4433 [#] = 86. (P < 0.0 1027 217 1027 217 1027 1027 1027 1027 10	66 72 382 382 48, df=6 0008) PCI Events 317 17 17 200 200 91 233 257 114 1512 06, df=8 00001) PCI Events 499 95	1027 948 4279 (P < 0. Total 838 546 113 7 363 271 948 5096 (P < 0. Total 838 113	14.1% 19.3% 19.3% 19.3% 000001); F <u>Weinhtt</u> 13.5% 13.3% 8.5% 8.5% 6.4% 10.0% 11.7% 6.4% 10.00% 11.7% 6.4%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.13, 0.24] 0.05 [0.02, 0.03] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.45 [0.41, 0.27] *= 91%	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% C1) Total events Heterogeneihy: Tau [#] = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023 Herz 2005 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% C1) Total events Heterogeneihy: Tau [#] = Test for overall effect: MACCE Study or Subgroup Bianco 2023 Herz 2005 Moshkovitz 2012	14 96 0.62; Chi Z = 3.37 (11ation MAC Events 84 49 6 5 12 2 32 100 45 2 245 0.43; Chi Z = 7.24 (Events 2 245 2.255 2.245 2.245 2.255 2.245 2.2	1027 217 3661 F = 34. (P = 0.0 5 Total 838 546 113 87 226 940 920 1027 217 4433 F = 86. (P < 0.0 5 Total 838 813 3226	666 72 382 48, df=6 00008) PCI Events 317 274 16 10 274 16 10 200 91 1233 257 114 1512 200 91 1512 26, df=8 00001) PCI 1512 26 91 1512 26 91 1512 27 11 11 20 11 11 11 20 11 11 11 11 11 11 11 11 11 11 11 11 11	1027 948 4279 (P < 0. 838 546 113 87 948 5096 (P < 0. 10 27 948 5096 (P < 0. 10 27 948 5096 (P < 0. 10 27 948 5096 (P < 0. 10 27 948 50 5 10 27 10 27 10101010101010101010	14.1% 19.3% 19.3% 19.3% 100.0% 000001); F Weidht 13.5% 9.3% 9.3% 9.3% 9.3% 9.3% 9.3% 9.3% 9.3	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random. 95% CI 0.26 [0.13, 0.44] 0.38 [0.15, 0.22] 0.50 [0.13, 1.40] 0.48 [0.14, 0.24] 0.50 [0.13, 0.44] 0.48 [0.14, 0.24] 0.48 [0.14, 0.24] 0.48 [0.14, 0.24] 0.48 [0.13, 0.24] 0.48 [0.13, 0.24] 0.48 [0.13, 0.24] 0.18 [0.13, 0.24] 0.48 [0.15, 0.55% CI 0.40 [0.13, 0.56]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overail effect Study or Suberoup Bianco 2023 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Mambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overail effect MACCE Study or Subgroup Bianco 2023 Herz 2005	14 14 16 10.62; Chi Z = 3.37 (11ation MAC Events 84 49 6 5 12 32 10 45 2 245 : 0.43; Chi Z = 7.24 (MAC Events 245 : 0.43; Chi 22 10 11 11 11 11 11 11 11 11 11	1027 217 3661 [#] = 34. (P = 0.0 1027 105 1027 217 4433 87 940 1027 217 4433 [#] = 86. (P < 0.0 1027 217 1027 217 1027 1027 1027 1027 10	66 72 382 382 48, df=6 10008) PCI Events 317 17 17 17 200 200 91 233 257 114 1512 206, df=8 00001) PCI Events 499 95	1027 948 4279 (P < 0. Total 838 546 113 7 363 271 948 5096 (P < 0. Total 838 113	14.1% 19.3% 19.3% 19.3% 000001); F <u>Weinhtt</u> 13.5% 13.3% 8.5% 8.5% 6.4% 10.0% 11.7% 6.4% 10.00% 11.7% 6.4%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.15, 0.92] 0.50 [0.18, 1.40] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.47 [0.11, 0.27] *= 91% Risk Ratio M-H, Fixed, 95% CI 0.46 [0.41, 0.52] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.3, 0.42]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overail effect Copeat revascu Study or Suberoup Bianco 2023 Herz 2005 Herz 2006 Locker 2004 Locker 2004 Locker 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overail effect MACCE Study or Subgroup Bianco 2023 Herz 2005 Moshkoviz 2012 Rocha 2022 Thuijs 2018	14 96 0.62; Chi32 4 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 3661 ₽ = 34. (P = 0.0 3 7 101 206 5 439 226 6 940 1027 217 4433 ₽ = 86. (P < 0.0 5 7 101 838 838 113 226 6 1027 217	666 72 382 48, df = 6 00008) PCI Events 317 274 10 00009 91 233 274 10 200 91 233 237 274 114 1512 206, df = 8 00001) PCI Events 99 5 1255 295 295 295	1027 948 4279 (P < 0. Total 838 546 113 271 903 1027 948 5096 (P < 0. Total 838 113 271 1027 948	14.1% 19.3% 19.3% 19.3% 10000% 000001); i 13.3% 9.3% 9.3% 9.3% 9.3% 13.2% 6.4% 10000% 000001); i 000001); i 000001); i	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.15, 0.92] 0.50 [0.18, 1.40] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.13, 0.24] 0.48 [0.13, 0.24] 0.48 [0.13, 0.24] 0.41 [0.11, 0.52] *= 91 % Risk Ratio M-H, Fixed, 95% CI 0.46 [0.41, 0.52] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.31, 0.58]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneihy: Tau* = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023 Herz 2006 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% CI) Total events Heterogeneihy: Tau* = Test for overall effect: MACCE Study or Subgroup Bianco 2023 Herz 2005 Moshkovitz 2012 Rocha 2022 Rocha 202 Rocha 2022 Rocha 2022 Roc	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 3661 F = 34. (P = 0.0 5 5 6 5 6 6 7 7 8 3 8 7 8 3 8 7 8 3 8 7 8 3 8 7 8 3 8 7 8 3 8 7 8 3 8 7 8 3 8 3	