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REFERENCE

1. Martin RW, Bashein G: Measurement of stroke volume with three-dimensional transesophageal ultrasonic scanning. ANESTHESIOLOGY 70:470–476, 1989

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In Reply:—Dr. Noel raises an important issue regarding our paper[1] and the future growth of TEE in anesthesiology.

We agree that labor intensiveness is the single greatest impediment to wider adoption of TEE as a clinical tool. Quantitative measurements on two-dimensional images take considerable time and may require additional personnel in order to derive results in a timely fashion. The bottleneck is the time required to outline the endocardial or epicardial borders manually using a joystick or other pointing device.

We briefly discuss progress in automatic border detection of transcutaneous images in our paper. However, a recent report by Bosch *et al.** is worth mentioning as they have developed a method that appears to perform reliably and accurately on transesophageal short axis images. Further, it executes within 30 s on a microcomputer that uses the Intel 80286 processor. How well it performs on a large data set is yet to be learned.

Dr. Noel correctly points out that image processing problems such as this lend themselves to use of parallel computers. These types of computing systems do have the potential for performing border detection on-line. As an example of how technology may progress in this area, we recall struggling in the early 1970s with the computers then available to perform simple ECG analyses. Today, commercial systems are being routinely used in Coronary Care Units to detect and analyze complex dysrhythmias in several patients simultaneously.

Our work in three-dimensional reconstruction has been undertaken in the belief that the border detection problem will be solved and come to fruition in the next several years. We therefore are investigating applications of three-dimensional cardiac reconstruction in animals and man, using tedious off-line processing while we look forward to the development of the necessary computer software and hardware to automate the process.

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* Bosch JG, Reiber JHC, van Burken G, Gerbrands JJ, Gussenhoven WJ, Bom N, Roelandt JRTC: Automated endocardial contour detection in short-axis 2-D echocardiograms; methodology and assessment of variability. Computers in Cardiology, IEEE 88CH2733–0, 1989 pp 137–140

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Acetylcholine Receptor Density and Acetylcholinesterase Enzyme Activity in Skeletal Muscle of Rats Following Thermal Injury

To the Editor:—The paper by Marathe *et al.*[1] tests the hypothesis that an increase in acetylcholine receptor (AChR) number explains the resistance to nondepolarizing muscle relaxants (NDMR) following thermal injury. The authors, however, find no increases in AChR number following thermal injury. Although these findings appear to contradict our previous reports[2,3] on AChR changes following burns, certain differences in the experimental preparation used need to be emphasized in order to avoid confusion among the readers.

Our model consisted of splenectomized rat with a total body surface area (TBSA) burn approximating 45–55%.[2] In this model, at 10, 14, and 21 days after burn, the burned animals lost weight compared to preburn weight, which was associated with significant increase in AChR number in the diaphragm. By 28 days, the size of the burn wound had decreased to approximately 19% TBSA, the body weight increased compared to preburn weight, and the AChR number had returned to control levels. In a more recent study,[3] using the same model of 45–55% TBSA burn, the gastrocnemius response to d-tubocurarine was evaluated and correlated to AChR changes. There was a 65–225% increase in AChR in the gastrocnemius at 10, 14, and 21 days after burn and the AChR number correlated significantly with increased effective dose for d-tubocurarine ($r^2 = 0.65$, $r = 0.81$). Another study in unsplenectomized mice examined the sensitivity of the gastrocnemius muscle to d-tubocurarine, at 21 days after a 20%, 30%, and 50% TBSA burn.[4] The effective dose of d-tubocurarine was unchanged in the