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Mid-term and long-term outcomes of endoscopic versus open vein harvesting for coronary artery bypass: A systematic review and meta-analysis

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ABSTRACT

Background: Two prevalent harvesting techniques are routinely utilized in coronary artery bypass grafting (CABG): endoscopic vein harvesting (EVH) and open vein harvesting (OVH). Our purpose is to compare mid-term and long-term outcomes between these two techniques for CABG.
Methods: After the acquisition of evidence, available studies assessing both harvesting techniques with follow-up precondition (a minimum of one year) were identified. The primary outcome was all-cause mortality. Secondary outcomes of interest included the number of intra-operative graft injuries, leg-wound complications, in-hospital mortality, major adverse cardiac events (MACE) and graft patency.
Results: Twenty-two studies including 27911 patients were identified. The incidences of all-cause mortality, in-hospital death, and MACE were similar between EVH and OVH. EVH was associated with more graft injuries (weighted mean difference (WMD) 0.73; 95% confidence interval (CI) 0.18–1.28; P = 0.009), lower mid-term graft patency (odds ratio (OR) 0.80; 95% CI 0.70–0.91; P = 0.0005), and decreased long-term graft patency (OR 0.15, 95% CI 0.04–0.61; P = 0.008) as compared with OVH. Fewer leg-wound complications were observed in endoscopic harvesting as compared to conventional technique (OR 0.19, 95% CI 0.12–0.30; P < 0.001). Data from subgroup analysis suggested study period as a key factor affecting the outcomes for graft patency.
Conclusion: The risks for all-cause mortality, in-hospital death, and MACE are similar between EVH and OVH. EVH increases conduit injuries and lowers mid-long term graft patency rates, however, study period, with growing surgical expertise, may be associated with better outcomes.

1. Introduction

For the management of coronary artery diseases, coronary artery bypass grafting (CABG) remains a routine procedure, in which the saphenous vein is the most commonly used conduit, due to its easy availability and friendly harvesting. The saphenous vein is conventionally harvested via long, straightforward incision along its course to allow for direct visualization [1]. However, open vein harvesting (OVH) is associated with a higher risk for wound complications, including surgical site infection, hematoma, and pain [2]. Endoscopic vein harvesting (EVH), initially introduced in 1996, is a minimal-invasive alternative frequently used worldwide for reducing leg-wound complications [3].

Despite its proven advantages in harvest-site healing [4], mid-term and long-term outcomes of EVH are still unclear, as some studies are not well-powered because of the small patient population and insufficient follow-up (less than 1 year) [5,6]. Some results are even conflicting since non-standardized harvesting technique of EVH leads to varying degrees of intra-operative mechanical injuries [7]. Previous studies had shown that EVH increased mortality significantly as compared with OVH [8], meanwhile, venous conduit patency was reported to be significantly lower with EVH from one year onwards [9,10]. Currently, the quality of conduit is still the focus of controversy between these two harvesting methods [11] and remains the golden

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standard reflecting operators' expertise [12], which is considered as an important factor affecting the outcomes for CABG [7,13].

Focusing on mid-term and long-term outcomes, the purpose of the present study is to assemble the most comprehensive evidence currently available in the literature to address this debatable question: which harvesting technique, EVH or OVH, is more clinically beneficial to patients undergoing CABG?

2. Methods

2.1. Clinical data search strategy

This systematic review with meta-analysis was conducted in line with the Meta-analysis Of Observational Studies in Epidemiology (MOOSE) recommendations and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol [14,15]. We reported our work complying with the Assessing the Methodological Quality of Systematic Reviews (AMSTAR) guidelines. The deadline for literature search was April 1st, 2019, without limitation to article type, region or language of publication. Eligible studies were from on-line databases of Pubmed, Embase, the Cochrane Library, Web of Science, Japanese National Institute of Informatics (CiNii), China National Knowledge Infrastructure (CNKI) and Wanfang Database. Medical Subject Headings (MeSH) terms, as well as their combinations, were searched in "Title/Abstract" via: coronary artery bypass grafting/CABG/coronary artery bypass/coronary artery bypass graft AND saphenous vein/venous conduit/venous graft AND vein harvesting/vein harvest AND endoscopic/minimally invasive, with Related Articles function applied to expand the results. When the same institution published duplicate but similar reports, the most comprehensive study with the longest follow-up period was taken into consideration.

