



Heart: A History. Sandeep Jauhar. Penguin Viking, India. 2018. 288 pages. Price: Rs 599.

‘He must have had bee pea’, my friend declared. ‘What is *bee pea*?’ was my confused reaction. This friend is my high school classmate and is running a shop in my small home town after he dropped out from the school. This conversation took place many decades ago when I visited him and we were discussing about a common acquaintance who had died a few months ago. ‘It is blood pressure, if one has it he is certain to die of heart attack. And since this death was sudden it has to be heart attack’, my friend gave his verdict. He seemed to me quite up-to-date. However, if we read the present book by Jauhar we see what is wrong with my friend’s logic. More importantly how much we have progressed but still how difficult it is to arrive at correct conclusions.

Jauhar in this book makes it clear that high blood pressure is only one of the indicators for heart problems. There are many heart problems and many supposed indicators. We are bound to discover a few more in the future. He narrates how the famous ‘Framingham Heart Study’ done in the 1950s in a small town called Framingham in the US identified some of these indicators. Jauhar pictures vividly the mood and fear of heart attacks in the US at that time and how the sudden death of the American president by stroke also contributed to undertake this study. He summarizes how it was done and what were its findings, very briefly but self-contained and without jargon. It is this quality of the author that has enabled him to pack so many stories in his book of only 269 pages.

Jauhar is a cardiologist in New York and is the author of three bestseller books. He narrates with courage and sensitivity many of the roles he played: A high school student, a medical student, a medical intern, a doctor, a father and a heart patient. There are references to the idiosyncrasies of teachers and doctors and to racism. His work is scholarly giving the details, but just enough, to help us appreciate how we progress. He supports his brief narrations with a liberal list of supplementary reading material. Heart is at the heart of human health. But what we take for granted today regarding our knowledge of the heart is known only recently. And many researchers have taken risks. The heart was a sacred organ, beyond the reach of doctors and surgeons. It was not known why it is there at all. Only poets and philosophers may deal with it. But today we know it is about plumbing. Surgeons have put a tube in it, meddled with it to understand it or repair it, replaced its valves with mechanical or pig’s valves and finally replaced it altogether with a man-made device. All this is explained here without expecting readers to know a lot of anatomy or fluid mechanics. This is the success of the author.

In the entire book supposed to be on heart there is no detailed description of the ECGs or the familiar pictures of all the events in the heart during one cardiac cycle. Jauhar cuts short this temptation and straight comes to the heart of the matter. He has an eye for the logical development of understanding of the heart.

Jauhar narrates why Galen who was the physician of a Roman emperor and applied rudimentary scientific methods rooted in observation and animal dissection was a towering figure in Western medicine from the third to the seventeenth century. In his scheme the liver converts food into blood and in the left ventricle of the heart ‘vital spirits’ are added and heat is generated like in a furnace to pump blood through the fleshy body. We clearly see the difficulties of the times. But then a great push to the understanding of the heart came due to the Renaissance and its commitment to investigation and reason and consequent work of Leonardo da Vinci (1452–1519). He dissected pigs, oxen and human cadavers. He even constructed glass models of the aorta and aortic valve to investigate the flow. However, the con-

cept of continuous blood circulation still eluded him.

Finally it was William Harvey who discovered the mechanism of circulation in 1615. He did experiments on the slow beating hearts of fish and frogs. In a simple but ingenious experiment tying a cloth tourniquet to a human arm, Harvey inferred that blood drained from artery through invisible connections to the veins before returning to the heart. We call these invisible connections as capillaries today. By simple calculations he estimated that liver has to convert 500 pounds of food into blood every hour if blood were the nourishment to the body. He wrote that ‘the pumped blood passes through the lungs and also it returns to the heart, the inner temple of the body, to recover its virtue’. More importantly why is it pumped and what is that virtue? Jauhar reminds us that Harvey could not have inferred since the existence of oxygen was not known yet. That discovery was a century later. Also, Harvey waited 13 years before publishing his results. He feared for his safety; challenging Galenic dogma was considered sacrilegious. It is this kind of simple connectivity and details Jauhar provides that contribute to insight and pleasant reading.

Some of the chapters in the book have titles like Clutch, Dynamo, Pump, Pipes, Nut. The chapter Nut contains very interesting experiments made by dare devil doctors on animals, humans and the most kooky of it all, on themselves. It is scary but comical. A German surgical intern named Forssmann created history in 1929 by inserting a catheter first time into a human heart. And it was his own. Forssmann conspired with a nurse to perform an experiment on her that would change the course of medicine. In the operating room he tied her to a surgical table and immobilized her arm. When she was waiting for the operation on herself he turned around, prepared his left arm, sliced open the skin over his elbow crease, pulled a vein and inserted a 65-centimetre catheter through a hole. He released the angry nurse and asked her to follow him to the fluoroscopy lab downstairs. Lying down in the lab under the camera he pushed the catheter in till it entered the right atrium. If you think his attempt was chilling, imagine yourself attending a lecture by Charles Dotter in the early 1960s. In the middle of the lecture he rolled up his shirtsleeve to reveal that he had placed a catheter in his own

heart and then he connected himself to an oscilloscope to measure cardiac pressures. We owe to all these tinkerers and nuts for our current understanding of the heart.

The development of the heart–lung machine was conceived by John Gibbon, a Philadelphia surgeon in 1930 but it took almost 25 years to develop. Slow progress was due to the depression, World War II and also due to cultural inhibition. How could a man-made machine replace the organ that houses the soul? Then we read about surgical hypothermia which was tried in the early 1950s on dogs, monkeys and subsequently on humans. It takes advantage of the fact that metabolic activities come down with the temperature and even the brain can survive without permanent damage for a few minutes without any oxygen supply. Heart is stopped to facilitate the operation on itself. This time window was slightly extended by another daring if not bizarre attempt by Lillehei using the cross-circulation method inspired by the circulation of blood between mother and foetus. After years of practice on

some 200 dogs the first such attempt was in 1954 on a thirteen-month-old boy. His father was the donor whose heart and lungs were connected through rubber hoses and a milk pump to his son’s cardiovascular system. It was a controversial procedure risking another person. The success of the heart–lung machine around this time brought the curtain down for the hypothermia and the cross-circulation methods.

The book continues logically to the heart transplants, artificial heart, implantable pacemakers, external and implantable defibrillators, life saving medicines, etc.

Some of the cardiovascular risk factors are likely to be in the ‘psychosocial’ domain, an area which is difficult to handle. The book introduces us to a study which tells us about ‘chronic arousal’, or ‘stress’ with hypertension being a normal response. The studies on American black population and immigrant Japanese populations lead to surprising results and should bust some popular myths relating a single convenient indicator to every heart disease.

In 1959, a study showed that Indian males had four times the rate of premature heart disease compared to the American men surveyed in the Framingham Heart Study, despite having lower rates of hypertension, smoking, and high cholesterol and more often consuming a vegetarian diet. Today in South Asia, a large percentage of heart attacks occur in men with zero or only one Framingham risk factor. South Asians will soon make up over half of the world’s cardiac patients. We need a Framingham-type of study to understand the role of South Asian genetics and environment.

It is interesting to know that historically there was a general resentment towards any medical meddling with the heart. We have come a long way. Jauhar holds our hand and walks us through with humour and surprises at every stage.

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