Exercise Testing in Variant Angina

In the August 1978 issue of Chest, Weiner and associates\(^1\) reported the case histories of four patients who developed ST-segment elevation following exercise. One of their patients (case 1) had previously experienced recurrent pain in the chest at rest, which was associated with transient ST-segment elevation, arrhythmias, and heart block; this patient clearly meets the criteria for variant angina pectoris.\(^2\) This patient is unique in that the ST-segment changes that developed immediately after exercise were remarkably similar to those recorded during spontaneous attacks. The other three patients did not have documented ST-segment elevation during spontaneous pain prior to the exercise test; and in this respect, they are similar to previous reports of patients with “variant angina” and ST-segment elevation associated with an exercise test.\(^3\)\(^4\) Even though these three patients did not meet a strict definition of variant angina prior to the exercise test, they may still represent part of the spectrum of variant angina which has not previously been published.

As will be seen, a careful definition of variant angina and a clarification of its relation to the other subsets of patients with ischemic heart disease are of signal importance. Failure to achieve such clarification has already led to unnecessary controversy regarding the place of surgery in the management of patients with variant angina.

In 1974, we reviewed our experience with the surgical management of variant angina and concluded that the results of aortocoronary bypass surgery in patients with variant angina were not as good as in those with classic angina.\(^6\) Later, Shubrooks and associates concluded that “most patients [with variant angina] with significant fixed coronary lesions will do well after coronary bypass surgery;\(^7\)\(^14\) however, many of their patients simply exhibited ST-segment elevation during a period of unstable angina and did not meet the definition of variant angina.\(^8\)

Because our initial report contained data from only 26 patients and because there was a lack of agreement on the place of aortocoronary bypass surgery in the treatment of variant angina, we again reviewed the literature with respect to surgically treated patients with variant angina during the period of 1974 through 1975. These results (in over 75 patients) were remarkably similar to those in our initial report; perioperative infarction and mortality were excessive, and symptomatic improvement (in the absence of infarction) occurred in less than 50 percent.\(^9\)

Similarly, Wiener and associates\(^10\) reported suboptimal surgical results in patients with carefully documented coronary arterial spasm; only 50 percent showed improvement, 22 percent had myocardial infarction, and the early mortality was 22 percent. In contrast, Johnson et al\(^11\) reported better results in a heterogeneous group of patients with ST-segment elevation during pain (some of which clearly were in an unstable phase of classic angina).

While these reports have contributed to a continuing controversy,\(^12\) most of the disagreement regarding the place of surgery in treating variant angina is unnecessary. Certainly, there is little reason to attempt aortocoronary bypass surgery in patients with normal coronary arteriograms or in those with insignificant obstructive lesions, even in the presence of severe and disabling symptoms. Except under unusual circumstances, single-vessel disease is not considered a surgical lesion in classic angina, and this is probably also true in variant angina. Unfortunately, the results of surgery in those patients with carefully defined variant angina and fixed lesions remain inferior to the results obtained in patients with classic angina; thus, it would seem that we need more refined criteria for the selection of surgical candidates.

While disabling symptoms and fixed coronary lesions are essential, we do not have an ideal set of criteria for the selection of candidates for surgery. The exercise test may be useful in this regard. Weiner and associates reviewed the literature on exercise tests through January 1977 and concluded that “contrary to the prevailing belief, over half of the patients with Prinzmetal’s variant angina have electrocardiographic changes diagnostic of ischemia during exercise testing.”\(^1\)\(^2\)\(^3\)\(^4\) Our experience has been more in keeping with the popular concept that although an abnormal exercise test is not rare, exercise tolerance is generally preserved in patients with variant angina.\(^13\)

A typical example of ST-segment elevation (during pain at rest) and a normal exercise test are
shown in Figure 1. This patient was experiencing multiple attacks of angina at rest on a daily basis, at a time when the exercise test was unquestionably normal; selective coronary arteriograms revealed a high-grade obstructing lesion of the proximal right coronary artery and a normal left coronary artery.

