

Reviewer #1:

Scientific Quality: Grade C (Good)

Language Quality: Grade B (Minor language polishing)

Conclusion: Major revision

Specific Comments to Authors: This is a prospective, single center RCT, with 299 consecutive patients who underwent coronary angiography or percutaneous coronary intervention seeking to compare the pulse oximeter versus the traditional radial artery palpation for successful patent hemostasis. The authors concluded that the use of pulse oximeter increased the probability of achieving patent hemostasis compared to artery palpation and was associated with lower rates of artery spasm.

Authors: We thank the reviewer for his/her time and valuable comments and we are willing to address all of his/her concerns.

Reviewer #1:

This reviewer has the following concerns about this paper. Major: 1. The authors did not explain the reason of older adults as in an independent predictor of patent hemostasis of radial artery. They should speculate the reason in the discussion.

Authors: This is a very important comment. A possible explanation is that radial artery spasm is more frequent in younger (vs older) patients undergoing percutaneous coronary interventions via radial access (*Varenne O, et al. Catheter Cardiovasc Interv. 2006;68(2):231-235, Jia DA, et al. Chin Med J(Engl) 2010;123(7):843-847, Rathore S, et al. JACC Cardiovasc Interv 2010;3:475–83, Hee HwaHo et al. Cardiovasc Revasc Med. 2012;13(3):193-5*) and therefore older adults are more likely to have a successful patent hemostasis. Alternative explanations might be that increased arterial stiffness in elderly patients produce a steeper increase in radial artery flow, hence, reopening the occlusion in the early period and maintain vessel patency in the long-term or preclude the total interruption of flow during manual compression and therefore facilitate patent hemostasis (*Buturak A, et al. Cardiol J. 2014;21(4):350-6*).

“In the current study we observed an association between increased age and successful patent hemostasis. Several speculations can be made regarding this finding. Firstly, radial artery spasm is more frequent in younger (vs older) patients undergoing percutaneous coronary interventions via radial access (Varenne O, et al. Catheter Cardiovasc Interv. 2006;68(2):231-235, Jia DA, et al. Chin Med J(Engl) 2010;123(7):843-847, Rathore S, et al. JACC Cardiovasc Interv 2010;3:475–83, Ho HH et al. Cardiovasc Revasc Med. 2012;13(3):193-5) and therefore older adults are more likely to have a successful patent hemostasis. Secondly, increased arterial stiffness in elderly patients produce a steeper increase in radial artery flow, resulting in reopening of the occlusion in the early period and maintaining of vessel patency in the long-term. Lastly, increased arterial stiffness in older patients may preclude the total interruption of flow during manual compression and therefore facilitate patent hemostasis (Buturak A, et al. Cardiol J. 2014;21(4):350-6).” Page 13, 3rd Paragraph

Reviewer #1:

2. The difference between the present study and previous studies, which were also studied the patent radial patent hemostasis, was not clearly described. In other words, the authors should indicate the novelty of this RCT more clearly in the abstract and main manuscript.

Authors: We thank the reviewer for the comment. In the current study patent hemostasis was estimated with the use of a pulse oximeter which is a simple and widely available method of radial artery patency evaluation. Previous studies utilized more sophisticated methods to evaluate radial artery patency. For example, in the **RACOMAP study** (*Radial compression guided by mean artery pressure versus standard compression with a pneumatic device*) the investigators used a pneumatic compression guided by mean arterial pressure. To insufflate the pneumatic device in mean arterial pressure group patients, a specific insufflator was developed using readily accessible tools available in a catheterization laboratory (**Cubero JM, et al. Catheter Cardiovasc Interv. 2009;73(4):467-72**). In the study by Edris et al (**Edris A, et al. EuroIntervention. 2015;11(7):765-71**), patency was assessed using

