LETTERS TO THE EDITOR

Letters to the Editor will be published, if suitable, and as space permits. They should not exceed 1,000 words (typed double spaced) in length, and may be subject to editing or abridgment.

Strip Chart vs Polaroid Echocardiogram: Continued

To the Editor:

I feel that Dr. Greenwald’s strong comments published in May 1974 issue of Circulation directed to Dr. McLaurin’s paper of September 1973 are unjustified. Dr. Greenwald has done a disservice to the many excellent papers based on polaroid echocardiograms. While there is no doubt that strip chart records are preferable to polaroid echocardiograms, because of the ease with which echocardiography may be performed using strip chart, it should be pointed out that expensive equipment is no substitute for careful technique. The idea is to sector scan the heart, and it is entirely possible to do this with polaroid on a slow sweep. A strip chart recorder is as expensive as an echocardiograph itself. Not all hospitals are as lucky as Dr. Greenwald to afford $20,000 for echocardiography equipment with a strip chart. This is particularly true when a new service is being established in a community. I would reaffirm that gadgetry is no substitute for quality and experience.

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Subpulmonary Ventricular Septal Defect with Pulmonary Stenosis

To the Editor:

In a recent Clinicopathologic Correlation of this journal (Circulation 49: 173, 1974), Drs. Satyanarayana and Edwards cited two cases of subpulmonary ventricular septal defect with pulmonary stenosis (CSD + PS) as one of the conditions simulating the tetralogy of Fallot (ToF). They stated that this association was particularly uncommon. Contrary to this statement, CSD + PS is not rare in the Japanese congenital heart disease population, and constitutes a rather important part of “clinical ToF.”

During the last three years, intracardiac repairs have been performed on 279 cases of clinical ToF in the Heart Institute of Japan, of which 26 cases (9.3%) were CSD + PS. Similar figures were observed by other Japanese cardiovascular surgery teams.1,2

In 1000 autopsy series of congenital heart disease in our Institute, 109 cases (10.9%) were classical ToF and 22 cases were CSD + PS, of which 85% were surgical deaths.

Clinical features of CSD + PS are those of classical ToF. The right ventricular angiography establishes the diagnosis by demonstrating absent conal septum between the semilunar valves and very close approximation of the same valves. In young patients with this condition, withdrawal pressure tracings from the pulmonary artery to the right ventricle usually reveal those of valvular PS. The pulmonary artery trees of these cases are generally good for clinical ToF.

The morphology of CSD + PS is different from that of classical ToF. The conal septum is absent. Large ventricular septal defect (VSD) is subaortic as well as subpulmonary. The aortic valve considerably overrides the right ventricular cavity, because the right half of the right coronary cusp is upon the conal free wall of the right ventricular infundibulum. The rest of the right coronary cusp is just adjacent to the pulmonary cusp. The lower margin of the VSD is usually formed by a remnant of the membranous septum (total conus defect), and sometimes by a muscular ridge, which appears to be a remnant of the proximal conal septum (subtotal conus defect). The PS is due to a bicuspid stenotic valve with a small valve ring. In older cases, secondary hypertrophy of the infundibular free wall may contribute to PS. Embryogenesis of these cases appears to involve no development of the distal conal septum and anterior deviation of the proximal tricus septum (i.e., dextroposition of the aorta and a small pulmonary valve ring).

Before recognition of the morphology and morphogenesis, CSD + PS constituted a significant part of the surgical death of clinical ToF. However, with an improvement of the surgical relief of the PS, the death rate is decreasing.

Considering the prevalence of the subpulmonary VSD with dislocating aortic valve and aortic regurgitation in Japanese and probably in Chinese,3 we might speculate that the development of the conal septum in Orientals may differ from that of the Caucasian. This is to be clarified in the future.

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References

Quantitating Left-to-Right Shunts

To the Editor:

We read with interest the article by Anderson, Jones and Sabiston entitled, Quantitation of left-to-right cardiac shunts
with radionuclide angiography (Circulation 49: 512, 1974).