2.2. Study inclusion and exclusion

Inclusion criteria: (I) patients: patients who undergo CABG; (II) intervention: EVH versus OVH, with follow-up period no less than 1 year; (III) study types: all randomized controlled trials (RCTs) and comparative studies available in the literature; (IV) outcomes: studies that quantitatively assessed at least one of the outcomes of interest.

Exclusion criteria: (I) letters to the editor, editorials, review papers, case reports, non-clinical studies, and meta-analysis papers; (II) studies that failed to clearly clarify outcomes of interest.

2.3. Data extraction

Two independent reviewers (GHL and YZ) performed data extraction. Any disagreement was resolved by discussion and consultation with the senior author in this paper (JMZ). The primary outcome of interest was all-cause mortality. While secondary outcomes of interest were the occurrence of in-hospital death, number of intra-operative graft injuries, leg-wound complications, major adverse cardiac events (MACE) and graft patency during follow-up. Mid-term and long-term outcomes referred to results of relevant endpoints after 1–5 years and 5–7 years of follow-up, respectively.

2.4. Quality assessment

Risk of bias assessments of RCT and observational studies were based on the Cochrane Handbook for Systematic Reviews of Interventions [16] and the Newcastle-Ottawa scale (NOS) [17], respectively. RCTs with low risk of bias and observational studies with a quality score over 7 points were considered as "high-quality".

2.5. Statistical analysis

Stata version 14.0 (Stata Corp., College Station, TX, USA) and Review Manager 5.0 (Cochrane Collaboration, Oxford, UK) were used for data analysis. Weighted mean difference (WMD) was used in continuous variables, while the odds ratio (OR) was employed in dichotomous variables. For time-to-event outcomes with long-term follow-up, incidence rate ratios (IRRs) were used and calculated on the logarithmic scale with generic inverse variance. IRR was calculated in one of two ways: (1) using Kaplan-Meier survival curve estimates and the P-value of the log-rank survival curve to reckon standard error of the logarithm-converted IRR or (2) using absolute event number divided by patient-mean follow-up duration, as described previously [18]. The Engauge Digitizer (version 4.1) was applied to extract the data displayed in a Kaplan-Meier survival curve, and an estimated survival rate was constructed according to the methods by Tierney [18], Guyot and colleagues [19]. When confronting uncertainties regarding data extraction, corresponding authors were contacted for further confirmation. 95% confidence interval (CI) was applied to all data using either a fixed or the random-effects model. For quantitative assessment of heterogeneity, the Cochran Q test and I^2 statistic were used. Significant heterogeneity was set as $P < 0.01$ or $I^2 > 50\%$. The random-effects model was employed in case of high heterogeneity, otherwise, the fixed-effects model was indicated [16].

Subgroup analyses were deployed according to age (< 65 years old or 65 years old and beyond), region (Europe, America, and Asia) and the study period (in and before or after 2011). We also carried out sensitivity analysis for high-quality studies. To screen for publication bias, Egger's test with Begg's funnel plot was used [20,21]. A two-tailed P value less than 0.05 was deemed as statistical significance.

3. Results

A total of 2572 potential articles were identified from all databases (Fig. 1). 22 studies including 27911 patients (13357 for EVH, and 14554 for OVH) fulfilled the standard of inclusion and were selected for further analyses.

3.1. Characteristics of included studies

Table 1 displays the characteristics of included studies, of which five [6,8,9,22,23] were RCTs, six [24–29] were prospective non-randomized cohort studies, and the remaining eleven studies [30–40] were retrospective. Of these studies, seven were performed in North America, eight were launched in Europe, and the remaining seven were carried out in Asia. For study period, thirteen studies were relatively old (in and before 2011), while six studies were new studies (after 2011).

Supplemental Figure 1A describes the risk of bias of five RCTs, and except one moderate risk RCT, the other RCTs were considered as low risk. Supplemental Fig. 1B summarizes the risk of bias of included observational studies, among which seven had a quality score lower than seven, and the remaining were studies of high-quality.

3.2. Baseline characteristics and perioperative outcomes

Baseline patient characteristics are shown in Supplemental Table 1. The analysis of preoperative demographics revealed larger patient populations of males, diabetes, and hypertension in the EVH group. When studying the intra-operative characteristics, no between-technique differences were noted with respect to conduit harvesting time, cardiopulmonary bypass time, duration of aortic cross-clamping and the number of grafts. The differences in reoperation rate, post-operative early myocardial infarction, length of hospital stay, visual analog score (VAS) and ASEPSIS score were also insignificant (Table 2).

