

Risks of coronary angiography

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A 66-year-old man presented with subacute renal failure, livedo reticularis, and purple toes 2 months after coronary angiography. Renal biopsy identified elongated biconvex needle-shaped cholesterol crystals occluding the lumen of a small artery. We diagnosed atheroembolism secondary to angiography. We were poorly prepared for the reaction of his family, who could not believe that such a late complication was directly related, and who were angry that they had not been informed of this particular risk when consenting to the angiography.

We did a literature review to ascertain the frequency of atheroembolism secondary to coronary angiography. Atheroembolism was reported in 33 of 24 897 coronary angiograms in four large studies (0·13%).¹ We thought that this figure must be an underestimate since the patients in these studies were not assessed systematically for the presence of atheroembolism in every case. Doing so would require, at the very least, examination of the skin and measurement of renal function at least 2 weeks after the procedure.

We identified only two studies that had used such a systematic approach.^{2,3} Fukumoto and colleagues² assessed 1786 consecutive patients undergoing coronary angiography. Atheroembolism was defined as typical skin changes or an increase in serum creatinine of 50% or more (or both). 25 patients (1·4%) fulfilled these criteria. Four of these 25 required haemodialysis for the first time after coronary angiography, in the absence of any other obvious explanation for their renal failure, and all four died, giving a risk of death from atheroembolism of 0·22%. In a smaller study, Saklayen³ reported atheroembolism in five of 263 (1·9%) post coronary angiography. Two of the five patients died of renal failure. Pooling the results of these two studies gives a rate of atheroembolism of 1·5% (30 of 2049) and a risk of death from atheroembolism of 0·29% (six of 2049).

Other adverse events after coronary angiography include a reported 0·06% risk of myocardial infarction, a 0·05% risk of stroke, and a 0·11% risk of death.⁴ Although these data are now more than 10 years old, similar complication rates are still quoted, presumably because risks inherent in older and sicker patients have been offset by improved catheter design and techniques.⁵ We therefore conclude that the risk of dying from atheroembolism is at least as high as the risk of periprocedural myocardial infarction.

Our patient and his family's distress was compounded by the fact that he remains dependent on dialysis 18 months after initial presentation. In view of current sensitivities regarding the attribution of blame when something goes wrong after a procedure, it might be advisable to warn patients about the possibility of atheroembolism when explaining the risks associated with coronary angiography, emphasising that its onset can be delayed and that they might require long-term renal replacement therapy if they are unlucky enough to develop renal failure.

References

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