66 72 382 48, df = 6 90008) 90008) 90008) 317 274 1512 206, df = 8 90001) 91 1512 206, df = 8 90001) 91 154 206, df = 8 91 233 257 114 156 206, df = 6 91 233 257 114 156 206 125 206 125 205 125 205 125 205 125 205 125 205 125 205 125 205 125 205 125 205 205 205 205 205 205 205 205 205 2	1027 948 4279 (P < 0. Total 838 546 113 271 903 1027 948 5096 (P < 0. Total 838 113 271 1027 948	14.1% 19.3% 19.3% 19.3% 000001); i 000001); i 13.5% 9.3% 9.3% 9.3% 9.3% 9.3% 9.3% 9.3% 9.3	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.15, 0.92] 0.50 [0.18, 1.40] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.47 [0.11, 0.27] *= 91% Risk Ratio M-H, Fixed, 95% CI 0.46 [0.41, 0.52] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.3, 0.42]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau≭ = Test for overall effect Copeat revascu Study or Subgroup Bianco 2023 Herz 2005 Letz 2005 Letz 2005 Locker 2004 Locker 2004 Locker 2019 Rocha 2022 Total 95% CI) Total events Heterogeneity: Tau≭ = Test for overall effect MACCE Study or Subgroup Bianco 2023 Herz 2015 Moshkowitz 2012 Rocha 2022 Thuijs 2018 Total 95% CI) Total events	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 3661 [#] =34.(P=0.(¹ 3 ¹ 5 ¹ 113 838 546 6 546 6 940 940 940 940 940 940 940 940 940 947 1027 217 ² 7 ²	66 72 8922 48, df = 6 90008) PCCL PCOLS 317 274 46 16 10 00 200 91 233 265 717 114 1512 233 265, df = 8 00001) PCCL 200, df = 8 233 255 114 1512 233 265 114 1512 233 255 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 1512 205 114 114 114 114 114 114 114 114 114 11	1027 948 4279 (P < 0. 103 838 546 546 546 5096 (P < 0. 703 948 5096 (P < 0. 7048 838 113 1027 948 5096 (P < 0. 7048 838 113 1027 948 3197	14.1% 19.3% 19.3% 19.3% 10000% 000001); i 13.3% 9.3% 9.3% 9.3% 9.3% 13.2% 6.4% 10000% 000001); i 000001); i 000001); i	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.04, 0.02] 0.45 [0.02, 0.31] 0.17 [0.11, 0.27] 0.46 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.41, 0.55] 0.46 [0.41, 0.55] 0.47 [0.31, 0.86] 0.41 [0.31, 0.55] 0.42 [0.38, 0.47]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneihy: Tau* = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023 Herz 2006 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% CI) Total events Heterogeneihy: Tau* = Test for overall effect: MACCE Study or Subgroup Bianco 2023 Herz 2005 Moshkovitz 2012 Rocha 2022 Rocha 202 Rocha 2022 Rocha 2022 Roc	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 3661 F = 34, (P = 0.0 5 5 5 5 5 6 7 7 8 8 8 8 8 8 8 7 8 9 40 9 9 40 9 40 1027 217 4433 F = 86. (P < 0.0 5 5 6 5 7 6 7 8 3 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8	66 72 382 84, df = 6 0008) 9 PCC Events 317 317 317 317 317 317 317 317 317 317	1027 948 4279 (P < 0. 103 838 546 546 5096 (P < 0. 703 948 5096 (P < 0. 7048 838 113 1027 948 5096 (P < 0. 7048 838 113 1027 948 3197	14.1% 19.3% 19.3% 19.3% 10000% 000001); i 13.3% 9.3% 9.3% 9.3% 9.3% 13.2% 6.4% 10000% 000001); i 000001); i 000001); i	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.04, 0.02] 0.45 [0.02, 0.31] 0.17 [0.11, 0.27] 0.46 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.41, 0.55] 0.46 [0.41, 0.55] 0.47 [0.31, 0.86] 0.41 [0.31, 0.55] 0.42 [0.38, 0.47]	Favours MAG Favours PCI Risk Ratio MH, Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneihy: Tau ^s = Test for overall effect: Repeat revascu Study or Subgroup Bianco 2023 Herz 2005 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% CI) Total events Heterogeneihy: Tau ^s = Test for overall effect: MACCE Study or Subgroup Bianco 2023 Herz 2005 Mosshkovitz 2012 Rocha 2024 Rocha 2025 Herz 2005 Mosshkovitz 2012 Rocha 2025 Herz 2005 Mosshkovitz 2012 Rocha 2025 Herz 2005 Mosshkovitz 2012 Rocha 2025 Herz 2005 Mosshkovitz 2012 Rocha 2025 Rocha 2025 Roch	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 3661 F = 34, (P = 0.0 5 5 5 5 5 6 7 1027 217 4433 F = 86. (P < 0.0 5 7 5 7 7 217 217 217 217 217 217 217 217 217	66 72 382 84, df = 6 0008) 9 PCC Events 317 317 317 317 317 317 317 317 317 317	1027 948 4279 (P < 0. 103 838 546 546 5096 (P < 0. 703 948 5096 (P < 0. 7048 838 113 1027 948 5096 (P < 0. 7048 838 113 1027 948 3197	14.1% 19.3% 19.3% 19.3% 10000% 000001); i 13.3% 9.3% 9.3% 9.3% 9.3% 13.2% 6.4% 10000% 000001); i 000001); i 000001); i	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.04, 0.02] 0.45 [0.02, 0.31] 0.17 [0.11, 0.27] 0.46 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.41, 0.55] 0.46 [0.41, 0.55] 0.47 [0.31, 0.86] 0.41 [0.31, 0.55] 0.42 [0.38, 0.47]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau* = Test for overall effect: Copeat revascu Study or Subgroup Blanco 2023 Hetr 2005 Herz 2005 Locker 2004 Moshkovitz 2012 Nambiar 2019 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau* = Test for overall effect: Diato 2023 Herz 2005 Moshkovitz 2012 Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Chi* = Total events Heterogeneity: Chi* = Total events	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 3661 F = 34, (P = 0.0 5 5 5 5 5 6 7 1027 217 4433 F = 86. (P < 0.0 5 7 5 7 7 217 217 217 217 217 217 217 217 217	66 72 382 84, df = 6 0008) 9 PCC Events 317 317 317 317 317 317 317 317 317 317	1027 948 4279 (P < 0. 