3.3. Primary outcome

Eleven studies [6,8,9,23,26,28,30–32,34,37] offered information on all-cause mortality. And method of harvesting (EVH or OVH) was not

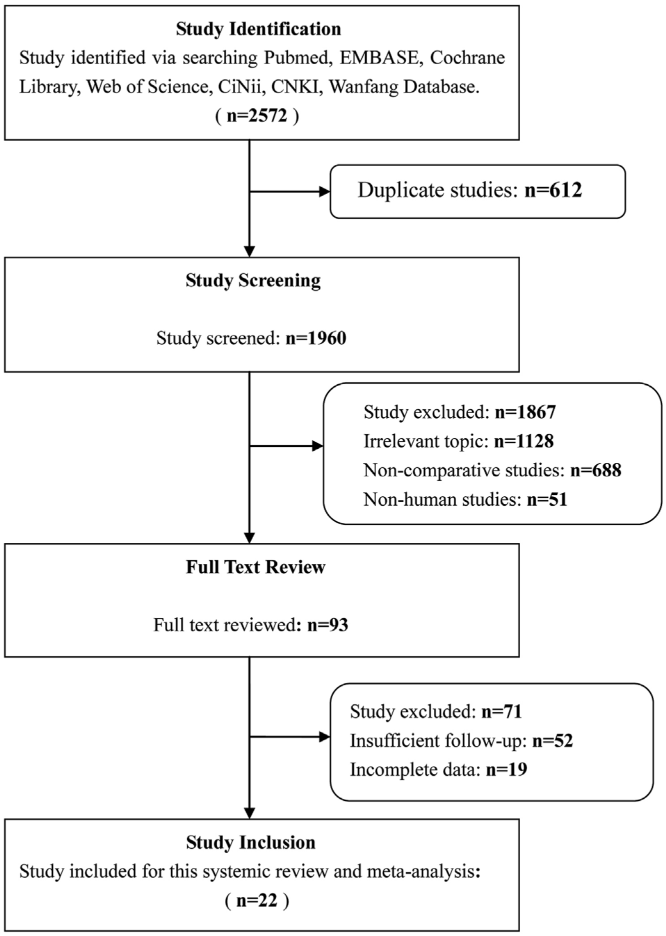

Fig. 1. Flow diagram of evidence acquisition process.

related to a difference at the statistical level pertinent to all-cause mortality (IRR 0.98, 95% CI 0.48–1.99; P = 0.95) (Fig. 2).

3.4. Secondary outcomes

The pooled data from eight studies [9,26,27,29,33,37,38,40] which evaluated in-hospital death in 12736 patients (Table 2) showed that no significant differences were identified between EVH and OVH (1.82% and 2.63%; OR 0.78, 95% CI 0.60–1.01; P = 0.06). However, more graft injuries were observed in the EVH group (WMD 0.73; 95% CI 0.18 to 1.28; P = 0.009) (Supplemental Table 1). The incidence of leg-wound complications was significantly lower in EVH group than that in the OVH group (0.75% versus 2.92%; OR 0.19, 95% CI 0.12–0.30; P < 0.001) (Table 2 and Supplemental Fig. 2).

The rate of MACE was illustrated in thirteen studies [6,8,9,22,23,25,27–29,33,35,37,40], however, significant differences were absent between EVH and OVH (IRR 1.01, 95% CI 0.54–1.90; P = 0.98) (Fig. 3).

Results for the comparison of graft patency are shown in Fig. 4. One-year graft patency assessment was conducted in five studies [9,24,37–39], with patency rates of 81.04% and 86.58% in EVH and OVH group, respectively, and the differences were insignificant (OR 0.80; 95% CI 0.51–1.27; P = 0.34). Data on mid-term (1–5 years) graft patency were obtained in five studies [8,25,36,39,40], showing that patency was markedly lower in EVH group (73.37% versus 77.81%; OR 0.80; 95% CI 0.70–0.91; P = 0.0005). Also, the pooled analysis from two studies [27,30] including 73 patients led to a significant between-technique difference in long-term (5–7 years) patency (OR 0.15, 95% CI 0.04–0.61; P = 0.008).

