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# First Resection of Coarctation of Aorta

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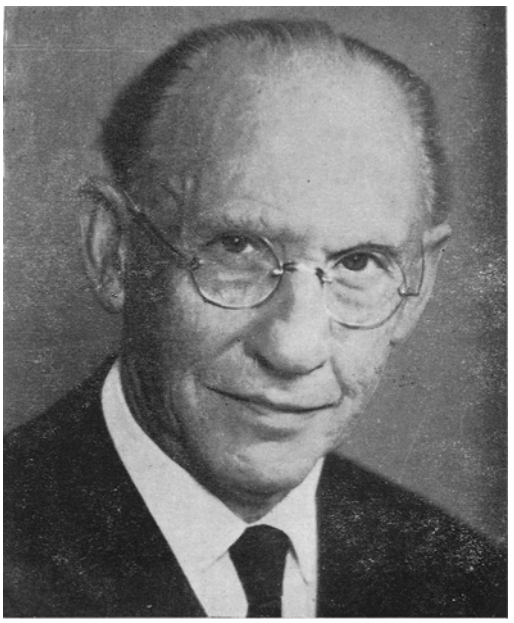
KEY WORDS: *Aortic Coarctation; Surgery: History.*



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## HISTORY

This is a brief retrospective report of the sequence of events that led to my decision to perform radical repair of coarctation of the aorta.

## BACKGROUND

Methods were gradually developed whereby the patient's spontaneous breathing could be taken over by artificial volume or pressure controlled respiration within normal respiratory - physiological limits, under simultaneous general anaesthesia, through airtight connections to the trachea. Conditions were then created for wide open unilateral and bilateral intrathoracic operations more or less without a time limit.

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## RESULTS OF EXPERIMENTAL STUDIES

The aim of my experimental studies during the early 1930s was to prolong the duration for surgical removal of obturating lung emboli. In 1927 I had performed two such operations successfully despite the restricted time then available. My intention was to prolong these time periods without allowing such a lack of oxygen in the organs, particularly in the brain, that resumption of normal functions became impossible. During these experiments I learned, among other things, the results both of of clamping different big vessels within the thoracic cavity and of cross-clamping the aorta, both centrally near the heart and more peripherally after the origin of the major vessels. Such aortic clamping was performed with and without artificial brain circulation.

## DUCTUS BOTALLI OPERATIONS

Thanks to the results of these various aortic cross-clampings on experimental animals, I

dared, in the beginning of my series of patients with Ductus Botalli, to cross-clamp the aorta both above and below the origin of the ductus for periods of a few minutes. This was done to enable me to place aortic sutures calmly after division of the Ductus Botalli, which I believed was better and safer in many cases than just ligating the ductus. Because of complications during this phase of the operation in a patient with a very wide ductus, in whom the aortic wall was thin and fragile, the aortic cross-clamping lasted almost 17 minutes. No circulatory disturbances resulted to other organs. These experiences with cross-clamping of the aorta led me to consider the possibilities of radical correction of coarctation of aorta and end to end anastomosis. The aortic cross-clamping time would be unlimited due to the rich collaterals. However no patients were referred to me or my Cardiologist colleagues. I was able to perform the first operation for coarctation of aorta in October 19, 1944. This was reported in Nordis medicine 20: 864, 1945. The first report in English literature of my work appeared in Journal of Thoracic Surgery 14: 347, 1945.

In my lecture to the American College of Surgeons on July 5, 1958 I reported my series of 216 patients who had undergone resection of coarctation until January 1958. In the first 36 patients I used a continuous over and over suture with a few interrupted sutures. In this series insufficiency of the suture line was a frequent complication. In the remaining 180 patients I used a continuous everting suture which practically excluded complication from suture line. Only in rare cases I have used grafts during my career.

The primary mortality did not exceed 6%, with the technique of end to end anastomosis with everting sutures. I also learnt from my series that coarctation is often combined with other congenital and acquired malformations.