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curring after conversion (27 episodes), atrial extrasystoles six times (22 per cent), atrioventricular nodal extrasystoles or escapes six times (22 per cent); atrial flutter or tachycardia three times (11 per cent); atrial fibrillation once (3.7 per cent); and atrioventricular nodal tachycardia once (3.7 per cent).

References

The Pulse Rate

Although the ancient Egyptians, according to the Ebers papyrus (1600 B.C.), paid attention to the pulse, and the Chinese in the fifth century B.C. attached great importance to the characters of the pulse, of which they recognized three thousand varieties, and Herophilus (300 B.C.) of Alexandria counted the pulse with his water clock or clepsydra, its rate apart from its other characters did not attract any general interest in Europe until long after Harvey's time.—Sir HUMPHRY DAVY ROLLESTON. The Harveian Oration. Great Britain, Cambridge University Press, 1928, p. 81.
NOREPINEPHRINE AND CORONARY CIRCULATION

The Scientific Method

The guarantee of science is in the verification of experience, direct or indirect. It distrusts the validity of a priori conclusions, or of any explanation drawn solely from general ideas of Nature's order, unless those general ideas have themselves been rigorously demonstrated to be necessities of thought, or to represent the observed order. What must be, or may be, has to give place to what is. The general doctrines of Science are never, like those of Theology and Metaphysics, conceived to be final.—GEORGE HENRY LEWES, Aristotle: a Chapter from the History of Science (Smith, Elder and Co., London, 1864).

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years, no data have been presented to determine whether the basal state is disturbed by atrial septal puncture. Since it is generally agreed that interpretation of the meaning of an atrioventricular valve diastolic or semilunar valve systolic pressure gradient depends in part upon the blood flow across the valve, the data in the present study bolster confidence in the validity of pressure and flow measurements obtained after transseptal left atrial puncture. Unlike the hemodynamic observations after posterior percutaneous left atrial puncture (which required a period of 30 to 40 minutes to permit achievement of a steady state), and unlike the measurements made after transbronchial left atrial puncture (which require removal of the bronchoscope to permit development of a steady state), steady state pressure and flow measurements may be made within 5 minutes after transseptal puncture. Various physiologic observations may therefore readily be performed after transseptal left heart catheterization.

Summary

Comparisons of cardiac index, mean transit time, and “pulmonary” blood volume were made with indocyanine green dilution curves before and after transseptal left atrial puncture in 105 patients in sinus rhythm and 52 with atrial fibrillation. The results demonstrated that the steady state was not disturbed by transseptal left heart catheterization.

References


Medicine—A Profession and a Social Institution

From the point of view of an individual, medicine is a profession—perhaps “his” profession. From the vantage point of society, medicine is a social institution performing a truly important function in our civilization. By going into medicine one commits himself to carry forward the function or commitment of the profession with respect to society. I say “carry forward” because medicine would not have been accepted generation after generation by a changing society if its central tradition were a static one. It has not only survived but grown in stature because its commitment is to change—to the untiring quest for more effective ways to preserve health by the elimination of disease, and for more humane and effective methods to care for the sick and the suffering. Only as the profession restlessly seeks to unburden society of the need for the very function it performs does medicine truly meet its commitment.—Introduction, Edward D. Churchill, M.D. Listen to Leaders in Medicine. Edited by Albert Love and James Saxon Childers. Atlanta, Tupper and Love, Inc., 1963, p. 3.


Sphygmomanometry

The history of blood pressure really begins with Stephen Hales (1677-1761), minister of Teddington, who with a sound training in Newtonian physics applied this knowledge to biology and physiology. Before 1723 he tied tubes into the arteries and veins of animals and estimated the pressure in the capillaries, thus being far in advance of his time. In a mare he found that the blood pressure was equal to a column of blood of eight to nine feet. Nearly a century passed before the subject was further investigated, and then Poiseuille (1828) employed a U-shaped mercurial manometer (haemodynometer) which, as van Leersum points out, was but a step from the mercurial column used by Hales to estimate the pressure of the sap in a pruned vine. To this, in 1847, Carl Ludwig added a float with a pen to record the variations of the blood pressure on a revolving cylinder (kymograph).

The clinical estimation of blood pressure by instrumental means was first attempted by Vierordt in 1855 by measuring the weight necessary to stop the arterial pulsation; but von Basch in 1880 invented a sphygmomanometer on this principle which was applied locally over an artery and was widely used.