3.5. Subgroup analysis

Only endpoints reported in at least three studies were eligible for subgroup analyses, which were conducted according to age, region, and study period. Results of subgroup analyses (Supplemental Table 2) demonstrated that age (< 65 years old or ≥65 years old), region (Europe, America, and Asia) and study period (in and before 2011 or after 2011) did not influence the risks for all-cause mortality, in-hospital death, MACE, and 1-year graft patency. In the subgroup analysis for mid-term patency, we failed to see the statistical difference between EVH and OVH when an American RCT in 2009 was excluded

Table 1
Characteristics of included studies.

Studies	Year	Country	EVH(n)	OVH(n)	Study period (years)	Study design	Institutions	Follow-up period
Ad et al.	2011	USA	1734	254	2006–2009	Prospective	Inova Heart and vascular institute	39.6 months
Allen et al.	2003	USA	54	58	1996–1997	Prospective	St. Vincent Hospital and Health Care Center	5 years
Andreasen et al.	2015	Denmark	66	63	2004–2007	Retrospective	Aalborg University Hospital	6.3 years
Bonde et al.	2004	UK	52	56	2000–2001	RCT	Royal Victoria Hospital	3 years
Chou et al.	2009	Taiwan	270	78	2004–2005	Retrospective	National Taiwan University	1 year
Dacey et al.	2010	USA	4480	4062	2001–2004	Retrospective	Dartmouth-Hitchcock Medical Center	4 years
Grant et al.	2012	UK	533	2132	2008–2010	Retrospective	University Hospital of South Manchester	22 months
Kirmani et al.	2010	UK	89	182	N/A	Retrospective	Blackpool Victoria Hospital	17–37 months
Krishnamoorthy et al.	2017	UK	200	100	2011–2015	RCT	University Hospital of South Manchester	2 years
Lopes et al.	2009	USA	1753	1247	2002–2003	RCT	Duke University Medical Center	3 years
Luckraz et al.	2018	UK	50	50	N/A	Prospective	Heart and Lung Center, Wolverhampton	32.5 months
Lutz et al.	2001	Germany	88	85	1997	Retrospective	Albert-Ludwigs-University Freiburg	16 months
Ma et al.	2015	China	210	123	2007–2011	Retrospective	Peking Union Medical College Hospital	3 year
Matsuyama et al.	2018	Japan	149	171	2009–2016	Retrospective	New Tokyo Hospital	5 years
Ouzounian et al.	2010	Canada	2004	3821	1998–2007	Prospective	Dalhousie University	2.6 years
Tao et al.	2014	China	159	191	2012–2013	Prospective	General Hospital of Shenyang Military Region	1 year
Varlamov et al.	2014	Russia	50	50	N/A	Prospective	Kazan State Medical University	31.5 months
Wang et al.	2017	China	81	72	2012–2013	Retrospective	Union Hospital, Tongji Medical College	1 year
Xiao et al.	2013	China	129	139	2005–2010	Retrospective	General Hospital of Beijing Military Region	3 years
Zenati et al.	2011	USA	564	907	2003–2007	RCT	Veterans Affairs Boston Healthcare System	1 year
Zenati et al.	2019	USA	576	574	2014–2017	RCT	Veterans Affairs Boston Healthcare System	2.78 years
Zhang et al.	2016	China	66	139	2012–2013	Retrospective	The First Affiliated Hospital, of Zhengzhou University	2 years

Abbreviations: EVH, endoscopic venous harvesting; OVH, open venous harvesting; RCT, randomized controlled trial; N/A, not available.

Table 2
Perioperative and early outcomes.

Dichotomous variables	EVH, N/n (%)	OVH, N/n (%)	OR	95% CI	P value
Reoperation	246/7730	351/11093	1.15	0.97–1.37	0.11
In-hospital mortality	86/5309	124/6576	0.76	0.57–1.01	0.06
Postoperative early MI	18/2423	44/4070	0.72	0.41–1.25	0.24
Leg complications	73/9698	273/9354	0.19	0.12–0.30	< 0.001
Continuous variables	**EVH, mean/n**	**OVH, mean/n**	**WMD**	**95% CI**	**P value**
Length of hospital stay	7.92/4899	7.96/4311	−0.25	−0.8	0.22
VAS score	2.35/322	4.2/134	−2.04	−6.47	0.22
ASEPSIS score	1.61/322	6.20/134	−4.6	−17.63	0.31

Note & Abbreviations: N, number of patients with associated condition; n, total number of patients; EVH, endoscopic vein harvesting; OVH, open vein harvesting; OR, odds ratio; CI, confidence interval; MI, myocardial infarction; WMD, weighted mean difference; VAS, visual analog scale; ASEPSIS represents Additional treatment, Serous discharge, Erythema, Purulent exudate, Separation of deep tissues, Isolation of bacteria, Stay duration as inpatient; WMD with minus value favors OVH over EVH.