103 838 546 546 5096 (P < 0. 703 948 5096 (P < 0. 7048 838 113 1027 948 5096 (P < 0. 7048 838 113 1027 948 3197	14.1% 19.3% 19.3% 19.3% 10000% 000001); i 13.3% 9.3% 9.3% 9.3% 9.3% 13.2% 6.4% 10000% 000001); i 000001); i 000001); i	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.36 [0.14, 0.24] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.21, 0.55] 0.46 [0.21, 0.55] 0.46 [0.21, 0.55] 0.46 [0.21, 0.55] 0.46 [0.31, 0.55] 0.41 [0.3, 0.48] 0.42 [0.28, 0.47] 0.42 [0.38, 0.47]	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI 0.01 0.1 0.1 10 100 Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau* = Test for overall effect: Competition overall effect:	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 37661 F=34. (P=0.0 1027 217 4433 F=86. (P<0.0 1027 217 4433 226 940 1027 217 2421 4 (P=0.0 1027 217 2421 4 (P=0.0 5 1027 217 2421 5 1027 2421 5 1027 1	666 72 382 84, df = 6 0008) PCCI Events 317 17 17 17 17 17 17 17 17 17 17 17 17 1	1027 948 4279 (P < 0. 70tal 838 546 113 87 948 5096 (P < 0. 705 948 5096 (P < 0. 705 838 113 271 948 5096 (P < 0. 705 838 113 271 948 5096 (P < 0. 705 1007 948 505 505 (P < 0. 705 1007 948 505 505 (P < 0. 705 1007 948 505 505 505 505 505 505 505 505 505 50	14.1% 19.3% 19.3% 19.3% 19.3% 100.0% Weidht 13.5% 13.3% 8.5% 6.4% 13.2% 6.4% 13.2% 6.4% 13.2% 6.4% 13.2% 6.4% 100.0%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.21, 0.33] 0.48 [0.14, 0.24] 0.05 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.13, 0.24] 0.46 [0.41, 0.52] *= 91% Risk Ratio M-H, Fixed, 95% CI 0.46 [0.41, 0.52] 0.42 [0.38, 0.42] 0.54 [0.33, 0.88] 0.42 [0.38, 0.42] 0.54 [0.33, 0.88]	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% C1) Total events Heterogeneily: Tau≭= Test for overall effect: Repeat revascu Study or Subgroup Herz 2005 Herz 2005 Herz 2005 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% C1) Total events Heterogeneily: Tau≭= Test for overall effect: MACCE Study or Subgroup Total (95% C1) Total events Heterogeneily: Chi≭= Total (95% C1) Total events Heterogeneily: Chi≭= Total fevents Heterogeneily: Chi≭= Total fevents Heterogeneily: Chi≭= Test for overall effect: troke Study or Subgroup	14 14 14 14 14 14 14 14 14 14	1027 217 33661 = 34.4 = 34.4 	66 72 3822 84, df = 6 30008) PCC Pvents 317 317 317 317 317 317 317 317 317 317	1027 948 4279 (P < 0. 70tal 838 546 113 87 948 5096 (P < 0. 70tal 838 5102 (P < 0. 70tal 838 8113 271 948 5096 (P < 0. 70tal 838 53 71 948 53 71 948 53 71 948 54 71 948 71 948 71 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 948 70 70 948 70 70 948 70 70 948 70 70 948 70 70 70 948 70 70 70 70 70 70 70 70 70 70 70 70 70	14.1% 19.3% 19.3% 19.3% 10.0% 10.3% 10.0% 11.3% 13.3% 13.3% 13.5% 13.3% 13.5% 13.3% 13.5% 13.5% 13.5% 13.5% 13.5% 13.5% 0.0% 0.0% 11.7% 0.0001); F	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.18, 1.40] 0.36 [0.18, 0.42] 0.42 [0.22, 0.33] 0.42 [0.22, 0.63] 0.42 [0.22, 0.63] 0.44 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.41, 0.52] 0.46 [0.41, 0.55] 0.41 [0.31, 0.56] 0.41 [0.31, 0.56] 0.41 [0.33, 0.88] 0.41 [0.33, 0.88] 0.42 [0.38, 0.47] Risk Ratio M.H. Random, 95% CI	Favours MAG Favours PCI Risk Ratio M.H. Random, 95% CI 0.01 0.1 0.1 10 100 Favours MAG Favours PCI
Rocha 2022 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau [≠] = Test for overall effect: 2005 Hetr 2005 Herz 2005 Herz 2005 Herz 2005 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% CI) Total events Heterogeneity: Tau [≠] = Test for overall effect: 2005 Moshkovitz 2012 Bianco 2023 Herz 2005 Moshkovitz 2012 Total 205% CI) Total events Heterogeneity: Tau [≠] = Total events Heterogeneity: CI) [∓] Total events Heterogeneity: CI) [≠] Total events Heterogeneity: CI) [†] Total events Heterogeneity: CI) [†] Total events Heterogeneity: CI) [†] Heterogeneity: C	14 14 14 14 14 14 14 14 14 14 14 14 14 1	1027 217 217 217 3661 P = 34. P = 0.0 838 546 546 546 546 546 1027 217 4433 P = 86. (P < 0.0 5 1027 217 217 217 217 217 217 217 2	666 72 382 84, df = 6 9008) PCC Events 317 17 17 17 17 17 17 10 10 00 91 200 91 205 17 11 4 1512 205, df = 8 00001) PCC PCOLS 205 205 205 205 205 205 205 205 205 205	1027 948 4279 (P < 0. Total 838 546 516 5096 (P < 0. 7027 948 113 1027 948 5096 (P < 0. 7028 5096 (P < 0. 