1955: Opening the era of heart bypass surgery

Following World War II, patients faced an agonizing situation: Doctors were increasingly able to diagnose problems inside the heart, but surgeons could not fix them. For an operation to be successful, the heart would need to cease beating during surgery and the flow of blood through the heart and lungs would need to stop – conditions that no patient could survive.

Since the 1930s, doctors had pondered the idea of a mechanical device that would take over the role of the heart in pumping blood and the lungs in enriching the blood with oxygen.

Philadelphia surgeon Dr. John H. Gibbon collaborated with IBM to develop such a machine and used it to perform one successful operation in 1953. When three of his first four patients died, however, he decided to stop doing open-heart surgery.

While other methods of heart surgery were being investigated at various medical centers, Mayo Clinic specialists believed that Dr. Gibbon's concept had merit. Mayo representatives visited Dr. Gibbon, who described the construction and operation of his apparatus. Upon request from Dr. Gibbon, IBM provided Mayo with the blueprints for the heart-lung machine and instructions for operating it.

Mechanical modifications lead to successful surgery

A Mayo team including physicians, surgeons, physiologists and engineers went to work adapting the device – which became internationally acclaimed as the Mayo-Gibbon heart-lung bypass machine.

Bypassing the patient's natural heart and lungs to circulate blood and exchange air outside of the body, the Mayo-Gibbon heart-lung machine stabilized patients in ways previous methods had not achieved.

This steady support enabled Mayo Clinic cardiac surgeon Dr. John Kirklin and team to become the first to perform a successful series of open-heart surgeries, thus saving lives by means never before possible.

On March 22, 1955, Dr. Kirklin performed the first open-heart operation at Rochester Methodist Hospital, affiliated with Mayo Clinic. The Mayo-Gibbon heart-lung machine took over cardiorespiratory function while the surgical team closed a heart defect in Linda Stout, a 5-year-old girl from North Dakota.

"I realize Mayo took a chance with me as their first patient," she later recalled. "If I had one thing to say, it would be thank you for taking that chance."

Linda Stout was the first in a series of patients who benefitted from the new approach to surgery. Mayo Clinic showed not only that the heart-lung machine was effective, but also that its results could be replicated for many patients. As a result, Mayo Clinic transformed cardiac surgery by keeping patients alive during long, complex operations.

Building upon this experience, Mayo Clinic became a key contributor in cardiac surgery, research and education, paving the way for broad acceptance of this new form of treatment.

SOURCES

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