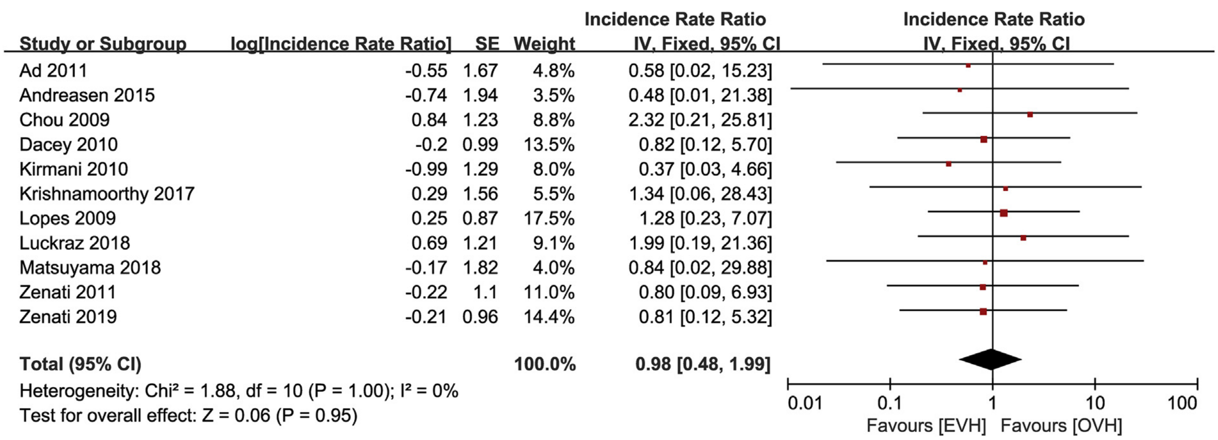

Fig. 2. Forest plot and meta-analysis of all-cause mortality.
Notes: EVH, endoscopic vein harvesting; OVH, open vein harvesting; SE, standard error; IV, inverse variance weighting; CI, confidence interval. The fixed-effects model was used for the analysis of all-cause mortality.

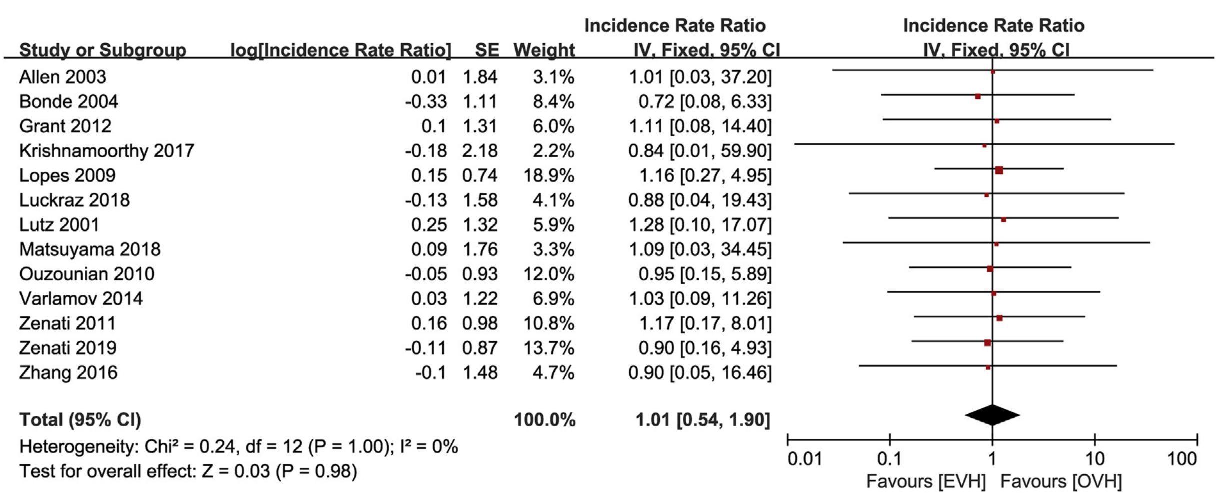

Fig. 3. Forest plot and meta-analysis of major adverse cardiac events.
Notes: EVH, endoscopic vein harvesting; OVH, open vein harvesting; SE, standard error; IV, inverse variance weighting; CI, confidence interval; MACE, major adverse cardiac events. The fixed-effects model was used for the analysis of MACE.