7028 3197 3197 948 3197 838	14.1% 19.3% 19.3% 19.3% 100.0% Weidht Weidht Weidht 11.2% 5.3% 100.0% Weidht 35.2%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.21, 0.33] 0.48 [0.14, 0.24] 0.36 [0.22, 0.31] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.41, 0.52] *= 91 % Risk Ratio M.H. Fixed, 95% CI 0.34 [0.28, 0.42] 0.54 [0.33, 0.88] 0.42 [0.38, 0.42] 0.54 [0.33, 0.88] 0.42 [0.38, 0.47] .5% [C] .11,4 [0.74, 1.75]	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% C1) Total events - eleterogeneily: Tau [≠] = Test for overall effect: 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	14 14 14 14 14 14 14 14 14 14	1027 217 33661 ^µ = 34. ^µ = 34. ^µ = 6.0. ⁵ 546 113 838 546 546 113 226 940 1027 217 4433 226 (P < 0.0 ¹ 546 1027 217 217 217 217 217 217 217 217 217 2	866 72 3822 84, df = 6 30008) PCC Pvents 317 317 317 317 317 317 317 317 317 317	1027 948 4279 (P < 0. 70tal 838 546 113 71 903 271 903 271 948 5096 (P < 0. 7048 838 546 113 271 948 5096 (P < 0. 7048 838 546 546 112 71 948 838 546 546 112 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 546 71 948 546 71 948 546 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 71 948 546 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 71 71 948 71 71 71 948 71 71 71 71 948 71 71 71 948 71 71 71 948 71 71 71 948 71 71 71 71 948 71 71 71 948 71 71 71 948 71 71 71 71 948 71 71 71 948 71 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 71 948 71 71 71 71 71 71 71 71 71 71 71 71 71	14.1% 19.3% 19.3% 19.3% 10.0% 10.0% 11.3% 13.5% 13.3% 8.5% 8.5% 13.3% 8.5% 13.3% 8.5% 13.3% 8.5% 13.2% 10.00% Weight 13.2%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.14, 0.24] 0.38 [0.14, 0.24] 0.38 [0.14, 0.24] 0.42 [0.02, 0.03] 0.42 [0.02, 0.03] 0.44 [0.41, 0.52] 0.44 [0.31, 0.56] 0.34 [0.28], 0.42] 0.54 [0.33, 0.89] 0.42 [0.38, 0.47] Risk Ratio M.H. Randorn, 95% CI 1.14 [0.74, 1.76] 0.33 [0.18, 10] 0.13 [0.18, 10] 1.44 [0.74, 1.76] 0.33 [0.18, 10] 0.43 [0.18, 10] 0.43 [0.01, 8.10] 0.43 [0.01, 8.10] 0.44 [0.01, 8.10] 0.44 [0.01, 8.10] 0.45 [0.01, 8.10] 0	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total vents Heterogeneity: Tau* = Test for overall effect: 2005 Herz 2005 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total (95% CI) Total effect: Past for overall effect: Past CCE Study or Subgroup Bianco 2023 Heterogeneity: Tau* = Total (95% CI) Total effect: Diale vents Heterogeneity: CI)* Total effect: Total effect: Total effect: Heterogeneity: CI)* Total effect: Heterogeneity: CI)* Heterogeneity: CI	14 14 14 14 14 14 14 14 14 14	1027 217 33661 P=34. P=0.0 S38 546 546 546 940 940 940 940 1027 217 4433 87 8838 113 87 2266 940 1027 217 217 243 226 1027 217 217 217 2421 2421 2421 2421 2421	666 72 382 84, df = 6 9008) PCCI Events 317 174 161 0200 91 233 257 114 1512 265, df = 8 90001) PCCI Events 1061 0.011); F= PCCI Events 1061 0.011); F= PCCI Events 1061 0.011); F= PCCI 1061 0.001) PCCI Events 1061 0.011); F= PCCI 1061 0.011); F= PCCI 1061 0.011]; F= PCCI 1061]; F= PCCI 1061]; F= PCCI 1061]; F= PCCI 1061];	1027 948 4279 (P < 0. Total 838 546 516 5096 (P < 0. 7048 113 1027 948 5096 (P < 0. 7048 113 1027 948 511 703 271 7048 3197 3497 3497 3497 3497 3497 3497 3497 34	14.1% 19.3% 19.3% 19.3% 100.0% 000001); I Weight 13.5% 13.5% 13.5% 13.5% 13.5% 13.5% 100.0% 000001); I Weight 11.2% 5.3% 100.0% 000001); I Weight 11.2% 5.3% 100.0% 000001); I 11.2% 12.2% 12.2% 12.2% 12.2% 11.2% 12.2% 11.2% 11.2% 11.2% 12.2% 12.2% 12.2% 11.2% 11.2% 12.5% 12.5%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.21, 0.33] 0.48 [0.14, 0.24] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.41, 0.52] *= 91 % Risk Ratio M.H. Fixed, 95% CI 1.14 [0.74, 1.76] 0.33 [0.01, 8.10] 0.49 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 0.42 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 0.42 [0.2, 0.39] 0.42 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 0.40 [0.2, 0.39] 0.40 [0.2, 0.39] 0.40 [0.2, 0.39] 1.44 [0.74, 1.76] 0.49 [0.2, 0.39] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 0.49 [0.2, 0.39] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 0.49 [0.2, 0.39] 1.44 [0.74, 1.76] 1.44 [0.74, 1	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total vents Heterogeneity: Tau* = Test for overall effect: Acceptat revascu Study or Subgroup Bianco 2023 Herz 2005 Herz 2005 Herz 2006 Locker 2004 Moshkovitz 2012 Thuijs 2018 Total 95% CI) Total eyents Heterogeneity: Tau* = Test for overall effect: Bianco 2023 Herz 2005 Herz 2005 Herz 2005 Study or Subgroup Eteros Study or Subgroup Eteros Study or Subgroup Eteros 2023 Herz 2005 Nambiar 2019 Total eyents Heterogeneity: Chi* = Test for overall effect: troke Study or Subgroup Bianco 2023 Herz 2005 Nambiar 2019 Thuijs 2018	14 14 14 14 14 14 14 14 14 14	1027 217 33661 ^µ = 34. ^µ = 34. ^µ = 6.0. ⁵ 546 113 838 546 546 113 226 940 1027 217 4433 226 (P < 0.0 ¹ 546 1027 217 217 217 217 217 217 217 217 217 2	866 72 3822 84, df = 6 30008) PCC Pvents 317 317 317 317 317 317 317 317 317 317	1027 948 4279 (P < 0. 