The present sphygmomanometric methods became generally available as a result of Riva-Rocci's modification of von Basch's instrument with a piece of rubber tubing to surround the arm in 1897, and by Hill and Barnard's independent description of a somewhat similar instrument in the same year.—Sir Humphry Davy Rolleston. The Harveian Oration. Great Britain, Cambridge University Press, 1928, p. 101.
but also over the upper sternum and neck. A prolonged high-pitched decrescendo murmur radiated down the left sternal border and was best heard at both second interspaces. In the left interscapular area a systolic murmur, radiating over the posterior chest, was also heard. Blood pressures were as follows: right arm, 140/60-40; left arm, 130/60-40; and left leg, 160/50 mm Hg. The phonocardiogram showed a diamond-shaped mid-diastolic murmur at the second right and left interspaces and apex, where an early ejection sound was present. \( S_2 \) was 0.6 second wide and varied little with respiration. A high-frequency diastolic murmur filled diastole. The electrocardiogram showed markedly increased amplitude of \( S_4 \) and \( RV_5 \) suggesting left ventricular hypertrophy.

The roentgenogram of the chest showed slight prominence of the left ventricle. Percutaneous right axillary aortography on December 17, 1963, disclosed aneurysmal dilatation of the two aortic sinuses, bicuspid aortic valves, and moderate aortic insufficiency. Although narrowed, the aorta below the left subclavian artery at the site of the previous coarctation was patent; pressure gradients were not found between the left ventricle and ascending aorta and between the aortic arch and descending aorta (fig. 2 A, B, and C). The patient was discharged on December 21, 1963, following these studies; further surgical treatment did not seem warranted at this time.

**References**


**Principles of Medical Sciences**

Experiment in man, or direct experiment, limited in possibilities of application as it necessarily must be, is the one wholly unexceptionable method available for the solution of problems of human health and disease. Though its history is still very short, it has already proved remarkably fruitful. There can be no doubt that one of the chief duties before medicine at present is the exploitation of the method of direct experiment. The natural history of sciences, however, seems to indicate that a diet of pure experimentation in a limited field is not enough for permanent scientific health. If experimental medicine is to progress healthily it must have a full supply of ideas, and must know how to deal with them. Such a purpose can best be served by a close contact with the realities of clinical medicine.—The Collected Papers of Wilfred Trotter, F.R.S. London, Oxford University Press, 1946, p. 126.
was also occluded. Microscopic study of the abdominal aorta disclosed marked thickening of the intima, subintimal fibrosis, and marked luminal occlusion by calcified plaques (fig. 6). Separation of the muscularis coat by hemorrhage filled two thirds of the circumference of the aorta. Cholesterol clefts and frayed intima were prominent. The common iliac arteries showed marked increase in the subintimal fibrosis, which filled three quarters of the lumen. Hemorrhage and dissecting hematoma of the muscularis layer were evident (fig. 6).

References


William Harvey—The Teacher

Harvey gave complete satisfaction in the performance of his duties at St. Bartholomew's hospital. In 1613 he was elected censor, which meant that with three other persons he decided who should be granted permission to practice medicine in London and its environs. By the time he was 35 he was elected fellow of the College of Physicians, and he grew every year in his colleagues' estimation. He was called upon to occupy a property consisting of two houses and a garden adjoining the hospital so he could be closer to his work. Two years later he embarked upon his lectures on surgery and anatomy as full professor.

The lectures took place in accordance with strict ritual. The attendant greeted the arrivals according to their rank, accompanied by phrases such as "... be pleased to attend ...", or "Our Masters desire your company in your gown and flat cap ...".

Harvey had to stand beside the body in his doctor's cap, white linen apron and white cotton gloves, of which there were several clean pairs on hand in case of soiling. He gestured with animation and pointed to the part in question with a small rod made of whale bone with a silver handle, while his assistant, also a physician, performed the necessary tasks...

He was confused by all the contradictory theories, which often seemed so lacking of any proof. Some said that murky vapors left the body through the pores of the skin. But he had never seen any such thing. Another thing he found odd was the assertion that blood takes on air through the pores of the skin. But what if a person is immersed in water? How would the skin be able to take on air then?

