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EDITORIAL

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What's in a Name?

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Within the short span of a few years, minimally invasive cardiac surgery has caught the attention of cardiac surgeons, cardiologists and the public worldwide, and has become an important topic in every cardiac surgical meeting. "Minimizing the invasiveness" of heart operations generally implies reducing the trauma of conventional surgical techniques. Nevertheless, the most appropriate approach in achieving this goal, and what constitutes "minimal invasiveness" in cardiac surgery have so far remained poorly defined.

Many cardiac surgeons continue to regard extracorporeal circulation as the most important cause of patient morbidity, and believe that the avoidance of cardiopulmonary bypass is the most effective means for substantially reducing the morbidity of cardiac surgical operations. Indeed, a large body of evidence is already available to prove that "off-pump" coronary surgery is associated with enhanced postoperative recovery when compared with conventional surgery. Albeit contested, minimally invasive coronary grafting is largely considered synonymous with "off-pump" surgery, irrespective of the mode of access.

What defines minimally invasive techniques is even more contentious when intra-cardiac operations are considered, since the need for cardiopulmonary bypass in this setting cannot be waived. Would the use of alternatives to median sternotomy reduce the invasiveness of intra-cardiac operations? Trauma of access is well recognized in general thoracic surgery, so much so that minimizing invasiveness has become synonymous with minimizing access (i.e., using smaller incisions). Yet many cardiac surgeons still believe that the benefits of minimizing access trauma are very limited when cardiopulmonary bypass, with its potential morbidity, is used. Despite such substantial skepticism, trials using minimal-access approaches for heart valve operations are being performed; and experience to date certainly suggests that *some* of the proposed approaches are associated with less postoperative pain and faster patient recovery when compared with median sternotomy.

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The wave of enthusiasm which has accompanied these developments has led many authors to arbitrarily designate the wide range of new "off-pump" or "minimal-access" approaches to heart operations as minimally invasive, notwithstanding the variable methodology of these techniques and the general lack of supporting scientific evidence. A word of caution is certainly necessary here. It is crucial that such an appealing label is only thoughtfully put to use, because surely not all small incisions are less traumatic than larger ones. For instance, the excessive spreading of ribs, and intercostal nerve trauma, which may be necessary in order to achieve exposure through a small incision, could defeat the purpose of this approach. Furthermore, if surgery were to proceed very slowly because of the limited access, then the potential morbidity caused by an excessively prolonged extracorporeal circulation may heavily outweigh any pledge of benefits ascribed to reduction of chest wall trauma.

We propose here that minimally invasive cardiac surgery should *only* be defined by measures of clinical outcome in comparison with conventional techniques. We also acknowledge that this proposal presents two important points that deserve to be debated. Which indicators should be used to gauge "invasiveness"? Postoperative complications, pain levels, and the time taken for patients to assume normal activities or to return to work are the most straight forward to obtain and may provide valuable information. Nevertheless, these indicators are not necessarily easy to analyze. Pain is highly subjective and its evaluation is intricate. Hospital stay is frequently influenced by non-medical factors such as insurance coverage, and time of return to work is influenced by patient financial resources, motivation, and employer attitude.

There is little doubt also that randomized controlled trials will be necessary to evaluate new techniques according to any set criteria. The timing of such trials is crucial, and it is important to recognize that trials should not, and probably could not, be done during the evolutionary phase of such a procedure when skills, techniques, philosophies, and even surgical biases of the surgeons are constantly changing. Any of these factors can have a significant effect on the outcome. Before being subjected to trials, therefore, new procedures or techniques should be given adequate time to mature, for surgeons' skills to develop, and for dedicated instruments to be improved;

otherwise we run the risk of compromising the credibility of some very valuable new techniques.

The controversy of what constitutes "minimally invasive" cardiac surgery must be resolved, but our definition must rest on firm foundations. The individual study and timely comparison of each newly proposed approach with the conventional, together with documented clinical benefits will not only boost the credibility of the designation "minimally invasive", but will likely expedite the acceptance of newly developed valuable methodologies as new treatment modalities for heart disease.

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