

RECENT ADVANCES IN CARDIOVASCULAR DISEASES

DONALD M. MAHANNA, M.D.,

Department of Medicine, The Ohio State University

In the field of congenital heart malformations, several recent advances in treatment have altered our approach to what was once considered a hopeless problem. Some years ago Gross first introduced surgical intervention in the treatment of a patent ductus arteriosus. This communication between the aorta and pulmonary arteries normally closes shortly after birth. The persistence of a patent duct seriously alters normal adult cardiovascular dynamics. Although some patients live a comfortable life, most of them develop subacute bacterial endocarditis or progressive congestive heart failure. Gross (1) conceived and perfected the surgical technique of ligating the patent ductus with a minimum of operative risk. Although the procedure is not always technically possible, the results in a great majority of patients are highly gratifying. The indications for surgery are subacute bacterial endocarditis or beginning cardiac embarrassment.

Within the past two years Blalock and Taussig (2) conceived the idea that perhaps an arterial shunt could be created to circumvent a congenital stenosis of the pulmonary artery or valve. The children suffering from this lesion are pitiable creatures, with their intense cyanosis, severe dyspnea and clubbed fingers. The technique, after careful experimental studies, was finally carried out in children with an otherwise hopeless prognosis. It consisted of anastomosis of a large arterial branch of the aorta to the pulmonary artery or one of its main branches beyond the point of stenosis. Preliminary reports are very encouraging.

Gross and Hufnagel (3) have reported resection of the area of atresia for correction of coarctation of the aorta. This procedure involves much more difficult surgery and there is no series of cases to present as a basis for discussion. But the ice has definitely been broken and much more accurate differential diagnosis of congenital heart lesions is desirable in order to uncover those that might now or in the future be amenable to surgery.

There have been several recent advances in the field of acute rheumatic fever and rheumatic heart disease. Most reports indicate a favorable response in the prevention of acute rheumatic fever by small daily doses of Sulfadiazine. An average of 0.5 to 1.0 grams daily is considered as adequate dose. Toxic reactions are few but the blood count should be followed at frequent intervals. There is some question concerning the development of sulfa-resistant strains of streptococci; this problem has not been settled. However, we do know that sulfa drugs are contraindicated during or within three months after an attack of acute rheumatic fever. The possibility of applying the same principle to the use of oral penicillin offers hope in the future of perhaps several agents to reduce the acute recurrence of this disease.

Coburn (4) has re-opened the question of the therapeutic value of salicylates in the treatment of the acute stage of rheumatic fever. He has recently treated a series of cases with massive doses of salicylates and is convinced that cardiac involvement is lessened and the duration of the acute stage shortened. This also re-opens the question of the fundamental effect of salicylates on antigen-antibody reactions in the body and, hence, on the prophylactic as well as therapeutic effect of salicylates on the hypersensitive rheumatic fever patient. There is not general agreement on this subject but the prospect of a more favorable course of the acute disease appears to be worthy of close scrutiny.

The past two years have seen the only real advance in the treatment of subacute bacterial endocarditis. Before the use of penicillin, I had never seen even one patient recover from this disease but in the past two years have indicated

recovery in 25 to 75 per cent (5). The dosage of penicillin necessary, the methods of administration and the length of treatment have been pretty well worked out. Three hundred thousand to one million units daily by continuous intravenous or intrasternal route for a period of six weeks seems at this time to be the most satisfactory regimen. The most important points to be remembered are: 1, the earlier the diagnosis is made the better the prognosis; 2, the daily dose should be optimum rather than minimum; 3, treatment should be continued for several weeks after negative blood cultures have been obtained, and 4, anticoagulants are of no value in the therapy and are in fact definitely contraindicated.

The prevention of subacute bacterial endocarditis following nasal and oral surgery and extraction of teeth in known rheumatics is an equally great stride in therapeutics. Perhaps it would be proper to say that it is more important than treatment of the disease. Sulfadiazine 1 gm. every four hours for twenty-four hours before and forty-eight hours after such procedures is the present method of choice. It should be routine practice to stress to all our known rheumatics the dangers involved and the importance of proper prophylaxis even though the extraction of a tooth may seem a trivial procedure. Perhaps in the future oral penicillin will supplant sulfa drugs.