70tal 838 546 113 71 903 271 903 271 948 5096 (P < 0. 7048 838 546 113 271 948 5096 (P < 0. 7048 838 546 546 112 71 948 838 546 546 112 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 546 71 948 546 71 948 546 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 546 71 948 71 948 546 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 948 71 71 71 948 71 71 71 948 71 71 71 71 948 71 71 71 948 71 71 71 948 71 71 71 948 71 71 71 71 948 71 71 71 948 71 71 71 948 71 71 71 71 948 71 71 71 948 71 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 948 71 71 71 948 71 71 71 71 71 71 71 71 71 71 71 71 71	14.1% 19.3% 19.3% 19.3% 10.0% 10.0% 11.3% 13.5% 13.3% 8.5% 8.5% 13.3% 8.5% 13.3% 8.5% 13.3% 8.5% 13.2% 10.00% Weight 13.2%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.29 [0.14, 0.60] *= 83% Risk Ratio M.H. Randorn, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.38 [0.14, 0.24] 0.38 [0.14, 0.24] 0.38 [0.14, 0.24] 0.42 [0.02, 0.03] 0.42 [0.02, 0.03] 0.44 [0.41, 0.52] 0.44 [0.31, 0.56] 0.34 [0.28], 0.42] 0.54 [0.33, 0.89] 0.42 [0.38, 0.47] Risk Ratio M.H. Randorn, 95% CI 1.14 [0.74, 1.76] 0.33 [0.18, 10] 0.13 [0.18, 10] 1.44 [0.74, 1.76] 0.33 [0.18, 10] 0.43 [0.18, 10] 0.43 [0.01, 8.10] 0.43 [0.01, 8.10] 0.44 [0.01, 8.10] 0.44 [0.01, 8.10] 0.45 [0.01, 8.10] 0	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI
Rocha 2022 Thuijs 2018 Total (95% CI) Total vents - elerogeneily: Tau [≠] = Test for overall effect: 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	14 14 14 14 14 14 14 14 14 14	1027 217 33661 P=34. P=0.0 S38 546 546 546 940 940 940 940 1027 217 4433 87 8838 113 87 2266 940 1027 217 217 243 226 1027 217 217 217 2421 2421 2421 2421 2421	66 72 382 84, 64 = 6 30008) 317 317 317 317 317 257 114 1512 66, 67 = 8 300001) 91 233 257 114 1512 66, 67 = 8 325 125 295 137 1061 137 10001) 90001) 90001 90000 90001 900000 900000 9000000	1027 948 4279 (P < 0. 838 546 546 546 546 546 546 546 546 546 546	14.1% 19.3% 19.3% 19.3% 100.0% 000001); I Weight 13.5% 13.5% 13.5% 13.5% 13.5% 13.5% 100.0% 000001); I Weight 11.2% 5.3% 100.0% 000001); I Weight 11.2% 5.3% 100.0% 000001); I 11.2% 12.2% 12.2% 12.2% 12.2% 11.2% 12.2% 11.2% 11.2% 11.2% 12.2% 12.2% 12.2% 11.2% 11.2% 12.5% 12.5%	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M.H. Random, 95% CI 0.26 [0.21, 0.33] 0.18 [0.14, 0.24] 0.36 [0.21, 0.33] 0.48 [0.14, 0.24] 0.05 [0.03, 0.09] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.02, 0.08] 0.42 [0.29, 0.61] 0.44 [0.41, 0.52] *= 91 % Risk Ratio M.H. Fixed, 95% CI 1.14 [0.74, 1.76] 0.33 [0.01, 8.10] 0.49 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 0.42 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 0.42 [0.2, 0.39] 0.42 [0.2, 0.39] 1.14 [0.74, 1.76] 0.39 [0.2, 0.39] 0.40 [0.2, 0.39] 0.40 [0.2, 0.39] 0.40 [0.2, 0.39] 1.44 [0.74, 1.76] 0.49 [0.2, 0.39] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 0.49 [0.2, 0.39] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 1.44 [0.74, 1.76] 0.49 [0.2, 0.39] 1.44 [0.74, 1.76] 1.44 [0.74, 1	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI
Rocha 2022 huijs 2013 huijs 2014 foral (5% CI) foral events feterogeneity: Tau*= fetrogeneity: Tau*= fetrogeneity: Cause alanco 2023 tablo 2015 fetr 2006 excker 2004 ooshkovit 2012 alambia 2018 rotal (9% CI) fotal events feterogeneity: Tau*= set for overall effect Blanco 2023 feterogeneity: Cause set for overall effect set for overall effect telerogeneity: Chi*= set for overall effect telerogeneity: Chi*= set for overall effect telerogeneity: Chi*= set or overall effect telerogeneity: Chi*= set or overalleffect tev	14 14 14 14 14 14 14 14 14 14	1027 217 3661 9 = 34. (P = 0.(3 5 7 total 838 940 940 940 940 940 940 940 940 940 940	666 72 382 84, df = 6 10008) PCCI Events 317 257 114 1512 266, df = 8 00001) PCCI Events 137 1061 0,11); P= 105 137 1061 0,11); P= 25 265 265 265 265 265 265 265 265 265	1027 948 4279 (P < 0. 838 546 546 546 546 546 546 546 546 546 546	14.1% 19.3% 19.3% 19.3% 100.0% Weidht 13.5% 13.5% 13.3% 8.5% 8.5% 13.2% 6.4% 13.2% 6.4% 100.0% Weidht 11.2% 5.3% 100.0% Weidht 11.2% 12.5% 10.5% 1	0.3 [0.01, 0.10] 0.21 [0.12, 0.38] 0.85 [0.49, 1.48] 0.25 [0.14, 0.60] *= 83% Risk Ratio M-H, Random, 95% CI 0.26 [0.21, 0.33 0.18 [0.14, 0.24] 0.36 [0.21, 0.33 0.18 [0.14, 0.24] 0.36 [0.22, 0.31] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.42 [0.29, 0.61] 0.44 [0.13, 0.24] 0.46 [0.41, 0.52] *= 91% Risk Ratio M-H, Fixed, 95% CI 0.46 [0.41, 0.52] 0.34 [0.28, 0.42] 0.54 [0.33, 0.88] 0.42 [0.38, 0.47] Cital (0.74, 1.76] 0.33 [0.01, 8, 15] 0.44 [0.10, 1.86] 0.39 [0.10, 1.58]	Favours MAG Favours PCI Risk Ratio M-H. Random, 95% CI

