Angiography, Cerebral Encyclopedia Article

Angiography, Cerebral

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The discovery of X-rays by Wilhelm Röntgen in 1895 revolutionized most fields of science, the field of medicine included. The fact that some parts of the body are more dense than others means that X-rays can be used to diagnose some medical problems. Bone fractures, for example, are easily examined using X-ray photographs.

This generalization is not true, however, for studies of the brain, whose density is essentially constant in all its parts. In an attempt to apply the new methodologies of X-ray analysis to the brain, Walter E. Dandy (1886-1946) developed a technique for injecting air into brain cavities. The lower density of air made it possible to use X-rays to study normal and abnormal brains. The method was not very effective, however, and often involved considerable risk to the patient.

In 1927, the Portuguese neurologist, Antonio Egas Moniz suggested another solution for this problem. He injected solutions that are opaque to X-rays into the brain's arteries. Blood vessels in the brain then become clearly visible in X-ray photographs. These photographs can be compared with photographs of the normal brain to see where tumors might have displaced blood vessels.

Over the next decade, Egas Moniz and his colleagues published more than 200 papers describing their technique and the results they obtained with it. The technique, known as cerebral angiography, continues to be one of the most valuable methods for studying and diagnosing brain disorders, including detecting aneurysms (sacs in the vessel wall that can burst), blood clots, narrowing or blockage of the arteries, and changes in tumors.