plethysmography and pulse oximetry while the ipsilateral ulnar artery was occluded (reverse Barbeau). Radial artery patency was documented if present; otherwise, the TR Band (Terumo Medical device) was slowly deflated until plethysmographic signal returned in order to restore radial patency. The compression balloon was then further deflated until either bleeding occurred or a minimum balloon volume of 7 mL was achieved. The compression balloon was then reflatd 2 mL above the bleeding point or left with a minimum of 7 mL of air. The TR Band remained in place for two hours and was then removed. After the feasibility assessment, the investigators began to employ one or other of two different TR Band deflation strategies (standard vs rapid deflation technique). Lastly, in ***PROPHET-II trial*** (Prevention of Radial Artery Occlusion After Transradial Catheterization) after applying the inflatable band (TR band, Terumo Interventional Systems) at the sheath entry site, the ipsilateral ulnar artery was compressed at the Guyon's canal by placing a cylindrical composite made by wrapping 4 inch x 4inch gauze around a 1-inch plastic needle cap, or the barrel of a 3 ml plastic syringe, and compressing it using a circumferentially applied Hemoband (Hemoband Corporation, Portland, Oregon) (***Pancholy SB, et al. JACC Cardiovasc Interv. 2016;9(19):1992-1999***).

Abstract:

“Radial artery obstruction is the most common complication of coronary angiography performed via trans-radial access. Patent hemostasis can significantly reduce the risk of radial artery occlusion. Previous studies utilized sophisticated methods to evaluate radial artery patency. Simplified and easily applicable methods for successful patent hemostasis are currently lacking. Page 3, 1st Paragraph

Patent hemostasis with the use of pulse oximeter is a simple, efficient and safe method, worthy of further investigation. Larger randomized studies are required to consider its clinical implications.” Page 4, 2nd Paragraph

Introduction:

“The goal of the present study is to evaluate a simplified and easily applicable method to achieve patent hemostasis in patients undergoing diagnostic coronary angiography or percutaneous coronary interventions (PCI).” Page 6, 1st Paragraph

Discussion:

“The best technique to achieve patent hemostasis is a subject of research. Previous studies utilized relatively sophisticated methods to evaluate radial artery patency.”

Page 12, 2nd Paragraph

Reviewer #1:

3. As the authors have already suggested, there is a bias in the evaluation of 30-day follow-up results. Although they only analyzed 204 out of 299 patients, the authors did not show the reason of lacking data. This number can not be ignored.

Authors: We agree with the reviewer that this is a study limitation. We performed a telephone follow-up in those patients who didn't show-up at 30 days. The three main reasons cited for follow-up interruptions were lack of understanding regarding the necessity of follow-up, social reasons (distant hometown, financial barriers, relocation) and unawareness of appointment schedule. Nevertheless, radial artery flow was restored in a significant percentage of patients who presented at follow-up, which is in accordance with the current literature. This information has been added in the Limitation Section. **(Page 14, 1st Paragraph)**

Reviewer #1:

Minor 1. Page line 3 radial artery occlusion (RAO) 2. Page3 line 11 PROPHET study abbreviation should be explained in the first appearance. 3. Page 3 line 17 In PROPHET-II Trial (PROPhylactic Hyperperfusion Evaluation Trial) ipsilateral 4. Page 3 line 20 RACOMAP show the full spelling in the first appearance.

Authors: The manuscript has been edited based on the reviewer's comments.

(1) Science editor: 1 Scientific quality: The manuscript describes a prospective study of the patent hemostasis of radial artery. The topic is within the scope of the WJC. (1) Classification: Grade C; (2) Summary of the Peer-Review Report: The authors concluded that the use of pulse oximeter increased the probability of achieving patent