Figure 3: MAG vs. DES-PCI with long-term follow up

Forest plot for long-term incidence of MACCE, all cause death, stroke, MI and repeat revascularization. Risk ratio for individual studies (squares) and meta-analysis (diamonds) and 95% CI (horizontal lines) are presented.

Subgroup analysis for MAG with first-generation DES-PCI was performed. After long-term follow up, MA--CABG was associated with significant lower incidence of MACCE, all cause death and repeat revascularization. MA--CABG might decrease the incidence of stroke without significant difference. Same results were confirmed when comparing MA-CABG with second-generation DES-PCI. Pervious study demonstrated bilateral internal thoracic artery grafting is superior to other forms of multiple arterial grafting in providing survival benefit [26]. We pooled results in trials

using BITA in CABG arm, CABG with BITA also superior

to PCI in MACCE, all cause death, stroke, MI and repeat revascularization (Table1).

	CABG	PCI	RR	95%CI	р	I ² (%)
	L	MA-CABG v	s F-DES	.		-
MACCE	339	384	0.40	0.30-0.54	<0.0001	0
All cause death	2835	2489	0.27	0.11-0.63	0.02	90
MI	1579	1466	0.20	0.04-1.03	0.05	75
Repeat revascularization	1805	1737	0.17	0.05-0.60	0.006	95
		MA-CABG w	rs S-DES			
MACCE	1244	1975	0.41	0.26-0.63	<0.0001	66
All cause death	2274	3101	0.39	0.23-0.68	0.0009	69
MI	1244	1975	0.43	0.11-1.68	0.22	92
Repeat revascularization	1244	1975	0.16	0.12-0.22	<0.0001	28
		BITA-CABC	G vs PCI			
MACCE	556	1332	0.45	0.35-0.57	<0.0001	0
All cause death	2022	2685	0.26	0.09-0.72	0.009	89
Stroke	1270	1964	0.19	0.08-0.47	0.0004	16
MI	1796	2414	0.30	0.06-1.49	0.14	88
Repeat revascularization	2022	2685	0.15	0.05-0.47	0.001	94

Table 1: Subgroup analysis

MA-CABG= multiple arterial coronary artery bypass graft; F-DES=first-generation drug-eluting stent; S-DES=second-generation drug-eluting stent; MACCE=major adverse cardiac and cerebrovascular events; MI= myocardial infarction; BITA= bilateral internal thoracic arterial; PCI= percutaneous coronary intervention.

Bias assessment showed low-to-moderate risk of

bias in all studies. The funnel plot did not show asymmetry consistent with publication bias (Figure 4).

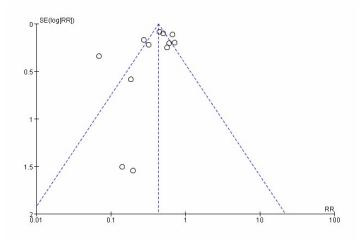


Figure 4: The funnel plot for incidence of all cause death with long-term follow up.

Discussion

Optimal revascularization approaches for patients with multivessel coronary artery disease or left main coronary artery disease remain controversial. Advances in PCI techniques have resulted in improved degree of revascularization and clinical outcomes.

As a less invasive approach, PCI offers quicker recovery, lower incidence of early adverse cardiovascular events and possibly short-term reduced risk of stroke. While higher rate of residual angina was seen in patients treated with PCI that contributes to higher rates of repeat revascularization. The SYNTAX II trial compared patients undergoing PCI with contemporary techniques, shown improved clinical outcomes even compared with the SYNTAX I CABG arm [27]. In a recent pooled analysis of 11 randomized trials comparing CABG with PCI, 5-year all-cause mortality was significantly lower after CABG in patients with diabetes but not in those without diabetes [4]. As the gap in the treatment effect between two strategies has gradually diminished. The less invasive interventional approach has been recognized as a reasonable therapeutic alternative for LMCA disease instead of CABG with the widespread use of drug-eluting stents [28,29]. However, the recommendation of optimal revascularization approaches for patients with LMCAD also were debated.

The pathophysiological effects of CABG were quite different with PCI. The cardioprotective superiority of CABG was postulated to result from bypass grafts to the mid-coronary vessels that not only treat culprit lesion, but also afford prophylaxis against new proximal disease by mitigating the impact of plaque rupture and atherothrombosis on future events. While, CABG is associated with delayed recovery, longer length of stay in hospital and issues with healing and infection, in addition to higher costs. Nevertheless, outcomes following CABG may vary according to the type of grafts used. Pervious retrospective and pooled observational studies have shown lower long-term mortality when both internal-thoracic-artery grafts are used for CABG than single internal-thoracic-artery graft CABG [30-33]. There remains an ambiguity regarding the superiority of multiple arterial grafts compared to single arterial grafts (SAG) in randomized controlled trials. ART trial concluded there was no significant between-group difference in the rate of death from any cause at 10 years in the intention-to-treat analysis [34]. Changal et al also shown similar survival advantage between MAG and SAG, but MAG has better revascularization and stroke outcomes in randomized data [35]. When directly compares short-term/long-term outcomes of PCI vs CABG with MAG, current evidence was limited and conflicting.