(Supplemental Table 2), suggesting that the period of study, with improved surgical expertise, may influence the conclusion from initial analysis.

3.6. Sensitivity analysis and publication bias

Pooled analysis of high-quality studies is exhibited in Supplemental Table 3. The results of sensitivity analysis did not change the conclusions for all-cause mortality, in-hospital death, MACE, 1-year graft patency and mid-term patency from the original analyses. Owing to data

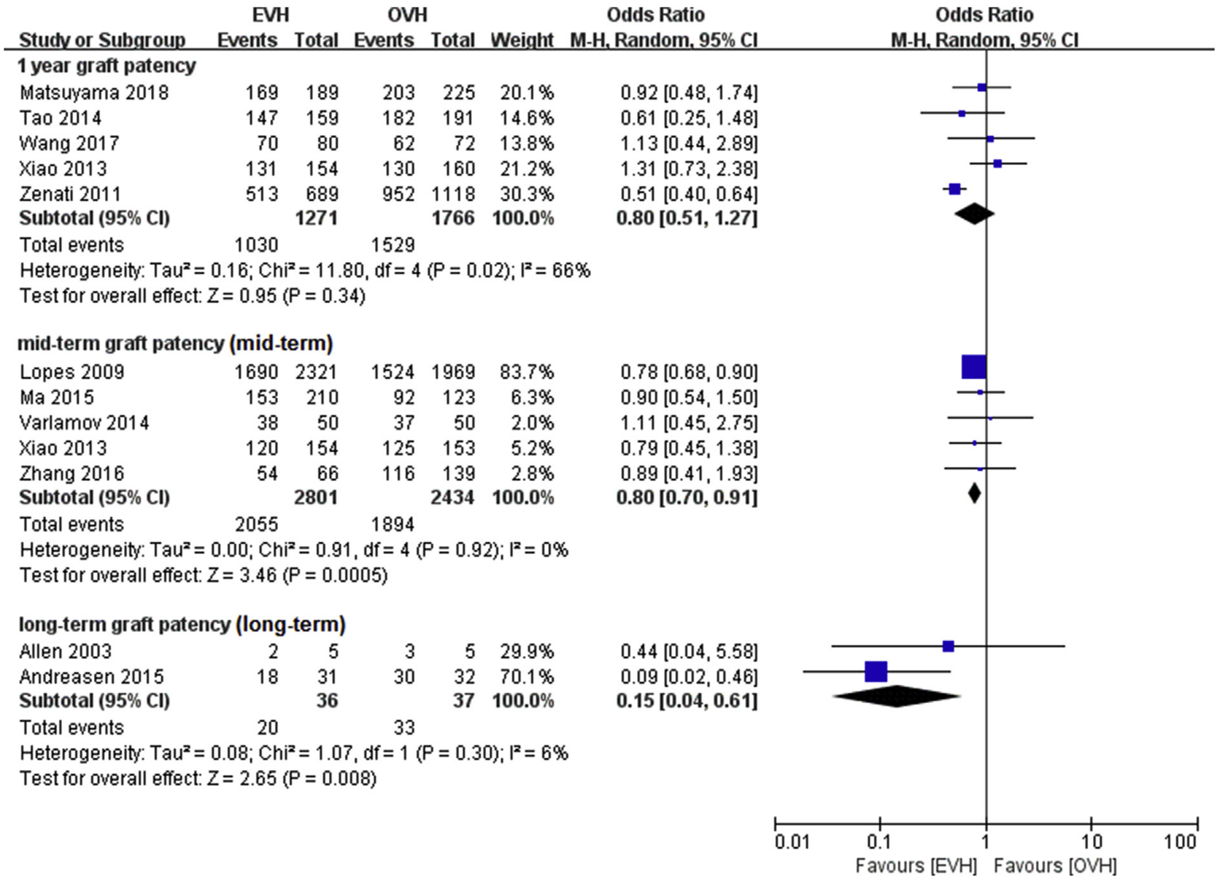

Fig. 4. Forest plot and meta-analysis of venous graft patency.