Its authors make reference to our recent article (Circulation 47: 1049, 1973), among others, as a method to successfully document the presence of left-to-right shunts. We would like to point out, however, that the method that we described not only can document the presence of left-to-right shunts but can also accurately estimate the pulmonary to systemic flow ratio. This method has been successfully applied to more than 300 patients and is being used clinically in our institution.

One question that we have regards the quality of the injection. The authors inject all their patients into an arm vein with a 19 gauge needle. In our experience it has been very difficult and sometimes impossible to inject through a 19 gauge needle in the antecubital vein of infants. In general, we found that about 10–15% of the peripheral injections resulted in a fragmented bolus and that in cases of Valsalva maneuver the bolus was also fragmented. What criteria were used to determine whether or not the injection was appropriate? Data were collected at one second intervals but when one inspects the curves they appear to have more than one inflection per second. Are these analog tracings?

We would also like to ask for more details on the method used to calculate the shunt. How is the peak estimated? In the example given (fig. 1B, fig. 3) it seems that the several points could have represented the peak and that the shunt ratio would have been different for each. Also, how is the exponential decay estimated? The number of points from the original curve used is critical for the determination of the exponential decay, the area under the curve and thus the shunt ratio. We look forward to hearing about the details of this new method for quantifying left-to-right shunts.

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The authors reply:

We were quite delighted that Dr. Treves and Dr. Maltz have asked these questions so that we can clarify our technique and point out an error in the manuscript.

The youngest patient that was included in our series was 22 months of age and fortunately in this age range we have not had a major difficulty in being able to introduce an appropriately sized needle. Then the child is allowed to stabilize after inserting the needle prior to injecting the bolus. If the angiogram demonstrated a descending portion which was well fitted by an exponential the injection was considered a success. Unfortunately, an error in the manuscript which was corrected in the galley proofs appeared again as in the original manuscript. The data were not collected at 1 sec intervals but at 0.1 sec intervals. We appreciated your recognizing this error. The curves that you examined in figure 1 were obtained after carrying out the procedures referenced in the Methods.

As you noted in figure 1B the point which was selected as the peak occurred just prior to the descending portion of the right lung angiogram. The initial wash out slope was then replotted semilogarithmically and as you can note in this figure the exponential curve that was obtained using this technique closely fits this descending portion of the curve prior to the distortion of the angiogram by either recirculation systemically or by central recirculation due to a left-to-right shunt. We certainly agree that a good effort should be made to fit this descending portion of the curve as closely as possible. It would be delightful if you would apply this method of deriving the left-to-right shunt from the right lung angiogram which you have obtained in order to see if it would be successful in handling what you consider to be fragmented curves.

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Coronary Ostial Stenosis

To the Editor:

I write to comment on the interesting article by J. E. Yates et al. (Circulation 49: 539, 1974) entitled Coronary ostial stenosis: A complication of aortic valve replacement. I think the title of this article would better read: "Coronary ostial stenosis: A complication of coronary artery perfusion." The complication that the authors have so nicely documented is related to the insertion and inflation of a semi-rigid tube with balloon catheter in the coronary ostia of patients undergoing aortic valve replacement. I submit that this complication is not a complication of aortic valve replacement per se, but of coronary artery cannulation and perfusion and should be so emphasized. The authors point out that one of their eight patients did not have coronary perfusion and yet developed an ostial lesion. Attempts to insert cannulae in this patient were unsuccessful because of a pre-existent ostial lesion. Slight trauma to an atherosclerotic obstruction may induce edema in the wall of that artery or an intimal injury which may lead to further coronary obstruction.

Clnics1,2 that employ the technique of local cardiac hypothermia for myocardial protection instead of coronary perfusion have not reported this complication following aortic valve replacement.

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References


The authors reply:

We appreciate the comments of Doctor Cohn. We agree that the most important factor in the development of this complication is coronary perfusion. This is not exclusively related to balloon catheters and has occurred with silastic cannulas. The observation that intimal thickening of the aortic root, with extension into the area of the coronary ostia, occurs in patients with prosthetic heart valves, suggests that this is not always a response to coronary perfusion. The coronary ostial narrowing in our patient without perfusion of the right coronary artery was probably of this type. In view of this case we believe that coronary ostial stenosis may
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