Correspondence

Accuracy of angiographic appearances of the coronary arteries

Sir,

The assertion by J Pidgeon *et al* (1984; 51: 125-9) that their findings are at variance with our observations on the "underfilled" coronary artery¹ is not entirely correct. In our retrospective series of arteries that had been grafted, some vessels that were smaller than 1.5 mm on the preoperative angiogram were patent at one month and appeared larger on the postoperative angiogram. Some were filled by visible collaterals and some were not. Pidgeon *et al* found that when vessel diameter alone was used as a predictive test 26% of vessels thought too small were, at surgery, graftable; there was no postoperative assessment of these vessels. We consider that these two series are complementary, and the inference to be made is that some of the graftable but angiographically small vessels of Pidgeon *et al* may well have been "underfilled."

Their finding that arteries of reasonable size were only 85% suitable for grafting is probably due to an optimistic choice of critical diameter of 1 mm. Certainly, graft survival at or below 1 mm diameter is very poor.^{2,3} It would be interesting to know what their figures would be at 1.5 mm diameter.

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P W T Brandt,
Greenlane Hospital, Auckland, New Zealand

References

- 1 Partridge JB, Brandt PWT, Whitlock RML. The underfilled coronary artery; some pre- and post-operative observations on recipient arterial quality and left ventricular function after coronary artery surgery. *Clin Radiol* 1978; 29: 5-8.
- 2 Lesperance J, Bourassa MG, Biron P, Campeau L, Saltiel J. Aorta to coronary artery saphenous vein grafts; preoperative angiographic criteria for successful surgery. *Am J Cardiol* 1972; 30: 459-65.
- 3 Levin DC, Carlson RG, Baltaxe HA. Angiographic determination of operability in candidates for aorto-coronary bypass. *AJR* 1972; 116: 66-73.

This letter was shown to the authors, who reply as follows:

We are grateful to Partridge and Brandt for their

interest in our paper. To the extent that 27% of vessels considered small on angiographic assessment and which filled via collaterals were later found to be suitable to receive grafts we agree that our observations may be complementary. The point we wished to make was that we also made erroneous prediction of calibre for normally filled branches, and our ability to predict lumen diameter did not deteriorate significantly for those filled via collaterals (predictive accuracy 84% *vs* 78% respectively). We submit that when these vessels appear small on the angiogram they are still likely to be too small to graft at operation, although on occasions our predictions were wrong. Some of these vessels may be "underfilled" and appear inappropriately small on the preoperative angiogram owing to reduced perfusion pressure. Many collaterally filled vessels were only faintly opacified so that estimation of size becomes more difficult but is still possible with reasonable accuracy. In this context details of angiographic technique may be relevant.¹

Our figure for angiographic predictive accuracy in assessing suitability for grafting using a cut off point of 1.0 mm was 76%, while the comparable figure at 1.5 mm was 73% (unpublished data). These data relate to the measurements of lumen diameter on the angiogram, and as discussed in our paper prediction (using a value of 1.0 mm) was better using the consensus assessment of the three angiographic observers (85%). Subsequent graft patency is an important issue but not one directly addressed in our study. It seems probable, and the data of Lesperance *et al* support this, that the chance of graft survival is not distributed in a dichotomous manner pivoted about a critical value for lumen diameter but varies over a range of values in the region of 1.0 to 2.0 mm. The choice of a particular value in our study is to some degree arbitrary. A value of 1.2 mm was used by Gohlke *et al*.²

We suggest that an attempt at grafting to a vessel of diameter of 1.0 mm may still be worth while, although we accept that the prospect of lasting patency is relatively diminished. The recent observations of Levin *et al*³ support this premise.

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References

- 1 Levin DC, Beckmann CF, Garnic JD, Carey P, Bettmann MA. Frequency and clinical significance of failure to visualize the conus artery during coronary arteriography. *Circulation* 1981; 63: 833-7.
- 2 Gohlke H, Gohlke-Bärwolf C, Samek L, Stürzenofecker P, Schmuziger M, Roskamm H. Serial exercise testing up to 6 years

after coronary bypass surgery: behaviour of exercise parameters in groups with different degrees of revascularization determined by postoperative angiography. *Am J Cardiol* 1983; 51: 1301-6.

- 3 Levin DC, Cohn LH, Koster JK Jr, Collins JJ Jr. The reliability of angiography in predicting quality and caliber of the distal artery lumen in preparation for bypass surgery. *Circulation* 1983; 68 (suppl II): 185-9.

Submaximal exercise testing early after myocardial infarction

Sir,

Exercise testing after myocardial infarction has undoubted prognostic value.^{1,2} Controversy remains, however, about both the reproducibility and sensitivity of such tests^{3,4} and is compounded by differences in patient selection, timing, and drug treatment.

Sullivan, Davies, and Sowton (1984; 52: 147-53) exercised 74 postinfarction patients and obtained a positive result in 54 (73%). Twelve patients were, however, taking beta blocking drugs, five of these having a negative test and a further two being limited by fatigue alone. Moreover, in four beta blocked patients there was an inadequate blood pressure response to exercise.

Others have drawn attention to the possible reduction in sensitivity of the exercise test in patients receiving beta blockers,⁵ and in a subsequent report Sowton and colleagues concede that "beta blockers may blunt haemodynamic responses and mask ischaemic changes."⁴

We have found that beta blockade invariably affects ST segment changes of the predischARGE test, the degree of ST segment shift after beta blockade being reduced or indeed absent depending on the initial magnitude of such elevation/depression. End points may also be affected—for example, that of fatigue replacing those of ST changes or angina before beta blockade.

Patients with myocardial infarction receiving short term treatment with beta blockers should therefore have their drugs withheld before the predischARGE test if this is to be of optimal sensitivity.

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J Watkins,
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References

- 1 Thérout P, Waters DD, Halphen C, DeBaisieux JC, Mizgala HF. Prognostic value of exercise testing soon after myocardial infarction. *N Engl J Med* 1979; 301: 341-5.
- 2 Handler CE. Exercise testing early after myocardial infarction: discussion paper. *J R Soc Med* 1983; 76: 569-73.
- 3 Haskell WL, Debusk R. Cardiovascular responses to repeated treadmill exercise testing soon after myocardial infarction. *Circulation* 1979; 60: 1247-51.
- 4 Handler CE, Sowton E. Diurnal variation and reproducibility of predischARGE submaximal exercise testing after myocardial infarction. *Br Heart J* 1984; 52: 299-303.
- 5 Gianelly RE, Treister BL, Harrison DC. The effect of propranolol on exercise-induced ischemic S-T segment depression. *Am J Cardiol* 1969; 24: 161-5.

Notices

British Cardiac Society

The Annual General Meeting for 1985 will take place in Birmingham on 17 and 18 April 1985, and the closing date for receipt of abstracts was 8 January 1985. On the second day of the Meeting (18 April) the Society, in conjunction with the Association of Physicians, will hold a one day symposium in commemoration of the bicentenary of the publication of William Withering's account of the foxglove. Only a limited number of places will be available for non-members, who should direct their inquiries to: Professor W A Littler, Department of Cardiovascular Medicine, East

Birmingham Hospital, Bordesley Green East, Birmingham B9 5ST.

The Autumn Meeting will be held at the Wembley Conference Centre, London, on 26 to 28 November 1985, and the closing date for receipt of abstracts will be 1 August 1985.

Doppler ultrasound in the assessment of cardiovascular function

A one day meeting organised by the International Cardiac Doppler Society is to be held at the Great Western Royal Hotel, London W2, on 1 March 1985. Further information may be obtained from: Dr A M Salmasi, St Mary's Hospital, London W2.