Notes: EVH, endoscopic vein harvesting; OVH, open vein harvesting; M − H, Mantel-Haenszel method; CI, confidence interval. Mid-term and long-term outcomes represent results of relevant endpoints after 1–5 years and 5–7 years of follow-up, respectively. The random-effects model was used for the analyses of graft patency.

insufficiency, sensitivity analysis for other endpoints were not performed.

Supplemental Figure 3 depicts the Begg's funnel plots for outcomes of interest. The Egger's test excluded the existence of publication bias in these analyzed endpoints, including all-cause mortality (P = 0.611), in-hospital death (P = 0.756), MACE (P = 0.978), 1-year graft patency (P = 0.124) and mid-term patency (P = 0.075).

4. Discussion

This systematic review with meta-analysis compares two techniques of vein harvesting for CABG: EVH and OVH, with a special focus on mid-term and long-term outcomes. No superiorities between the two techniques are found with regards to reoperation rate, post-operative early myocardial infarction, length of hospital stay, in-hospital death, all-cause mortality, MACE and one-year graft patency. Our results also indicate that EVH is associated with a higher incidence of intra-operative conduit injury and lower mid-long term graft patency, however, the period of study, with improved technical proficiency, may be related to better outcomes for conduit patency. Additionally, EVH decreases leg-wound complications after CABG. This systematic review with meta-analysis enables a better understanding of the endo-versus-open question in current evidence, offering state-of-the-art knowledge for better designing prospective studies to fully figure out this controversial question.

For endoscopic harvesting, uncertainty persists pertaining to mid-term and long-term outcomes, of which conclusive evidence is lacking in the literature. Some comparative studies were limited by insufficient follow-up, during which differences of some crucial endpoints like mortality or MACE had not yet become significant. Moreover, the strength of some studies was further reduced due to insufficient sample size, absence of randomization, and bias of patient selection [41,42]. The graft patency rate obtained from angiography shorter than one year is not as representative as that procured from one year onwards [41]. Long-term outcomes determine the clinical efficacy of EVH, as they are straightforwardly linked to patients' overall survival [43].

Our results demonstrate that EVH reduces mid-term and long-term patency rates as compared with OVH. However, the sample size for outcomes after 5 years of follow-up was on a relatively small basis. Long-term patency data are not always available, simply due to the fact that patient adherence to coronary angiography for follow-up is not as high as that to other endpoints, and the substantial loss of data during subsequent follow-up deteriorates the dilemma. Despite the limited data for long-term patency, this finding has already provided the latest evidence until more data are acquired from prospective studies. Data on mid-long term outcomes for EVH from previous studies are even conflicting, especially from those studies launched before 2011 [6]. Neither the PREVENT-IV trial (Project of Ex-Vivo Vein Graft Engineering via Transfection IV) [8] nor the ROOBY trial (Randomized On/Off Bypass) [9] favored the use of EVH, which was considered to jeopardize the mid-term outcomes. In contrast, results of the REGROUP Trial (Randomized Endovein Graft Prospective), which was launched in 2013, uncovered similar incidence of MACE between EVH and OVH over a follow-up period of 2.78 years [6]. One reasonable explanation for the contradiction is attributed to the expertise of harvesters. In the REGROUP trial, only experienced operators who had performed at least 100 EVH procedures with conversion rate lower than 5% were selected [6]. Our findings from subgroup analysis also support this explanation, and better mid-term patency was observed among those studies performed after 2011, as the growing harvesting experience may play a central role.

Indeed, the lack of proficiency in endoscopic harvesting may compromise the outcomes for CABG [7]. Endoscopic harvesting may result in excessive venous stretching and conduit trauma, which enhances further pathological changes in the endothelium, thus inducing graft atherosclerosis and occlusion [13,44]. Our results also suggest that graft injury is more frequently seen in EVH as compared with OVH, special concerns for this adverse event should be therefore alerted. Desai and colleagues [45] confirmed that inexperienced endoscopic harvesters are prone to produce more venous conduit trauma, advocating rigorous supervision of the learning curve for harvesters. Based on the regulations in our institution, only qualified, well-trained and skillful endoscopic harvesters are allowed to perform EVH. Endoscopic harvester is trained only when the trainee is fully proficient in OVH, as well as other peripheral vascular surgeries, and is intensively monitored by expert harvesters.