In our analysis, we included studies direct compare clinical outcomes of MAG with PCI using DES in MV-CAD/LMCAD. Most of pooled results shown significant benefit in MAG arm with long-term follow up. As previous study demonstrated the use of all-cause mortality reduces the risk of adjudication bias. In our study, MA-CABG significant decrease the incidence of all cause death (RR 0.40; 95%CI: 0.30-0.53; p<0.00001; I^2 =84%), while there was high heterogeneity in the overall pooled result. The high heterogeneity was mostly associated with the study published by Nambiar. The heterogeneity between pooled studies decreased when exclude this study (RR 0.47; 95%CI: 0.38-0.59; p<0.00001; I^2 =69%), without change the result. Nambiar et al retrospective 940 patients underwent multivessel minimally invasive cardiac surgery (MICS) CABG via a left mini-thoracotomy as MA-CABG arm, giving excellent short-term and long-term mortality. When propensity score matched with PCI arm from SYNTAX trial, the mortality of CABG arm was significantly lower than PCI arm (0.9% vs 11.4%). This result might partly because of higher rate of complete revascularization in CABG arm (97% vs 56%). Incomplete revascularization is common after PCI in patients with three-vessel disease and/or left main coronary artery disease, the degree of incompleteness was associated with long-term mortality [36]. Our study also demonstrated superiority of MAG-CABG in patients with three-vessel disease and/or left main coronary artery disease even comparing with second-generation DES. CABG might still the most optimal revascularization approaches for these patients.

Our study has several limitations. First, there was no randomized clinical trials direct compare MAG with DES-PCI, we included observational and observational propensity-score matched studies in this meta-analysis, which was prone to selection bias and confounding. Indeed,

the complexity of equipoise and influence of surgical expertise are herculean challenges for randomized clinical trials [37]. while traditional RCTs have low external validation, high costs, need for numerous staff and heavy documentation leading to low adherence from surgeons [38]. As the observational study represent the everyday practice, our pooled results from these studies might also give a primary conclusion. Second, half of included studies using first-generation DES in PCI arm, which may lead to inferior clinical outcomes. However, in our subgroup analysis, the result from MAG-CABG vs. second-generation DES was consistent with the result from MAG-CABG vs. first-generation DES. Third, most studies compare MAG vs PCI included patients with left main or multivessel coronary artery disease at the same time. In our study, we performed a meta-analysis in study level and included these patient groups together. Recent study demonstrated lesion site (ostial or shaft vs. distal bifurcation) and PCI technique (1-stent vs. 2-stent) mainly affected the efficacy of intervention therapy [39]. LM-CAD might a specify situation when compare surgery and intervention. It is still doubt whether the long-term adverse events following the use of a single stent for distal LMCA lesions can be comparable with CABG. Unfortunately, without data from patient level, we cannot perform a detailed analysis with separated situation (MVCAD/LMCAD). As CABG mainly performed in both patients with left main or

multivessel coronary artery disease in the real-world practice, our analysis given a general conclusion. What is more, our analysis could not control for variations in clinical practice in different study centers, although our funnel plot did not show significant publication bias between included studies, publication bias may still exist despite our best efforts to conduct a comprehensive search.

Conclusion

Our meta-analysis showed that among patients with multivessel coronary artery disease or left main coronary artery disease, multi arterial coronary artery bypass graft was associated with comparable clinical outcomes in short-term, and superior efficacy with long-term follow up compared with PCI. As the existence of a learning curve and perception of increased sternal wound problems were still the concerns over MAG. These findings should be extended to large, multi-site randomized controlled trials.

Funding

None.

Disclosures

The authors have no conflicts of interest to disclose.

References

1. Burack JH (2008) Drug-eluting stents vs. coronary-artery bypass grafting. N Engl J Med 358: 2643.

 Mulukutla SR, Gleason TG, Sharbaugh M et al. (2019) Coronary Bypass Versus Percutaneous Revascularization in Multivessel Coronary Artery Disease. Ann Thorac Surg 108: 474-80.

3. Sipahi I, Akay MH, Dagdelen S, Blitz A, Alhan C (2014) Coronary artery bypass grafting vs percutaneous coronary intervention and long-term mortality and morbidity in multivessel disease: meta-analysis of randomized clinical trials of the arterial grafting and stenting era. JAMA Intern Med 174: 223-30.

4. Head SJ, Milojevic M, Daemen J et al. (2018) Mortality after coronary artery bypass grafting versus percutaneous coronary intervention with stenting for coronary artery disease: a pooled analysis of individual patient data. Lancet 391: 939-48.

5. Windecker S, Kolh P, Alfonso F et al. (2015) 2014 ESC/EACTS guidelines on myocardial revascularization. EuroIntervention 10: 1024-94.

6. Patel MR, Calhoon JH, Dehmer GJ et al. (2017) AC-C/AATS/AHA/ASE/ASNC/SCAI/SCCT/STS 2017 Appropriate Use Criteria for Coronary Revascularization in Patients With Stable Ischemic Heart Disease: A Report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, and Society of Thoracic Surgeons. J Am Coll Cardiol 69: 2212-41.

7. Hu X, Wang Y (2021) Importance of complete revascularization and surgical techniques when comparing outcomes of CABG with PCI. Am Heart J 236: 107-8.

8. Stone GW, Sabik JF, Serruys PW et al. (2016) Everolimus-Eluting Stents or Bypass Surgery for Left Main Coronary Artery Disease. N Engl J Med 375: 2223-35. Harskamp RE, Park DW (2015) Stenting versus surgery for significant left main disease. Curr Cardiol Rep 17: 18.

10. Boden WE, Caterina R, Taggart DP (2021) Is there equivalence between PCI and CABG surgery in long-term survival of patients with diabetes? Importance of interpretation biases and biological plausibility. Eur Heart J.

11. Buxton BF, Shi WY, Tatoulis J, Fuller JA, Rosalion A, Hayward PA (2014) Total arterial revascularization with internal thoracic and radial artery grafts in triple-vessel coronary artery disease is associated with improved survival. J Thorac Cardiovasc Surg 148: 1238-43.

12. Higgins JP, Altman DG, Gotzsche PC et al. (2011) The Cochrane Collaboration's tool for assessing risk of bias in randomised trials. BMJ 343: d5928.

13. Rocha RV, Fang J, Tam DY et al. (2021) Multiple arterial coronary bypass grafting is associated with better survival compared with second-generation drug-eluting stents in patients with stable multivessel coronary artery disease. J Thorac Cardiovasc Surg.

