

Endoscopic Radial Artery Harvesting Does not Compromise Graft Patency for Coronary Artery Bypass Graft: A Meta Analysis of 2782 Patients



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Background

Endoscopic radial artery harvesting is a favourable harvesting technique which provides excellent cosmetic result and low incidence of incision related complications, however the impact of this technique on graft quality is less well-explained. We sought to evaluate the impact of harvesting technique on graft patency and relevant clinical outcomes in patients undergoing coronary artery bypass graft (CABG).

Method

A systematic literature search was conducted to identify publications containing comparisons between different sampling skills in CABG, data was extracted and analysed with Revman, Downs and Black score was applied to evaluate the methodological quality of included studies.

Result

Ten studies containing 2782 patients were undertaken, the quality was generally acceptable. Pooled analysis results indicate endoscopic radial artery harvesting was associated with a lower incidence of wound infection and a similar incidence of haematoma formation compared with open harvesting. The difference in graft patency and all-cause mortality was insignificant between two cohorts.

Conclusion

Endoscopic radial artery harvesting is a safe technique and provides equivalent graft patency as compared with open harvesting, further investigation is required to confirm the aforementioned conclusion and evaluate the impact of harvesting technique on hand sensory and motor function.

Keywords

Radial artery • Endoscopic harvesting • Coronary artery bypass graft • Graft patency • Meta analysis

Introduction

Since reintroduced in the early 1990s [1,2], radial artery has been the second most popular graft after internal mammary artery, with better harvesting techniques and routine use of anti-spasm drugs, excellent outcomes have been reported by several groups [3,4]. To further improve the acceptance of radial artery as a conduit for coronary artery bypass graft (CABG), endoscopic radial artery harvesting (ERH) was

invented to circumvent the incision related morbidity and improve cosmesis as a full forearm scar left by open harvesting (OH) was relatively unsightly [5,6]. However, given the limited space of the harvesting tunnel, it is rational to postulate that invisible injury to the radial artery may be induced unintentionally either by harmonic scalpel or electrocautery [7]. It has been well established that the integrity of the endothelium is responsible for the normal function of vessels, any intimal damage might lead to the failure of the conduit

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which could result in recurrent angina and need for re-intervention [8].

ERH has significantly reduced the incision related morbidity, but the patency rate varies among studies and the impact of sampling skills on graft quality has not been fully elucidated yet [9]. In this article, we seek to evaluate the patency of radial artery, and all-cause mortality, on the patients as well as incision related complications such as wound infection and haematoma formation to determine whether ERH deserves increasing enthusiasm and widespread adoption in clinical practice.

Method

Literature Search

A thorough reference search without language restriction was carried out in databases including Pubmed, Embase and Cochrane library between 1966 to August 2013, to identify articles reporting the effect of ERH and OH on postoperative outcomes in patients undergoing CABG. The predefined search items were: endoscopic harvesting, radial artery, coronary artery bypass graft. A publication only in full-text was considered feasible for inclusion. While screening the obtained paper, we also searched relevant articles in the reference list manually for additional eligible information.

Inclusion and Exclusion Criteria

Papers meeting the following inclusion criteria were enrolled:

1. The main target of the paper was to report the clinical outcomes in patients who underwent radial artery for CABG with a comparison between endoscopic and open harvesting;
2. Use of endoscopic and open harvesting whether other minimally invasive techniques were used or not;
3. Reported outcomes included wound infection, haematoma formation, patency or occlusion of radial artery and all-cause mortality, a paper containing any of the outcomes aforementioned was considered adoptable;
4. When several papers reported on the same patient series, that with outcomes of interest and most complete data was included. In cases where open, endoscopic and other minimal invasive harvesting techniques were carried out concurrently, the data of open and endoscopic group was chosen for analysis.

The exclusion criteria contained several items as follows:

1. The paper only enrolled one group without a control which was drawn from the same population;
2. Incomplete outcomes reporting and the data for both techniques was impossible to calculate;
3. In vitro study, letter, commentary, technical report, and review were also excluded. Paper inclusion was permitted by two authors (Wu and Hu), when disagreement arose, a third investigator was invited to resolve the dissension.

Data Extraction and Quality Assessment

Data was extracted by two independent reviewers (Wu and Hu) using a standard extracting data form, including author

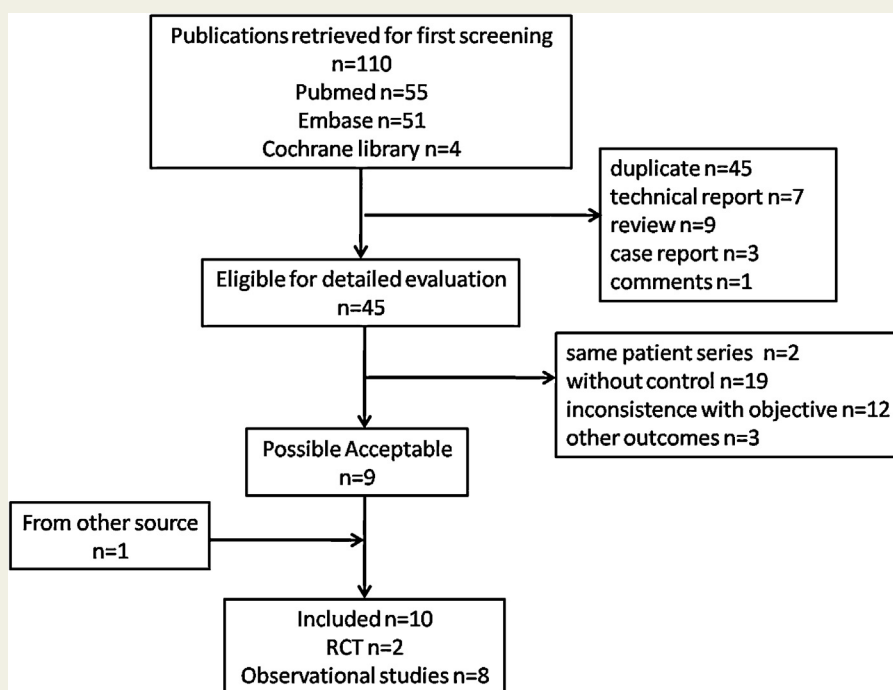


Figure 1 Flowchart of the publication inclusion.

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