Endoscopic harvesting is not a technique of uniformity. However, this analysis was executed on the premise that surgical techniques amongst included studies were equivalent enough so as to be pooled together. In addition to harvesters' expertise, multiple factors may contribute to differences and heterogeneities, such as the device of endoscopic harvesting [46], anastomosis system [47], the use of off-pump CABG [9] and so forth. Furthermore, it should be noted that the majority of studies comparing EVH and OVH are not randomized, and blinding is always unachievable. Although no regional differences among subgroups were identified in this study, it should be pointed out that off-pump CABG is more favorable in Asian studies, with a relatively younger population of CABG patients.

It has been generally characterized that leg-wound healing is fantastic when EVH is applied, nonetheless, the paramount issue for CABG patients is long-term graft patency rather than wound healing. The no-touch harvesting, a non-traumatic technique, keeps a normal vascular architecture and offers excellent venous graft, of which the patency could be equivalent to the left internal thoracic artery at a follow-up period of 16 years [48]. Kim and colleagues [49] reported a 1-year patency rate of 97.4% using the no-touch method. Deb and colleagues [50] also stated that no-touch harvesting reduces the risk for graft occlusion at a 1-year follow-up. In an observational study by Mannion and colleagues, the venous grafts provided by EVH were reported to be inferior to the no-touch conduits in early patency rate [51]. Currently, the no-touch technique is hardly applied to endoscopic harvesting, however, it is increasingly used in open harvesting [52].

Our study has several limitations for which some of our findings should be interpreted with caution. First, one obvious limitation of the current study is the inadequacy of randomization and blinding. Most of the included studies were observational, and only five included studies are RCTs. Second, this systematic review was conducted on the assumption that demographics (age, sex, nationality, baseline characteristics and follow-up condition) were similar enough for further analyses, however, disparity always exists between study design settings and real-world practice. Third, data of this study are from different institutions with inhomogeneous technical expertise, giving rise to heterogeneity. The study time-span (over ten years), varying between-institution protocols for harvesting, and non-standardized harvesting devices will all invisibly influence the outcomes. Fourth, some outcomes of interest, especially the MACE, might not be clearly characterized in some studies. Unclear descriptions will lead to data omission and misinterpretation. Finally, we failed to identify significant differences in in-hospital death, all-cause mortality, and MACE. These endpoints, also widely used in many studies, are relatively severe, and the differences might have lost significance even if there is an evident difference in graft patency. For these endpoints, cumulative risks increase with the extension of follow-up.

In summary, besides the benefit of reducing harvest-site complications, EVH does not increase the risks for all-cause mortality and MACE as compared with.OVH. However, due attention should be given to the mid-long term patency rate for EVH, and surgical expertise is a vital factor ameliorating long-term patency. Further validation of our results is warranted and our conclusions should be refreshed by larger-scale studies with longer follow-up periods. Our findings highlight the imperative need for well-designed and rigorous prospective RCTs assessing long-term outcomes between these two harvesting techniques.

Ethical approval

This is a systematic review and meta-analysis, and there is no ethical approval needed.

Sources of funding

This study received no specific fundings.

Author contribution

Study design: Guanhua Li, Junmeng Zheng.
Data collection: Yu Zhang, Zhichao Wu.
Data analysis: Guanhua Li, Zhaoyuan Liu.
Writing: Guanhua Li, Yu Zhang.

Trial registry number

1. Name of the registry:Research Registry (https://www.researchregistry.com/).
2. Unique Identifying number or registration ID:Reviewregistry733.
3. Hyperlink to the registration (must be publicly accessible):https://www.researchregistry.com/browse-the-registry#registryofsystematicreviewsmeta-analyses/registryofsystematicreviewsmeta-analysesdetails/5d6013ff95025d00119b7661/

Guarantor

Guanhua Li.

Disclosure

All authors report no conflicts of interest in this work.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Data statement

We would like declare the data availability issue for the manuscript entitled"Mid-term and Long-term Outcomes of Endoscopic versus Open Vein Harvesting for Coronary Artery Bypass: A Systematic Review and Meta-analysis". The data used to support the findings of this study are available from the corresponding author upon request at dr.liguanhua@hotmail.com.

Declaration of competing interest

All authors report no conflicts of interest in this work.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://

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