

# Coronary artery ectasia

## *Its prevalence and clinical significance in 4993 patients*

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**SUMMARY** To assess the clinical significance of coronary artery ectasia 4993 consecutive coronary arteriograms were reviewed to identify patients with this condition and to allow the assessment of their progress. Coronary ectasia was a relatively uncommon finding (overall incidence 1.4%). It was not related to the development of aortic aneurysms and did not affect the outcome, results of coronary artery surgery, or symptoms.

Coronary artery ectasia has been a well recognised, if uncommon, pathological finding for many years.<sup>1</sup> The advent of cardiac catheterisation allowed the diagnosis to be made in life, and associations have been reported with trauma,<sup>2</sup> polyarteritis nodosa,<sup>3</sup> Takayasu's disease,<sup>4</sup> mucocutaneous lymph node syndrome,<sup>5</sup> congenital abnormalities,<sup>6</sup> and syphilis. In western populations the most common association is with atherosclerotic coronary artery disease. Estimates of the incidence of coronary ectasia have varied from 0.3%<sup>7</sup> to 4.7%.<sup>8</sup> As definitions of ectasia in the various published series are similar these differences may reflect differences between the populations studied, observer bias, or random variation in the smaller series. Most published series suggest that the incidence in patients investigated for ischaemic heart disease is between 1% and 2.5% (1.2%,<sup>9,10</sup> 1.3%,<sup>11</sup> 1.5%,<sup>12</sup> 2.2%,<sup>13</sup> and 2.5%<sup>14</sup>).

The clinical significance of coronary ectasia is not clear. It has been suggested that the presence of ectasia alone is as important as the presence of coronary artery stenosis.<sup>9</sup> Another study showed no difference from a control population with ischaemic heart disease.<sup>8</sup> An association with aortic aneurysm has also been reported,<sup>15</sup> although most series do not mention any relation between the two. It has been said that the presence of ectasia does not affect the outcome of coronary bypass grafting unless the graft is sutured into the wall of the ectatic segment.<sup>13</sup>

We reviewed a large series of patients undergoing

coronary angiography to determine the incidence of coronary ectasia. In addition, we tried to assess its clinical significance, especially in terms of mortality and effect on coronary artery surgery.

### Patients and methods

Over the period 1976-82 all coronary angiograms at this hospital were reported by the same two radiologists (usually together but sometimes singly). Coronary artery ectasia was diagnosed when a segment of artery was more than 1.5 times the diameter of adjacent normal segments of artery (Figs. a and b).

The case notes of those patients who were diagnosed as having ectasia were reviewed to assess the distribution of ectasia and associated stenosis and obtain details of subsequent cardiac surgery, aortic aneurysm, death, or other cardiac events. Where patients had been followed elsewhere details were requested from the patient's general practitioner. Full follow up data were available on 47 of the 70 patients with ectasia.

### Results

Over the study period 4993 patients underwent coronary angiography. Of these, 1598 had normal coronary angiograms and 96 had minor narrowing (< 50% reduction in diameter) and 3299 significant narrowing (> 50% reduction in diameter) of at least one coronary artery (Table 1). Coronary artery ectasia was diagnosed in 70 patients, 12 of whom had minor narrowing and four none (Table 1). There was a pronounced difference between the sexes. Of the 1051 female patients studied, 414 (39%) had significant coronary artery stenosis but only two