hemostasis compared to artery palpation and was associated with lower rates of artery spasm. However, the manuscript needs major revision. The questions raised by the reviewer should be answered; and (3) Format: There are 5 tables and 1 figure. (4) References: A total of 27 references are cited, including 7 references published in the last 3 years; (5) Self-cited references: There is 1 self-cited reference. The self-referencing rates should be less than 10%. Please keep the reasonable self-citations that are closely related to the topic of the manuscript, and remove other improper self-citations. If the authors fail to address the critical issue of self-citation, the editing process of this manuscript will be terminated; and (6) References recommend: The authors have the right to refuse to cite improper references recommended by peer reviewer(s), especially the references published by the peer reviewer(s) themselves. If the authors found the peer reviewer(s) request the authors to cite improper references published by themselves, please send the peer reviewer's ID number to the editorialoffice@wjgnet.com. The Editorial Office will close and remove the peer reviewer from the F6Publishing system immediately. 2 Language evaluation: Classification: Grade B. 3 Academic norms and rules: The authors provided the Biostatistics Review Certificate, and the Institutional Review Board Approval Form. Written informed consent was waived. No academic misconduct was found in the Bing search. 4 Supplementary comments: This is an invited manuscript. No financial support was obtained for the study. The topic has not previously been published in the WJC.

Authors: We thank the Science editor for the detailed comments.

Science editor: Issues raised: (1) The title is too long, and it should be no more than 18 words;

Authors: The title has been shortened based on the Science editor comment.

“Patent hemostasis of radial artery: Comparison of two methods”

Science editor: (2) The authors did not provide original pictures. Please provide the original figure documents. Please prepare and arrange the figures using PowerPoint to ensure that all graphs or arrows or text portions can be reprocessed by the editor;

Authors: Per Science editor comment, the original figure documents have been provided.

Science editor: (3) The “Article Highlights” section is missing. Please add the “Article Highlights” section at the end of the main text.

Authors: The “Article Highlights” section has been incorporated in the manuscript.

Research background: Radial artery obstruction is a frequent complication of coronary angiography performed via trans-radial access. Maintaining circulatory antegrade flow in the radial artery during hemostasis (patent or non-obstructive hemostasis) reduces the risk of radial artery obstruction.

Research motivation: Simplified and easily applicable methods for successful patent hemostasis are currently lacking.

Research objectives: To determine which method (pulse oximeter versus the traditional radial artery palpation) is better to achieve patent hemostasis.

Research methods: This is a prospective, single center study, which included 299 consecutive patients who underwent coronary angiography or percutaneous coronary intervention between November 2017 and July 2019. Exclusion criteria included: a) age < 18 years old, b) history of radial artery disease, c) no palpable artery pulse. Patients were randomly assigned into two groups. In the first group, radial artery flow was assessed by palpation of the artery during hemostasis (traditional method). In the second group, radial artery patency was estimated with the use of a pulse oximeter. Two different compression devices were used for hemostasis (air chamber and pressure valve). The primary endpoint of the study was the achievement of successful patent hemostasis.

Research results: The two groups (pulse oximeter vs artery palpation) had no significant differences in age, sex, body mass index, risk factors and comorbidities except for supraventricular arrhythmias. The percentage of patients with successful patent hemostasis was significantly higher in the pulse oximeter group (82.2% vs 68.1%, $p = 0.005$). A lower percentage of patients with spasm was recorded in the pulse oximeter group (9.9% vs 19.0%, $p = 0.024$). In the multivariate analysis, the use

of pulse oximeter (Odds Ratio (OR): 2.35, 95% Confidence Interval (CI): 1.34 - 4.13, $p = 0.003$) and advanced age (OR: 1.04, 95% CI: 1.01 - 1.07, $p = 0.006$), were independently associated with an increased probability of successful patent hemostasis. The type of hemostatic device did not affect patent hemostasis ($p = 0.450$).

Research conclusions: Patent hemostasis with the use of pulse oximeter is a simple, efficient and safe method, worthy of further investigation.

Research perspectives: Larger randomized studies are required to consider its clinical implications.

Science editor:

Recommendation: Conditional acceptance.

(2) Editorial office director:

(3) Company editor-in-chief: I have reviewed the Peer-Review Report, full text of the manuscript, and the relevant ethics documents, all of which have met the basic publishing requirements of the World Journal of Cardiology, and the manuscript is conditionally accepted. I have sent the manuscript to the author(s) for its revision according to the Peer-Review Report, Editorial Office's comments and the Criteria for Manuscript Revision by Authors.

Authors: We are grateful to the company editor in chief for the encouraging comments