tional advantage of protecting the GEA from injury during a future abdominal operation.[3]

In summary, vascular reactivity of arterial grafts depends on which segment is used for the anastomosis. Likewise, the artery tested to vasoconstrictors in vitro may also have different reactivity, depending on which segment was used. Ideally, the distal segments should be discarded, to minimize the risk of vasospasm.

I would like to encourage Dr. He to compare the pharmacologic reactivity of different segments of the GEA, to confirm my clinical observations.

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**12/8/67866**

*Reply to the Editor:*

Dr. Dietl raised a very important issue regarding the segmental difference of the reactivity of coronary bypass grafts, related to our paper entitled "Comparison Among Arterial Grafts and Coronary Artery: An Attempt at Functional Classification" (J THORAC CARDIOVASC SURG 1995;109:707-15). Dr. Dietl's clinical observations that the reactivity of the gastroepiploic artery (GEA), like that of the internal thoracic artery (ITA), as demonstrated in the previous work,[1] is also related to the diameter and the segmental location in the artery (i.e., the more distal, the more reactive). Therefore, the distal end of the GEA, like that of the ITA, should not be used. These observations are in accordance with recommendations of other surgeons. For example, as indicated in Dr. Dietl's letter, this is also suggested by Grandjean and associates,[2] although their suggestion was based only on the fact that the diameter of the distal end of the GEA is too small for coronary bypass grafting, without consideration of reactivity.

As demonstrated before, the diameter of the ITA at the distal end is inversely correlated with the reactivity. It may be presumed that this may also be true in other arterial grafts, as observed clinically by Dr. Dietl, although experimental studies in other arterial grafts with regard to the segmental differences are lacking. To our understanding, all arterial grafts for coronary artery bypass grafting are conduit arteries and their physiologic function is to carry blood flow to organs. Because the organs they supply have varying physiologic functions, these arteries have adapted to the diverse demand for blood supply to individual organs. Therefore, the structure and the reactivity of these arteries vary, and for that reason some of them are more spastic (more reactive to vasoconstrictors) than others. On the basis of this concept, we designed the study that led to the functional classification in the aforementioned publication. We attempted to functionally classify arterial grafts mainly according to their reactivity to vasoconstrictors. The anatomic features and the embryologic considerations were also taken into account. Because the attempt was to classify those grafts functionally, we did not emphasize the segmental difference for each arterial graft.

However, the segmental differences of the arterial grafts were also considered in the study design. We realized that it is unfair to compare different portions among arterial grafts with regard to reactivity, because we know that there is a difference along whole length of the artery. On the basis of the knowledge that the distal end of the ITA is the most reactive portion, we presumed that this is also true in other arterial grafts and we tried to use this part of the graft for comparison whenever possible. For example, all ITA segments used in the study were taken from the distal portion ($n$ = 14 for endothelin-1, $n$ = 15 for U46619, $n$ = 15 for potassium, and $n$ = 13 for norepinephrine). The GEA used for the study was also taken from the distal portion ($n$ = 7 for each vasoconstrictor). Similar consideration was also given to the IEA. Therefore, the conclusion that the reactivity of GEA is higher than that of other arteries is objective. The only exemption in the study with regard to the location of the segment is the coronary artery. The coronary artery segments were taken from the explanted hearts, usually from large epicardial arteries, which are obviously not the distal ends. However, the coronary artery has been demonstrated to be a reactive artery even at the epicardial portion[3, 4]; therefore, it is reasonable to use this part to compare with the arterial grafts. In addition, it is this part of the coronary artery that is anastomosed to the arterial grafts, and this fact makes the comparison more reasonable.

We appreciate the encouragement of Dr. Dietl regarding testing the segmental difference of the GEA.

We would like to take this opportunity to further express our view on arterial grafts.