Bianco V, Mulukutla S, Aranda-Michel E et al. (2023)
 Coronary Artery Bypass With Multiarterial Grafting vs Percutaneous Coronary Intervention. Ann Thorac Surg 115: 404-10.

15. Locker C, Mohr R, Lev-Ran O et al. (2004) Comparison of bilateral thoracic artery grafting with percutaneous coronary interventions in diabetic patients. Ann Thorac Surg 78: 471-5.

 Herz I, Moshkovitz Y, Loberman D et al. (2005) Drug-eluting stents versus bilateral internal thoracic grafting for multivessel coronary disease. Ann Thorac Surg 80: 2086-90.

17. Herz I, Moshkovitz Y, Braunstein R, et al. Comparison between multivessel stenting with drug eluting to the LAD and bilateral internal thoracic artery grafting. Heart Surg Forum. 2006;9(1):E522-527.

 Moshkovitz Y, Mohr R, Medalion B et al. (2012)
 Drug-eluting stents compared with bilateral internal thoracic artery grafts for diabetic patients. Ann Thorac Surg 94:

1455-62.

 Habib RH, Dimitrova KR, Badour SA et al. (2015)
 CABG Versus PCI: Greater Benefit in Long-Term Outcomes
 With Multiple Arterial Bypass Grafting. J Am Coll Cardiol 66: 1417-27.

20. Benedetto U, Caputo M, Vohra H, Bryan A, Angelini GD (2016) State of the art in coronary revascularization: Everolimus eluting stents versus multiple arterial grafting. Int J Cardiol 219: 345-9.

21. Locker C, Schaff HV, Daly RC et al. (2016) Multiple arterial grafts improve survival with coronary artery bypass graft surgery versus conventional coronary artery bypass grafting compared with percutaneous coronary interventions. J Thorac Cardiovasc Sur 152: 369-79.

22. Raja SG, Ilsley C, De Robertis F et al. (2018) Mid-to-long term mortality following surgical versus percutaneous coronary revascularization stratified according to stent subtype: An analysis of 6,682 patients with multivessel disease. PLoS One 13: e0191554.

23. Nambiar P, Kumar S, Mittal CM, Sarkar IC (2019) Outcomes of Bilateral Internal Thoracic Arteries in Minimally Invasive Coronary Artery Bypass Grafting With Analogy to the SYNTAX Trial. Innovations (Phila) 14: 227-35.

24. Thuijs D, Head SJ, Stone GW et al. (2019) Outcomes following surgical revascularization with single versus bilateral internal thoracic arterial grafts in patients with left main coronary artery disease undergoing coronary artery bypass grafting: insights from the EXCEL trialdagger. Eur J Cardiothorac Surg 55: 501-10.

25. Davierwala PM, Gao C, Thuijs D et al. (2021) Single or multiple arterial bypass graft surgery vs. percutaneous coronary intervention in patients with three-vessel or left main coronary artery disease. Eur Heart J.

26. Kelly R, Buth KJ, Legare JF (2012) Bilateral internal thoracic artery grafting is superior to other forms of multiple arterial grafting in providing survival benefit after coronary bypass surgery. J Thorac Cardiovasc Surg 144: 1408-15.

27. Takahashi K, Serruys PW, Fuster V et al. (2020) Redevelopment and validation of the SYNTAX score II to individ-

ualise decision making between percutaneous and surgical revascularisation in patients with complex coronary artery disease: secondary analysis of the multicentre randomised controlled SYNTAXES trial with external cohort validation. Lancet 396: 1399-412.

28. Stefanini GG, Holmes DR (2013) Drug-eluting coronary-artery stents. N Engl J Med 368: 254-65.

29. Byrne RA, Joner M, Kastrati A (2015) Stent thrombosis and restenosis: what have we learned and where are we going? The Andreas Gruntzig Lecture ESC 2014. Eur Heart J 36: 3320-31.

30. Taggart DP, D'Amico R, Altman DG (2001) Effect of arterial revascularisation on survival: a systematic review of studies comparing bilateral and single internal mammary arteries. Lancet 358: 870-5.

31. Yi G, Shine B, Rehman SM, Altman DG, Taggart DP (2014) Effect of bilateral internal mammary artery grafts on long-term survival: a meta-analysis approach. Circulation 130: 539-45.

32. Buttar SN, Yan TD, Taggart DP, Tian DH (2017) Long-term and short-term outcomes of using bilateral internal mammary artery grafting versus left internal mammary artery grafting: a meta-analysis. Heart 103: 1419-26.

33. Tam DY, Rocha RV, Fang J et al. (2021) Multiple arterial coronary bypass grafting is associated with greater survival in women. Heart 107: 888-94.

34. Taggart DP, Benedetto U, Gerry S et al. (2019) Bilateral versus Single Internal-Thoracic-Artery Grafts at 10 Years. N Engl J Med 380: 437-446.

35. Changal K, Masroor S, Elzanaty A et al. (2020) Meta-Analysis Comparing Multiple Arterial Grafts Versus Single Arterial Graft for Coronary-Artery Bypass Grafting. Am J Cardiol 130: 46-55.

36. Takahashi K, Serruys PW, Gao C et al. (2021) Ten-Year All-Cause Death According to Completeness of Revascularization in Patients With Three-Vessel Disease or Left Main Coronary Artery Disease: Insights From the SYNTAX Extended Survival Study. Circulation 144: 96-109. 37. Gaudino M, Kappetein AP, Di Franco A et al. (2020) Randomized Trials in Cardiac Surgery: JACC Review Topic of the Week. J Am Coll Cardiol 75: 1593-604.

38. Zolin SJ, Petro CC, Prabhu AS et al. (2020) Registry-Based Randomized Controlled Trials: A New Paradigm for Surgical Research. J Surg Res 255: 428-35.

39. Hyun J, Kim JH, Jeong Y et al. (2020) Long-Term Outcomes After PCI or CABG for Left Main Coronary Artery Disease According to Lesion Location. JACC Cardiovasc Interv 13: 2825-36.

Submit your manuscript to a JScholar journal and benefit from:

- Convenient online submission
- ¶ Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Better discount for your subsequent articles
 Alternation
 Alter

Submit your manuscript at http://www.jscholaronline.org/submit-manuscript.php