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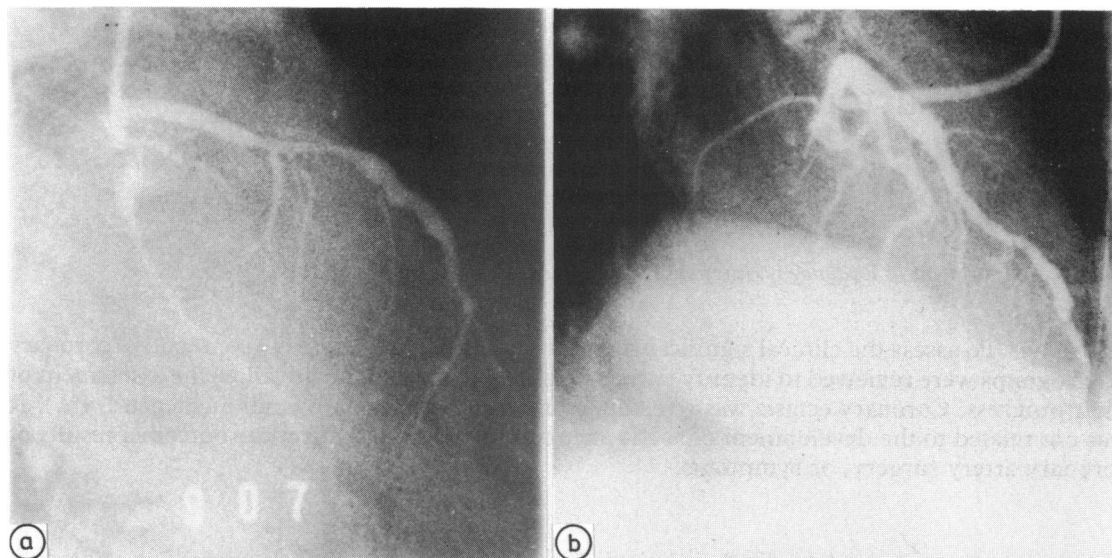


Figure Coronary angiograms showing (a) gross ectasia affecting the left anterior descending and circumflex arteries and (b) mild ectasia affecting the circumflex artery.

(0.5% of those with stenosis) had coronary artery ectasia (Table 1). This contrasts with the male patients, in whom 64 of 2885 (2.2%) with coronary narrowing had ectasia.

Twenty six (37%) patients with ectasia underwent coronary bypass grafting and two (3%) angioplasty. The mortality rate during the follow up period (mean 3.2 years after coronary angiography) was two deaths (out of 26) after surgery (7.7% of those operated on, 2.4% per annum) compared with three deaths among those treated medically (out of 21 in whom full follow up data were available, 13% of those treated medically, 4.6% per annum) (Table 2). In the surgical group one death occurred 10 days after repair of an aortic aneurysm, the other 21 months after surgery. The two patients who underwent angioplasty remained well with no further symptoms (mean follow up 13 months).

Of all cases of coronary artery disease (3299 patients), 39 (1.2%) also had aortic aneurysms. Two of the patients with ectasia had, or had had, an aortic aneurysm (one of whom had Marfan's syndrome). The right coronary artery was the vessel most commonly affected by ectasia (40% of affected vessels) with the left anterior descending affected in 29%, circumflex affected in 24%, and left main affected in only 7% (Table 3). On average ectasia affected slightly fewer than two vessels in each patient with the condition.

Coronary artery ectasia was diagnosed in only four (0.25%) patients with otherwise normal coro-

Table 1 Results of coronary angiography (1976-82). Figures are numbers of patients

	Total	Men	Women
All patients	4993	3942	1051
No with:			
Significant stenosis	3299	2885	414
Ectasia	70	68	2
Aortic aneurysm	39	27	12
Ectasia and significant stenosis	58	56	2
Ectasia and aortic aneurysm	2	2	0

Table 2 Outcome in patients with ectasia

	No of patients	No of deaths
All patients	70	5
No treated:		
Surgically	26	2
Medically	44	3

nary arteries. One had a long history of hypertension, one Marfan's syndrome with a thoracic aortic aneurysm, and one mitral valve prolapse but no other features of Marfan's syndrome. A fourth patient returned to the Middle East immediately after angiography, and further details were not available.

## Discussion

Previous reports of coronary ectasia have, with one

Table 3 Distribution of ectatic vessels. Figures are numbers (%) of patients

	Coronary artery				Total
	Left main	Left anterior	Circumflex	Right	
Present series	10 (7)	41 (29)	34 (24)	52 (40)	70
Pooled data*	—	17	23	41	70

\*From refs 10, 11, and 14.

