

EDITORIAL

CORONARY ARTERIOGRAPHY

Selective coronary arteriography, first introduced by Sones in 1962, is now an established investigative procedure in most cardiac laboratories. Its introduction has increased our understanding of coronary artery disease and its natural history. The morphology of the coronary arteries and blood flow in these arteries can now be visualised in the living subject. This is a prerequisite in coronary artery surgery which is increasingly employed in certain categories of patients with ischaemic heart disease. In 1975, selective coronary arteriography was performed for the first time in Singapore. This step is a natural response to the rising incidence of coronary artery disease in Singapore and the corresponding increase in the number of patients who require treatment by coronary artery surgery.

There are two well established techniques for selective coronary arteriography. In the Sones technique, the right brachial artery is exposed through a cut down over the antecubital fossa and a single catheter is used to cannulate the left and right coronary arteries respectively. A different catheter is used to perform left ventriculography. The right brachial artery is repaired at the end of the procedure.

The other technique was developed by Judkins (1968) and is the more widely used of the two because of its relative simplicity. Specially preshaped catheters are introduced percutaneously through the right femoral artery with the help of guidewires, into the abdominal aorta. Three different catheters are used; one for the right coronary artery, one for the left and one for left ventriculography.

Between 4 to 10 ml of contrast medium is injected by hand into the coronary arteries after they have been selectively cannulated. These injections are done with the patient positioned in varying degrees of right and left obliquity, so that the coronary arteries can be visualised at various angles. X-ray pictures of the coronary arteries are recorded on cine film. A left ventriculogram, done either before or after coronary arteriography, provides assessment of left ventricular function and helps to detect localised areas of diminished movement or aneurysm.

Coronary arteriography is indicated in the following circumstances: (1) for the firm diagnosis of coronary artery disease in patients with chest pain, (2) in assessing suitability of patients for coronary bypass surgery, (3) in patients requiring surgical treatment for the complications of myocardial infarction e.g. perforation of the ventricular septum and ruptured papillary muscle of the left ventricle, and (4) in patients over 40 years of age with severe aortic stenosis in whom co-existent coronary artery disease is suspected.

Although the diagnosis of angina can be made clinically from the history and electrocardiogram in the great majority of cases, a small number do require confirmation with coronary arteriography. It is well known that the resting ECG is normal in 50% of patients with angina and the exercise ECG yields false negative results in 30%. Furthermore, it has been found that up to 30% of patients with chest pain suggestive of ischaemic heart disease have normal coronary arteries (Proudfit, 1966). Sones and Judkins have gone so far as to advocate that coronary arteriography is indicated whenever coronary artery disease is diagnosed clinically or suspected. They argue that besides being essential for selection of patients for surgery, it allows a more certain prognosis to be made, based on angiographic data. This is an extreme approach and, costs aside, it is unlikely to be widely adopted. Coronary arteriography carries with it varying incidences of morbidity and mortality in different centres, depending on the expertise of the operator and his team (Judkins, 1974). Thromboembolic complications are well-known. Ventricular fibrillation, acute myocardial infarction and coronary artery dissection can occur during or after the procedure. Adams (1973) has shown that the complication rate was inversely related to the number of cases done in any one laboratory. The Cardiology Committee of the Royal College of Physicians in U.K. (Emmanual, 1975) suggested that the number of coronary arteriography should be at least 100 cases per year to achieve laboratory competence. However, Shah (1975) reported that despite performing less than 100 such examinations a year, complication rate

was no greater than that reported by centres who perform more than 200 examinations per year.

The best results from saphenous vein bypass surgery are obtained in patients with severe and stable angina pain who have not responded to adequate medical treatment and whose usual daily activities are consequently curtailed. Saphenous vein bypass grafting has been performed in patients with unstable angina and in the early phase of acute myocardial infarction. The results of such emergency procedures are currently being evaluated.

In competent hands, coronary arteriography is a relatively safe laboratory procedure. Used discriminately in conjunction with surgery, it constitutes an important gain in the management of atherosclerotic coronary artery disease.

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