Reversal of renovascular hypertension caused by nonspecific aortitis after corticosteroid therapy

T. P. Kulkarni, I. A. D'Cruz, M. J. Gandhi, and D. S. Dadhich

From the Department of Surgery and Medicine, Lokmanya Tilak Municipal General Hospital, and Medical College, Sion, Bombay, and the Department of Cardiovascular Surgery and Radiology, Bombay Hospital and Medical Research Centre, Bombay, India

Aortography in a 17-year-old girl showed nonspecific stenosing aortitis affecting the abdominal aorta, the renal arteries on both sides, and the left subclavian artery. The central aortic pressure was 180/115 mmHg. Prednisolone was administered for 8 months, and subsequently aortography was done annually on 3 occasions. This showed a pronounced regression in the stenotic lesions of the aorta and renal arteries; concomitantly the central aortic pressure returned to normal.

Renovascular hypertension secondary to nonspecific aortitis of unknown aetiology is not uncommon in India (Sen, 1968; D'Cruz *et al.*, 1970) and other Asian countries (Nakao *et al.*, 1967; Danaraj, Wong, and Thomas, 1963; Vinijchaikul, 1967; Thenabadu, Rajasuriya, and Wickremasinghe, 1970). In our experience these patients usually present in the fibrotic end-stage of aortitis, at which time vascular surgery offers the only hope of cure (Sen, 1968; D'Cruz *et al.*, 1970); but in a few cases, as reported here, the diagnosis is made while the patient is still in the phase of active arteritis.

To our knowledge, regression of stenosis of the aorta or renal artery accompanied by a return of high blood pressure to normal, either spontaneously or after corticosteroid therapy, has never been documented previously.

Case report

A 17-year-old girl was referred to us in August 1969 with claudication in both lower limbs and the left upper limb. There were no other features apart from general weakness and malaise, and a febrile episode lasting for about a fortnight, one month previously.

On examination, very feeble pulses were felt in the left upper limb and both lower limbs. The blood pressure measured in the right arm was 110/70 mmHg. In the left arm and the lower limbs a very narrow pulse pressure of only a few millimetres of mercury was found; the systolic pressure in the left arm was 80 mmHg and in both the legs 110 mmHg. No other abnormal findings were detected on physical examination.

The electrocardiogram and chest x-ray were normal.

Red blood cell count 4,520,000/mm³; Hb 10 g/100 ml, PCV 36 per cent; WBC: total 13,000/mm³, neutrophils 88 per cent (band forms 25.5%, segmented forms 62.5%), eosinophils 1 per cent, lymphocytes 5 per cent, monocytes 6 per cent. Bone marrow was essentially normal. ESR (Wintrobe) was 56 mm, and on another occasion 60 mm, after 1 hour. Blood examination was negative for LE cells. Serum proteins, total 7.4 g/100 ml, by electrophoresis, albumin 2.5 g/100 ml, total globulin 4.9 g/100 ml (α_1 fraction 0.32 g/100 ml, α_2 fraction 1.5 g/100 ml, β fraction 1.12 g/100 ml, γ fraction 1.96 g/100 ml). Urine examination revealed nothing abnormal. Creatinine clearance was 147 l./24 hours. The radio-hippurate renogram was reported as suggestive of left renal artery stenosis.

An aortic arch angiogram was done on 24 September 1969 from the right brachial artery, using the Seldinger technique. The blood pressure, measured directly in the aortic arch on this occasion, was 180/115 mmHg. The aortogram demonstrated a left subclavian artery block at its origin (Fig. 1), the distal portion of this artery being patent. The other arteries arising from the aortic arch were normal. The descending thoracic aorta was of normal calibre. Stenosis of the axillary or proximal brachial artery on the right side was presumed to exist, since a large gradient was found between the central aortic pressure and distal brachial artery pressure.

A week later an abdominal aortogram, by the percutaneous translumbar route, showed an elongated constriction of the abdominal aorta below the level of the renal arteries. There were two renal arteries on each side, and all four were narrowed at and near their origin (Fig. 2a).

Two weeks later, while under inpatient observation, the patient developed another episode of fever (38.3°C) lasting 2 days, followed by a painful and tender enlargement of lymph nodes in the left submandibular and right

FIG. 1 Aortogram showing left subclavian artery, occluded at its origin, and distal narrowed segment (black arrows).

jugulodigastric regions. Biopsy of an inflamed left submandibular lymph node was reported on histologically as 'nonspecific chronic lymphadenitis'. The lymphadenitis subsided spontaneously over the next 10 days without any specific therapy. No antituberculous chemotherapy was given.

Because of the high ESR and globulin levels suggestive of active arterial inflammation, prednisolone was administered in a daily dose of 20 mg during the first month, 15 mg during the second month, and 10 mg thereafter for the next 6 months.

The patient was next seen by us in October 1970, when aortography revealed a regression of the stenosis of the abdominal aorta as well as that of the renal arteries (Fig. 2b). The blood pressure, as measured directly in the upper abdominal aorta on this occasion, was 130/80 mmHg.

Repeat aortograms in November 1971 (Fig. 2c), and September 1972 (Fig. 2d) showed a further improvement in the calibre of the lower abdominal aorta and of the renal arteries.

Comments

Although the published reports on Takayasu's disease and nonspecific aortitis contain many a passing mention of corticosteroid therapy, there has been very little documentation of objective improvement in blocked or stenotic arterial lesions. In fact very little work has been published on the natural history of non-specific aortitis as revealed by serial aortography.

Reporting on a joint study by several Japanese centres, Nakao *et al.* (1967) stated that cortico-

steroids had been given to 29 of their 84 patients. Of these 29, 5 experienced 'remarkable clinical remissions', 13 'sufficient remissions', and 11 a 'poor effect'. The radial pulse 'became palpable' in 5. According to Table 9 of Nakao's paper, aortographic evidence of 'remarkable effect' was present in 4 patients and of 'satisfactory effect' in 8 patients, but no specific mention was made of improvement in hypertension or amelioration of stenotic lesions affecting the abdominal aorta or its branches.

The ESR is a good indicator of inflammatory activity in nonspecific stenosing aortitis (Nakao *et al.*, 1967). The fact that corticosteroid therapy can reverse arterial stenosis, as in our patient, suggests that it is worth a trial in every case with a high ESR, even when hypertension is present.

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Requests for reprints to Dr. I. A. D'Cruz, Lokmanya Tilak Municipal General Hospital and Medical College, Sion, Bombay 400 022, India.

FIG. 2 Abdominal aortograms, a) in September 1969, showing elongated constriction of the aorta and stenosis of the renal arteries near their origin; b) in October 1970; c) in November 1971; and d) in September 1972.