Table 4 Comparative incidence of ectasia at coronary angiography

	Total No of cases	Cases of ectasia	% with ectasia
Present series	4993	70	1.4
Coronary Artery Surgery Study <sup>8</sup>	20087	978	4.9
Markis <i>et al</i> <sup>9</sup>	2457	30	1.2
Swanton <i>et al</i> <sup>10</sup>	1000	12	1.2
Befeler <i>et al</i> <sup>11</sup>	1246	16	1.3
Falsetti <i>et al</i> <sup>12</sup>	742	11	1.5
Alford <i>et al</i> <sup>13</sup>	1654	37	2.2
Aintablian <i>et al</i> <sup>14</sup>	1660	42	2.5
Pooled data*	8759	148	1.65

\*From refs 9–14.

exception,<sup>8</sup> dealt with smaller numbers of patients and produced some conflicting conclusions (Table 4).

It has been suggested that coronary ectasia alone may be a cause of angina.<sup>9,11</sup> Of our patients with ectasia in otherwise normal coronary arteries, one had a thoracic aortic aneurysm, which was presumably the cause of his pain. Another had mitral valve prolapse and atypical chest pain, which did not respond to conventional medical treatment. One patient was lost to follow up, but his pain was also atypical. The fourth patient had atypical pain that disappeared after angiography. He remained pain free over four years later with no treatment. It seems that in patients with true angina ectasia accompanies at least some degree of coronary artery narrowing. It is difficult to say which is the more important lesion, but it seems unlikely, on this evidence, that ectasia alone is a cause of angina.

Slow or turbulent blood flow in a dilated vessel might be expected to lead to thrombosis and a high mortality rate. Indeed such an increased mortality rate in association with ectasia has been reported.<sup>9</sup> In that study ectasia was associated with a higher incidence of three vessel disease, and this may have been responsible for the high mortality rate. Another, larger, study found no difference from a control group, irrespective of whether treatment was medical or surgical.<sup>8</sup> No suitable control group was available for our series, but mortality rates were within the range that would be expected for a group of patients with this distribution of coronary artery disease. The mortality for those with coronary ectasia who were treated medically (13% over three

years) is similar to the five year mortality (16%) in the European Coronary Surgery Study.<sup>16</sup> In the group treated surgically the mortality of 7.7% after three years is similar to a three year surgical mortality of 6% in the European Coronary Surgery Study.<sup>16</sup> The mortality rate after surgery for angina in other series is similar at about 2% a year.<sup>17,18</sup> None of the patients with minimal narrowing died. The three patients who died without operation all had severe three vessel disease and poor left ventricular function. In the surgical group one patient died 10 days after repair of a type 1 aortic dissection involving the aortic valve. The other surgical patient died 21 months after coronary artery bypass grafting for three vessel disease with poor left ventricular function. It seems that the presence of coronary artery ectasia does not independently affect symptoms, the results of coronary artery surgery, or mortality.

The previously reported strong association with aortic aneurysms<sup>15</sup> is not supported by our figures. Two patients had or had had an aortic aneurysm (one being a case of Marfan's syndrome). No patients developed an aortic aneurysm in the follow up period. The incidence in those with coronary artery narrowing and ectasia was 3%. Of all the patients with coronary artery disease, 1.2% had aortic aneurysms. This difference is not significant in view of the numbers involved.

The difference between the sexes has been reported before,<sup>8</sup> but not to the same degree. Even when allowance is made for the lower incidence of severe coronary artery disease in women the difference is still pronounced (women 0.5%, men 2.2%).

The overall incidence of ectasia in our series was 1.4% (2.0% of all cases with coronary artery stenosis). This agrees with the results of most previous smaller series using similar diagnostic criteria.<sup>9-11</sup> The results of the Coronary Artery Surgery Study group are appreciably different (4.9% of all cases).<sup>8</sup> This may reflect differences between an American and a predominantly British population. Alternatively, although very similar diagnostic criteria appear to have been used, there may have been variations in the diagnosis between the 15 participating centres in the American series. In our study the same two radiologists reported the angiograms throughout, and the incidence of ectasia was relatively constant from year to year.

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