And again, how strange was the assertion that when the arteries enlarged rhythmically with each pulse beat, this took place by their own action. But if this were so, then the arteries should suck in, unlike what one saw when one opened an artery—which showed that the artery did not suck in but pressed out: in other words, that the blood is expelled from within. Such expulsion, however, could only take place if during the period of rhythmical dilatation the wall of the artery is enlarged as a result of an increase of the pressure inside the artery, the pressure deriving from quite far from the heart.—Tibor Dovy, M.D. Discoverers of Blood Circulation. From Aristotle to the Times of Da Vinci and Harvey. New York, Abelard-Schuman, 1963, p. 192.
handlung der Embolie der Lungenarterie.

Lord Joseph Lister (1827-1912) and Animal Vivisection

My own first investigations of any importance were a study of the process of inflammation in the transparent web of the frog's foot. The experiments were very numerous and were performed at all hours of the day in my own house. I was then a young unknown practitioner; and if the present law had been in existence, it might have been difficult for me to obtain the requisite licenses; and even if I had got them, it would have been impossible for me to have gone to a public laboratory to work. Yet without these early researches, which the existing law would have prevented, I could not have found my way among the perplexing difficulties which beset me in developing the antiseptic system of treatment in Surgery.

In the course of my antiseptic work at a later period I frequently had recourse to experiments on animals. One of these occurred to me which yielded particularly valuable results, but which I certainly should not have done if the present law had been in force. It had reference to the behaviour of a thread composed of animal tissue applied antiseptically for tying an arterial trunk. I had prepared a ligature of such material at a house where I was spending a few days at a distance from home; and it occurred to me to test it upon the carotid artery of a calf. Acting on the spur of the moment, I procured the needful animal at a neighbouring market; a lay friend gave chloroform and another assisted at the operation. Four weeks later the calf was killed and its neck was sent to me. On my dissecting it, the beautiful truth was revealed that the dead material of the thread, instead of being thrown off by suppuration, had been replaced under the new aseptic conditions, by a firm ring of living fibrous tissue, the old dangers of such an operation being completely obviated.—Lister.
Marcello Malpighi and the Spiral Bundles of the Heart

Malpighi gave considerable thought to the movements of the heart. Although Harvey had described these fairly exactly, it would still have been interesting to know the position of the various muscles and bundles of fibers. If the fresh heart, tough and elastic, was pulled and stretched, it eventually tore as a result of such treatment and the muscle fibers were broken. Thus it was impossible to get an idea of the construction of the whole heart’s muscle fibers.

Malpighi boiled the heart until it became quite soft. The fibers then separated at the least touch, they could be pulled apart with the fingers, as if untwisting thread. By this simple means he made an interesting discovery. Although the muscle of the heart appeared to be composed of three kinds of fibers, vertical, horizontal and oblique, these were all connected to each other, and it was their spiral arrangement which caused the error in identification.—Tibor Doby, M.D. Discoverers of Blood Circulation. From Aristotle to the Times of Da Vinci and Harvey. New York, Abelard-Schuman, 1963, p. 225.

Caleb Hillier Parry on Medical Knowledge

The most dangerous state incidental to the human mind is a calm acquiescence in the accuracy and extent of its own attainments. Knowledge is at once the origin of morals and the road to happiness; and precisely in proportion as we acquire it, we advance, though still at the most humble distance, towards the perfection of the Divine nature...

With this view, he who would aspire to a just character for professional eminence, ought to have an adequate knowledge of the properties of number and figure; of the laws of mechanics and hydraulics; of the general principles of botany and chemistry; and a still more minute acquaintance with the anatomy of man and other animals, and with metaphysics, or the properties of mind.

These acquisitions, necessary and multifarious as they are, can still be considered as only the introduction to the more immediate knowledge of his profession; in which he must, as far as possible, learn the structure and uses of the different parts of the animal machine, their various dependencies on each other, their movements and affections in a state of health, and the symptoms of deviation from that state. On these important subjects it would greatly improve the accuracy of his conceptions, were he to compare all the phenomena which occur in the human race with those of other animals, and even of the vegetable kingdom itself. He must also inform himself of the powers which disturb and restore the healthy functions, whether of the body or mind.—Preface. Collections from the Unpublished Medical Writings of the Late Caleb Hillier Parry, M.D.F.R.S. Vol. I., London, Underwoods, Fleet-Street, 1825.