1. Arterial grafts may be functionally classified as less spastic type I (somatic arteries supplying the body wall, i.e., ITA, IEA, the subscapular artery, and the intercostal artery), more reactive type II (splanchnic arteries supplying visceral organs, i.e., GEA, the splenic artery, the left gastric artery), or type III (limb arteries—specific somatic arteries supplying limbs, i.e., the radial artery).

2. Arterial grafts are *arteries.* No part of any arterial grafts is a nonreactive artery—a truly "passive conduit."[5] In other words, all arterial grafts are reactive conduits. The only difference is the extent of reactivity.

3. All arterial grafts for coronary bypass grafting are *conduit arteries.* The reactivity of the grafts is variable along the length. As demonstrated in the ITA, the main portion (the midportion composes more than 60% of the total length of the graft) of the ITA is less reactive than

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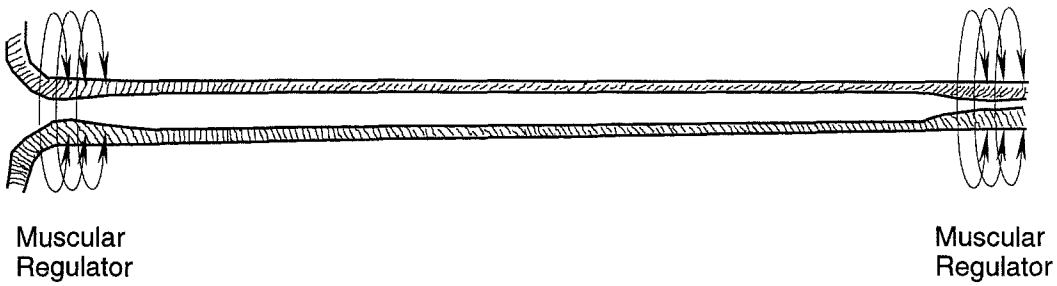


**Fig. 1.** Schema showing the concept that all arterial grafts for coronary artery bypass grafting are conduit arteries. The muscular regulators are located at both ends to regulate blood flow to organs and to distribute blood flow according to the need of the organ and the hemodynamic status of the whole body. In comparison, the distal end is more important in regulating the flow because this part of the artery is highly reactive and is in diameter the smallest part of the artery.

the distal portion and may be less reactive than the proximal portion as well.[5] This may also be true in other arterial grafts such as the GEA, IEA, and the radial artery. By combining histologic findings,[6] we may draw a schema for conduit arteries as shown in Fig 1. This figure shows that although arterial grafts (conduit arteries) at the full length are reactive, the major muscular components are located at the two ends of the artery (muscular regulator). In particular, the distal end is more efficient as the flow regulator because this part contains relatively more smooth muscle cells and is smaller in diameter. Those characteristics are physiologically important in regulating blood flow distribution. However, when such arteries are used as bypass grafts, those characteristics may be detrimental. In terms of preventing vasospasm of the arterial grafts, trimming off the small and highly reactive distal end of the grafts (ITA, GEA, IEA, or other grafts) may be important and clinically feasible. This concept has been widely accepted for ITA grafting since the original proposal.[1] Dr. Dietl (in his letter) and others[2] have mentioned that this is also feasible for the GEA.

4. The use of vasodilators during preparation of arterial grafts is a recommended method to prevent or relieve vasospasm even though the distal end of the grafts is not used for grafting, because all portions of arterial grafts are reactive arteries and usually have a rather small diameter compared with the saphenous vein.[7] The choice of vasodilators is discussed elsewhere.[7]

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**12/8/67867**

## Ostioplasty for isolated coronary artery ostial stenosis

*To the Editor:*

In a letter to the Editor, Dihmis and Hutter[1] caution the authors van Doorn and Nair[2] about the use of left main coronary ostioplasty for isolated ostial lesions of the coronary arteries. They recount the case of a patient who required urgent reoperation for what was thought, but never proved, to be thrombosis of the left system. When we[3] reported our first 14 cases of this operation, we also cautioned that coronary spasm could occur after this operation, inasmuch as it had been observed in one of our patients.