Pediced versus in situ internal thoracic artery: A petition for consistency in communication

Hadi Daood Toeg, MD, MSc, and Fraser Douglas Rubens, MD, MSc, FACS, FRCSC

"How often misused words generate misleading thoughts."

—Herbert Spencer, *Principles of Ethics*,
Volume 1; 1879¹

Clarity is the sine qua non of effective communication, and thus it is essential that journals advocate that clinical researchers consider appropriate and consistent descriptions in their submissions. It is in this context that this editorial aims to elucidate the use of the terms *pediced* and *in situ* as they refer to harvest of the internal thoracic artery (ITA) in coronary artery bypass surgery^{2,3} to facilitate the sharing of clinical information in this field of cardiac surgery.

Pedicle, from the Latin word *pediculus* meaning small foot, is described in the *Oxford English Dictionary* as "a small stalk-like structure connecting an organ or other part to the human body"^{4,5} In general, all medical dictionaries including *Stedman's*, *Taber's*, and *Dorland's*, present the consensus understanding that the term *pedicle* means, "a constricted portion or stalk, by which a nonsessile tumor is attached to normal tissue, or a stalk through which flap of tissue is vascularized, permitting transfer to another site,"⁶⁻⁸ The anatomic definition with regard to the vertebral arch, in which the pedicle is the segment *joining* the transverse process and the vertebral body, is consistent with this definition.

In plastic surgery, the term *pediced flap* refers to a tissue island that retains a donor site attachment.^{9,10} This is a flap that is transported to a new location while keeping the stalk intact with its original blood supply,¹¹ such as with the pediced transverse rectus abdominus muscle in breast reconstruction.¹² Our plastic surgery colleagues subsequently popularized the concept of a *free flap*, which involved detaching the tissue and blood supply from its original location and transferring it to a new one, with microvascular techniques used to ensure viability.¹³ In summary, these

terms have been used in a clear manner in the reconstructive surgical literature, consistent with the original etymology.

The inconsistent and confusing use of the terms *pedicle* and *in situ* with respect to the preparation of the ITA have unnecessarily complicated the cardiac literature. A recent meta-analysis by Deo and colleagues¹⁴ perpetuates this misunderstanding by comparing outcomes of different harvesting or grafting techniques in coronary artery bypass grafting. Deo and colleagues¹⁴ describe that the pedicle group as consisting of those undergoing "conventional method for ITA harvest" and compare this group with those in whom skeletonization was performed. They concluded that "while BITA [bilateral ITA] was associated with increased risk of deep sternal wound infections compared to LITA [left ITA], this was limited to patients with a pediced harvesting approach," implying that the adjective *pediced* is the antonym to the adjective *skeletonized*. This particular definition of *pediced* reflects that described by Sá and associates¹⁵⁻¹⁷ as a technique involving "dissect[ing] the artery away from the sternum with its accompanying veins, fascia, adipose tissue and lymphatics, generating a pediced graft." Other groups have used this definition in their reports, including Kai and colleagues,¹⁸ who compared patency rates between off-pump skeletonized bilateral ITA grafting versus on-pump "pediced" bilateral ITA grafting.

To clarify that grafts remained attached proximally to the subclavian artery (not free), these and other authors have used the Latin term *in situ*. The *Oxford English Dictionary* specifies that the term *in situ* may be used as an adjective or adverb, reflecting something "in its original place."^{4,5} Clearly, the transfer of the end of the vessel to an entirely different site for an anastomosis is not consistent with this definition.

We believe that the proper use of the term *pediced* in the context of coronary grafting was first presented in this Journal by Kushwaha and coworkers.¹⁹ These authors highlighted the important potential physiologic relevance of the changes in vascular and nervous supply after dividing the proximal connecting stalk. Furthermore, in a large series of multiple arterial grafting the implied definition of *pediced* related to the use of the ITA with its proximal connection intact, as opposed to a free graft, with no reference to the degree of skeletonization during harvesting.²⁰

We propose that our specialty journals encourage a simple and logical descriptive process involving 2 dichotomous variables relating to ITA preparation. First, the terms

From the Division of Cardiac Surgery, University of Ottawa Heart Institute, Ottawa, Ontario, Canada.

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Address for reprints: Fraser Douglas Rubens, MD, MSc, FACS, FRCSC, Division of Cardiac Surgery, University of Ottawa Heart Institute, 40 Ruskin St, Ottawa, Ontario, Canada (E-mail: frubens@ottawaheart.ca).

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skeletonized and *nonskeletonized* appropriately reflect the degree of isolation of the artery from the surrounding tissue in the conduit.^{21,22} Second, when the proximal connection of the conduit to the subclavian artery is preserved, it is a pedicled graft, whereas when it is divided, it is a free graft. The term *in situ* should be reserved as a descriptor for situations in which the proximal and distal connections of the vessel are intact. For example, “the vessel was skeletonized in situ until the heparin was given, and then it was divided distally.”

In summary, this editorial comprises a plea to consider the universal acceptance of 2 simple, reproducible dichotomous descriptions of ITA harvest and grafting. The ITA has proven extraordinary longevity and consistency as a conduit, and we owe it as practitioners to embrace descriptive terms as useful and consistent as the conduit itself.

I have labored to refine our language to grammatical purity, and to clear it from colloquial barbarisms, licentious idioms, and irregular combinations.

—Samuel Johnson, *The Rambler*,
Section 208; 1752²³

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