

Therapeutic occlusion of the internal mammary arteries to relieve refractory angina

To the Editor,

With great interest, I read the article by Sahebjamí^[1] and associates about the effects of enhanced external counterpulsation (EECP) in coronary artery disease patients with and without diabetes. Despite the encouraging results revealed in this study in nondiabetic patients, indicated as the reduction of pain frequencies, and despite the technology of EECP has been thoroughly refined since the early 1960s, EECP has had difficulty disseminating in routine clinical practice and remains ignored at many centers worldwide. Similarly, stem cell therapies, cardiac shock wave therapy, stellate ganglion blocks, spinal cord stimulation, and vascular endothelial growth factor gene therapy have failed to meet expectations. Only use of the coronary sinus reducer, in the past few years, seems to have spread more exuberantly; however, perhaps effective sponsoring by the stent industry has played a role behind its faster rise in popularity. Furthermore, apart from initial encouraging results, studies remain necessary before assessing this technology's mid- and long-term outcomes. In such a heterogeneous context of attempts to relieve refractory angina (RA), therapeutic occlusion of the internal mammary arteries (IMAs) has been proposed.^[2] In actuality, ligation of the IMAs was an established therapy for ischemic heart disease in the fifties, in an era during which the cardiopulmonary bypass machine was in its infancy and direct, on-pump coronary

surgery did not exist.^[3] Access was via the third or fourth intercostal space bilaterally, with a small incision to reach the right and left IMAs at a point distal to the origin of the pericardiophrenic branch. Ligation was thought to divert blood flow to the heart via an anastomotic microvascular network. Although results in hundreds of patients were encouraging^[3] and some publications were outstanding, after the start of the cardiopulmonary bypass era, all debate regarding IMA occlusion ceased, and it fell into absolute oblivion for 50 years, until the principle was resurrected for no-option RA patients in 2010.^[2] Apart from the microvascular network studied by previous authors, we now have angiographic evidence that new collaterals can develop from the patent proximal stump of an IMA,^[4] occluded within its mid-distal segment, to reach ischemic heart; and that, sometimes, a branch may join a coronary artery directly. Hence, interventional therapy employing embolization or plug occlusion of an IMA has been proposed.^[5] The collateral flow index, fractional flow reserve, intracoronary ECG, and anginal symptoms have all been recently demonstrated to improve when the ipsilateral IMA is occluded.^[6] These recent findings confirm that the old principle of IMA occlusion had a strong rationale, and suggest that it would be worthwhile further studying its effects in RA.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Marco Picichè

Department of Cardiac Surgery, San Bortolo Hospital,
Via F. Rodolfi 37, Vicenza, Italy

Address for correspondence: Dr. Marco Picichè,
Department of Cardiac Surgery, San Bortolo Hospital,
Via F. Rodolfi 37, Vicenza 36100, Italy.
E-mail: marco.piciche@libero.it

Submitted: 30-Aug-2019

Accepted: 26-Sep-2019 **Published:** 22-Jan-2021

REFERENCES

1. Sahebajami F, Madani FR, Komasi S, Heydarpour B, Saeidi M, Ezzati K, *et al.* Refractory angina frequencies during 7 weeks treatment by enhanced external counterpulsation in coronary artery disease patients with and without diabetes. *Ann Card Anaesth* 2019;22:278-82.
2. Picichè M, Kingma JG Jr, Fadel E, Dagenais F, Robillard J, Simard D, *et al.* Enhancement of noncoronary collateral circulation: The hypothesis of an alternative treatment for ischemic heart disease. *Med Hypotheses* 2010;74:21-3.
3. Picichè M. The history of myocardial revascularization before the advent of cardiopulmonary bypass. In: Picichè M, editor. *Dawn and Evolution of Cardiac Procedures: Research Avenues in Cardiac Surgery and Interventional Cardiology*. Heidelberg: Springer-Verlag; 2012. p. 65-77.

4. Picichè M. Noncoronary collateral myocardial blood flow: The human Heart's forgotten blood supply. *Open Cardiovasc Med J* 2015;9:105-13.
5. Picichè M. Embolization of the internal thoracic arteries in refractory angina. *Int J Cardiol* 2016;212:310.
6. Stoller M, Seiler C. Effect of permanent right internal mammary artery closure on coronary collateral function and myocardial ischemia. *Circ Cardiovasc Interv* 2017;10:e004990.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

Access this article online	
Quick Response Code: 	Website: www.annals.in
	DOI: 10.4103/aca.ACA_124_19

How to cite this article: Piciche M. Therapeutic occlusion of the internal mammary arteries to relieve refractory angina. *Ann Card Anaesth* 2021;24:115-6
 © 2021 Annals of Cardiac Anaesthesia | Published by Wolters Kluwer - Medknow