

reach the scene of any accident in future, besides enabling the service to continue and increase its valuable advisory service.

## Rib Notching

In 1827 A. Meckel,<sup>1</sup> of Bern, described a case of narrowing of the aorta at the level of the fourth dorsal vertebra. This was associated with gross hypertrophy of intercostal arteries which had caused notching of the ribs. Other similar cases were published in the nineteenth century, but it was not until 1928, 33 years after the discovery of  $x$  rays, that H. Roesler<sup>2</sup> described the sign which is so often linked with his name. For some years after this the radiological sign of notched ribs was thought to be pathognomonic of coarctation of the aorta, but it is now known that there is no such specificity about the sign and that it can be associated with a number of conditions mostly of a vascular nature. W. Wilson<sup>3</sup> proposed a classification of causes of rib notching: first, vascular, which might be arterial, venous, or arteriovenous; secondly, neural, associated with neurofibromatosis; thirdly, idiopathic, where no underlying cause was demonstrated; and, fourthly, pseudo rib notching in which irregular cortical thickening of long bones, including the ribs, may occur. This is occasionally seen in tuberose sclerosis and hyperparathyroidism.

Recently C. J. Drexler and his colleagues<sup>4</sup> and M. L. Boone and his co-workers<sup>5</sup> have given fairly extensive reviews of rib notching with illustrative cases, and it seems generally agreed that coarctation of the aorta is the commonest cause. G. H. Reifstein and his colleagues<sup>6</sup> found rib notching in coarctation of the aorta in 75% of 43 cases. The findings were all confirmed at necropsy, and the youngest patient in whom notching was found was an 11-year-old boy. J. P. Caffey<sup>7</sup> stated, "The costal erosions which are considered a pathognomonic sign in adults are always absent during the first years of life, and are always poorly developed prior to adolescence," and probably the development of rib notching is related both to age and to the severity of the aortic obstruction.

Though rib notching is usually bilateral it is not always so,<sup>8</sup> and sometimes very few ribs are notched. In recent years an iatrogenic cause has had to be added to the list. J. V. Kent<sup>9</sup> described two cases in which unilateral rib notching developed shortly after the Blalock-Taussig procedure of subclavian-pulmonary arterial anastomosis for cyanotic heart disease, and other examples have been reported since. Notching has been seen in Fallot's tetralogy (before operation) and in other types of congenital heart disease.

Since notching of the inferior border of the rib is merely a manifestation of a collateral circulation in which the intercostal arteries are involved it is not surprising to find that the sign is also associated with obstruction of the lower

thoracic or upper abdominal aorta. Here only the lowest ribs are notched, while in coarctation the extreme upper and lower ribs are usually spared. Furthermore, obstructive syndromes of the superior vena cava and its larger branches can lead to dilatation of intercostal veins and thus to rib notching. Probably the first case to be described was that of M. C. McCord and F. A. Bavendam.<sup>10</sup> Their findings were confirmed at necropsy, and it is interesting to note that the intercostal arteries were normal. Pulmonary arteriovenous fistulae are associated with rib notching when the systemic circulation takes part in the blood supply of the fistula.

Rib notching of a non-vascular cause is very rare, but the same erosive process can be caused by neurinomas of the intercostal nerves. The bony manifestations of tuberose sclerosis and hyperparathyroidism, when present in the ribs, produce a picture which can be indistinguishable radiologically from the commoner pressure erosions.

B. Felson<sup>5</sup> and his colleagues stated that slight degrees of rib notching are not uncommon in otherwise apparently healthy individuals. They examined 1,000 chest radiographs obtained by mass survey and found it to be present to a mild degree in the medial half of the posterior ends of ribs in 19% and to a moderate degree in 2.2%. Further assessment of its incidence might come from a study of a large number of cases at necropsy.

## Child Care in General Practice

It is a commonplace that patients at the extremes of life—the very young and the old—provide the bulk of work in general practice. These patients come to their doctor more often than his other patients; in both young and old clinical signs of serious disease may be muted or difficult to interpret; and in sick infants and small children physical deterioration can occur alarmingly quickly. On the other side of the medal, however, there can be few more satisfying achievements in medicine than the cure of a seriously ill child, or the gradual, often halting, conversion of a sickly or emotionally inadequate child into a robust and balanced adult. Few things bring more deserved gratitude to the general practitioner.

At p. 1179 of this issue we print the first of a series of practical articles on child care in general practice. These are the natural successors of the G.P. articles on obstetrics which we published earlier this year. They take the child from infancy to adolescence, and in their approach are focused on care in its broadest sense, not just the diagnosis and medical or surgical treatment of childhood disease. Thus the series will include articles on normal development, adoption, puberty, and behavioural and emotional problems as well as on asthma, urinary infections, skin troubles, and the acute abdomen. The first article of the series by Dr. R. Mac Keith, "The Paediatric Consultation," recalls once again Sir James Spence's dictum that the essence and culmination of a successful consultation are clear explanation to the patient, in terms that he (or his parents) can understand.

We are much indebted to the many experts who have responded to our invitation to contribute to this series. Each has consulted with one or more general practitioners in preparing his article, and we believe that the wisdom of this is fully reflected in the practical nature of the final product. We hope that general practitioners and others will find the series helpful.

<sup>1</sup> Meckel, A., *Meckel Arch. Anat. Physiol.*, 1827, p. 345.

<sup>2</sup> Roesler, H., *Wien. Arch. inn. Med.*, 1928, 15, 521.

<sup>3</sup> Wilson, W., *Brit. J. Radiol.*, 1960, 33, 765.

<sup>4</sup> Drexler, C. J., Stewart, J. R., and Kincaid, O. W., *Amer. J. Roentgenol.*, 1964, 91, 1064.

<sup>5</sup> Boone, M. L., Swenson, B. E., and Felson, B., *ibid.*, 1964, 91, 1075.

<sup>6</sup> Reifstein, G. H., Levine, S. A., and Gross, R. E., *Amer. Heart J.*, 1947, 33, 146.

<sup>7</sup> Caffey, J. P., *Pediatric X-ray Diagnosis*, 1961, 4th ed., p. 472, Year Book Publishers, Chicago.

<sup>8</sup> Cleland, W. P., Counihan, T. B., Goodwin, J. F., and Steiner, R. E., *Brit. med. J.*, 1956, 2, 379.

<sup>9</sup> Kent, J. V., *Brit. J. Radiol.*, 1953, 26, 346.

<sup>10</sup> McCord, M. C., and Bavendam, F. A., *Amer. J. Roentgenol.*, 1952, 67, 405.