In spite of intense study of the causes and treatment of hypertension by many investigators, there is little for me to report. The status of medical treatment has changed but little. Surgical treatment by sympathectomy has been the subject of much controversy; some patients so operated have seemed to respond nicely whereas others presenting a nearly similar clinical picture have not. In the past the cold pressor test, the pentothal anaesthesia test and spinal anaesthesia test have been used singly or in combination in an attempt to select for surgery those cases which might, on the basis of the results of the tests, be expected to show optimum improvement. Postoperative results have not been uniform. Russek, Southworth and Zohman (6) recently reported a new procedure for the prediction of a favorable or unfavorable response to sympathectomy. Their method employs the use of continuous caudal anaesthesia which may be maintained at any segmented level. The results of blood pressure determinations during anaesthesia are reported as a reliable index of the response to surgery in approximately 90 per cent of cases.

Wright (7) reported recently of a neurovascular syndrome due to hyperabduction of the upper extremity. He found changes in the pulse in approximately 84 per cent of normal young males when the upper extremity was placed in this position. Some of these complained of numbness, tingling and pain when the arm was maintained in this position for even short periods of time. Wright felt that most persons would return the arms to normal position even during sleep but he reported several cases which had severe day-long disability due to continued maintenance of hyperabduction during sleep. One of his cases had tropic changes in the finger tips because of prolonged interference with circulation. The etiology is distinct from the scalenus anticus syndrome and results from the pinching of the subclavian artery and brachial plexus between the first rib, pectoralis muscle and clavicle when the upper arm is hyperabducted.

In the treatment of congestive heart failure, I feel there has been a recent very outstanding advance, one which will help to clear up some of the confusion about variation of potency of various digitalis preparations. Crystalline Digitoxin is available in tablet and ampule form under various trade names. In contrast to oral digitalis leaf this preparation is completely absorbed in the G-I tract and 100 per cent of the drug administered is utilized; it causes very few undesirable symptoms such as malaise, anorexia, nausea and vomiting. Massive single-dose oral or intravenous digitalization can be easily accomplished as a routine measure with great safety. The dose is 1.2 mgm. to 1.6 mgm. or six to eight tablets; maintenance dose is 0.1 mgm. or 0.2 mgm. or one-half to one tablet. In my experience it is tolerated by elderly patients much better than digitalis leaf.

It is probably the best product for routine use because of ease of dose calculation, ease of administration and better tolerance.

BIBLIOGRAPHY

1. **Gross, R. E.** Complete surgical division of the patent ductus arteriosus; report of fourteen successful cases. *Surg., Gynec., and Obst.*, 1944, No. 6.
2. **Blalock, A., and Taussig, H. B.** The surgical treatment of malformation of the heart in which there is pulmonary stenosis or pulmonary atresia. *Jr. Am. Med. Assoc.*, 1945, cxxviii, 189.
3. **Gross, R. E., and Hufnagel, C. A.** Coarctation of the aorta. *New England Jr. Med.*, 1945, cxxxiii, 287.
4. **Coburn, A. F.** The factor of infection in the rheumatic state. 1931. *The Williams and Wilkins Co., Baltimore*, p. 122.
5. **Hatfield, S. A., Mahanna, D. L., and Fertman, M. H.** Penicillin therapy in subacute bacterial endocarditis. *O.S.U. Med. Jr.*, Vol. 41, 1945, No. 6.
6. **Russek, H. K., Southworth, J. L., and Zohman, L. B.** Selection of Hypertensive patients for sympathectomy. *J.A.M.A.*, Vol. 130, No. 14.
7. **Wright, Colonel I. S.** The neurovascular syndrome produced by hyperabduction of the arms. *Am. Heart Jr.*, 1945, Vol. 29, No. 1.