EROSION OF RIBS IN COARCTATION OF THE AORTA

A NOTE ON THE HISTORY OF A PATHOGNOMIC SIGN

BY

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The reader of Bramwell's excellent study of coarctation of the aorta (1947) will have obtained a somewhat incomplete and faulty impression of the place of rib erosion in the diagnosis and in the medical history of that anomaly, for he is referred to "Roesler's classical paper" of 1928, and "similar observations" of Railsbach and Dock published "the following year." In an earlier paper describing the study of the distribution of notching of the ribs, Bramwell and Jones (1941) had not dealt with the historical side.

Erosion of the ribs due to coarctation was first emphasized by English clinicians—Craigie (1841) and Walshe (1873)—as a regularly observed anatomical lesion. It was completely overlooked by early radiologists, and in Roesler's long paper on coarctation (1928) the presence of erosions in one case was noted in passing. As Roesler did not refer to the reports of Meckel (1827) and Jordan (1830), or to the English literature, he failed to draw attention to rib erosion as an important point in diagnosis. Rib erosion is not referred to in the title of the paper, which did not attract the attention of radiologists. This paper was in the December 1928 issue of *Wiener Archiv für Innere Medizin*, which, like many Austrian publications, came out weeks after its date of issue.

The paper of Railsbach and Dock (1929) entitled *Erosion of the Ribs in Stenosis of the Isthmus (Coarctation) of the Aorta* appeared in *Radiology*, January 1929, and was in the hands of subscribers during that month. Since most of these readers had in their files cases showing this lesion, but undiagnosed, and cases of known coarctation in which the erosions had been missed, it is safe to say more erosions were first correlated with the aetiological factor in the first three months of 1929 than in any

similar period in history. Awakening of interest in coarctation among radiologists dates from that article. As the authors were familiar with the nineteenth century literature, they emphasized that these erosions were pathognomonic, and they minimized the diagnostic value of study of the cardiac and aortic silhouettes. With this, all subsequent authors have agreed. Roesler's paper is a classic on the cardiac silhouette in coarctation, but later authors failed to corroborate his views on its diagnostic value. Railsbach and Dock's paper, which appeared simultaneously, stressed erosion of the ribs, summarized older anatomical knowledge, reproduced Meckel's original picture of rib erosion (1827) and has been confirmed by all subsequent students. In routine chest films more cases of coarctation are detected by rib notching than by all other methods of physical examination put together. No cases are diagnosed by the cardiac silhouette in such routine films. Many cases, overlooked by physicians who recorded elevated blood pressure, have been picked up from rib erosions seen in 35 mm. films of employees or college students, or in the routine films of the American draftees and enlisted personnel.

For the English reader it may be of interest that a fact known to the great English cardiologists was confirmed and its practical value in the Roentgen era brought to the attention of radiologists by a California physician. Just as Cesalpino's fellow-countrymen ignored his discovery and description of the circulation of blood, Craigie's and Walshe's fellow-countrymen were unaware of the classic descriptions of rib erosion as a result of coarctation of the aorta, and those who spoke the same language as Meckel were not aware of Meckel's paper on this subject. Priority of discovery belongs to Meckel.

EDITORIAL NOTE

An interesting point in connection with Meckel's original illustration of the collateral vessels in coarctation of the aorta is that the erosions are shown on the upper borders of the ribs, though as we now know they actually occur only on the lower borders. Meckel's figure shows erosions on the upper borders of the third and fourth ribs on the right side, none being shown on the left side. It seems probable that the artist was responsible for this remarkable error.

Dr. Dock refers to Crichton Bramwell's paper on coarctation, and it is interesting to find that the only contemporary reference to Walshe's statement that the dilated collateral vessels might wear away the ribs is in Byrom Bramwell's *Diseases of the Heart* published in 1884.

Maude Abbott (1928), in her monograph on coarctation of the aorta in the *American Heart Journal*, April 1928, published a radiograph in which erosion of the ribs is well seen, and a few pages later reproduced Meckel's original anatomical figure together with a legend in which the rib

erosions are specified, yet the radiographic notches escaped her notice.

At the meeting of the Cardiac Club in 1930, I presented "a case of coarctation of the aorta showing Roesler's sign." This was a patient under the care of Dr. G. E. Beaumont at the Middlesex Hospital in whose radiograph notching of the ribs was noticed by Dr. Maurice Weinbren in May 1929. In seeking an explanation, he came across the paper of Railsbach and Dock, to which he drew my attention. Before presenting the case, I discovered Dr. Roesler's reference to rib erosion and discussed it with him in Vienna, which explains my use of the eponym at the time.

The merit of drawing attention to the diagnostic significance of rib erosion certainly belongs to Railsbach and Dock, who first portrayed it and correlated it with previously recorded anatomical observations which had been generally overlooked. Dr. Dock emphasizes the importance of Meckel's original description, even though Meckel portrayed the rib notches incorrectly.

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REFERENCES

- Bramwell, C., and Jones, A. M. (1941). *Brit. Heart J.*, 3, 205.
— (1947). *Ibid.*, 9, 100.
- Railsbach, O. C., and Dock, W. (1929). *Radiology*, 12, 58 (earlier literature cited here).
Roesler, H. (1928). *Wien Arch. inn. Med.*, 15, 521.