The results of exercise testing and coronary arteriograms from the studies reviewed by Weiner et al\(^1\) are summarized in Figure 2; this diagram also includes the four cases of Weiner et al\(^1\) and five previously unreported cases of typical variant angina from our institution. It is apparent that an abnormal exercise test in variant angina is not at all unusual. Furthermore, this analysis emphasizes that a normal exercise test in variant angina has no utility in predicting the results of coronary arteriograms; the high incidence of normal exercise tests in the presence of an abnormal coronary arteriogram is probably due to the high incidence of single-vessel disease in these patients. Likewise, ST-segment elevation during an exercise test is of little value in predicting coronary anatomy. In contrast, ST-segment depression during an exercise test is extremely rare in patients with variant angina and normal coronary arteriograms.

For these reasons, the exercise test may prove useful in selecting patients with variant angina for aortocoronary bypass surgery. Although we presently do not know if patients with fixed lesions on angiograms and abnormal exercise tests (ST-segment depression) are more likely to benefit from surgery than those with fixed lesions and normal exercise tests, it is likely that patients with fixed atherosclerotic lesions and minor components of coronary spasm are better candidates for surgery than are patients with lesions and superimposed intense coronary spasm. Many of the reported cases of variant angina do not include the results of exercise testing; and even when such data are presented, the results of medical or surgical therapy and other follow-up information are not available. Pharmacologic provocative tests for coronary spasm may eventually prove to be useful in identifying those patients with important spasm, but exercise testing is more widely applicable, is certainly easier, and is probably safer. Clearly, we need more information regarding the prognostic value of an exercise test in patients with variant angina.

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The Plural Umbrella

Who would have thought that the battle of the sexes would be fought on editorial pages with the strategies of semantics and the weapons of grammar?

Having liquidated “man” as suffix (chairman, salesman, anchorman, and the like have been superseded by the appropriately prefixed “person”), feminists are now focusing on the masculine pronouns, “he,” “him,” and “his.” Such pronouns, they contend, should be used only when referring to men. If they refer to both men and women or if the gender of the referent is either unknown or not at issue, “he,” “him,” and “his” should be followed, respectively, by “or she,” “or her,” and “or hers.”

No one will dispute the logic of the feminist demand; however, logical demands are not necessarily reasonable. Many of those who have graciously accepted the constraints of “person”-ship, even at the expense of such tongue twisters as “sportsperson-ship,” balk at the “he or she” imperative. They either refuse to comply or let off steam through tongue-in-cheek articles and letters to the editor. Some suggested new coinages, such as “heshe,” “shehe,” or “ehshe,” to designate both genders. Others proposed, as an act of atonement for centuries of semantic discrimination, that the feminine pronoun be used when both genders are implied.

The “he or she” imperative weighs heavily on medical writers, whose concerns are with the physician and the patient, either one of whom can be male or female. Small wonder that their essays and editorials are showered with these awkward pronoun linkages to the point of saturation. Take, for example, the following passage:

To a diabetic patient with autonomic neuropathy, postural hypotension can be a source of frustration. He or she may not be able to cope with gravity. To his or her physician, this disability is a source of perplexity. He or she may find it difficult to explain why therapy is ineffective.

The writer who penned these clumsily awkward sentences might have secretly wished that he or she were a veterinarian. He or she could then have tagged his or her patient with the impersonal neutral “it” and thus spared himself or herself a stylistic embarrassment.

Is there no way out of this impasse? Must the semantic obstacle always impede the smooth flow of language?

One stratagem, which is now used with increasing frequency, is the plural umbrella. Mercifully, the English plural knows no gender. “They,” “theirs,” and “them” embrace both the masculine and the feminine, thus obviating the singular “he or she.” The plural umbrella would transform the aforequoted clumsy passage into an elegant:

To diabetic patients with autonomic neuropathy, postural hypotension can be a source of frustration. They may not be able to cope with gravity. To their physicians, this disability is a source of perplexity. They may find it difficult to explain why therapy is ineffective.

Of course, not every medical writer will be happy with the plural alternative. The odd one may miss the more vigorously personal singular “he.” Let him or her then seek other gimmicks. Where there is a will, he or she will find a way.

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