

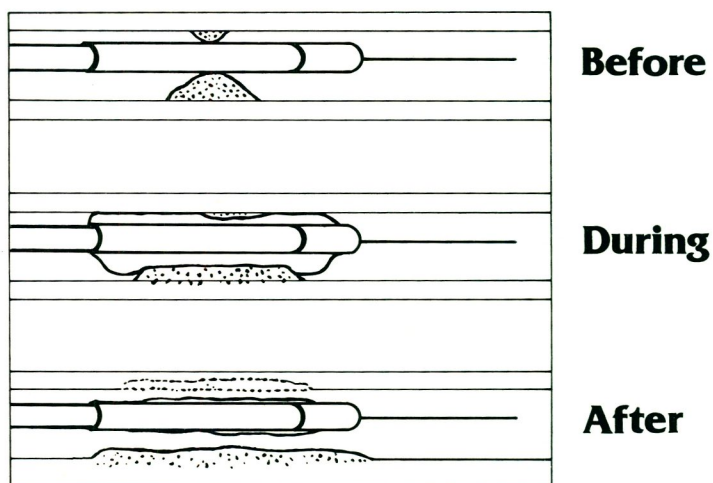
ANGIOPLASTY

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The term angioplasty refers to “percutaneous transluminal coronary angioplasty” (PTCA). This procedure was first described in 1964 by Dotter and Judkins when they passed a solid catheter through a stenosed vessel¹. The idea failed to develop further until 1977 when Greuntzig reported dilatation of a localised stenosis in a coronary artery using an inflatable balloon. Initially this report was received with suspicious incredulity.

In 1984, 15,000 coronary angioplasties were performed in the United States alone². The technique is remarkably straight-forward in conception. A specially designed catheter is passed through a coronary lesion, and a small balloon (commonly between 3 mm and 4.2 mm) is inflated at the sight of the stenosis. Each inflation is made to last 30-60 seconds. The inflation pressure is up to 10 atmospheres. The procedure is performed under local anaesthetic and usually takes not more than one hour.

Diagrammatic representation of the angioplasty balloon before, during and after inflation.



Histological studies have shown that three factors appear important in determining the ultimate result: splitting of the atheromatous plaque, compression of soft material, and dissection of the intima and/or media. Factors known to influence the success rate include lack of calcification within the lesion, the proximity of the stenosis to the coronary ostia, single rather than multi-vessel disease, and the experience of the operator. Two reproducible factors confirm the success of the procedure. One is angiographic evidence that the artery is dilated and the second is functional improvement in terms of symptoms and exercise tests. Recent reports from various centres in the United States suggest that the success rate is 85% in terms of function as well as in findings on repeat coronary angiography.

Like most medical procedures, angioplasty is not without its failures and risks. Reports from 105 centres in the United States from 1977 to 1982 on 3,079 patients who have had percutaneous transluminal coronary angioplasty show that the restenosis rate after 6 months was 25%. The overall in-hospital mortality was 0.9% and immediate surgery was required in 6.7%. In recent years the restenosis rate has been markedly reduced due to the use (some days before and continued thereafter) of calcium agonist, vasodilators and aspirin and/or Persantin to prevent platelet aggregation. One clearly expects these figures to improve as experience increases and catheter technique advances.

Percutaneous transluminal coronary angioplasty is now an accepted alternative to surgery as an effective method of treatment of coronary artery disease³. It is simple to perform, appreciably less expensive than coronary artery by-pass surgery and it can be repeated without increased risk to the patient, particularly as it is becoming evident that by-pass surgery does not provide the ultimate solution for coronary artery disease. If coronary artery surgery has to be repeated it carries inherent and increasing risks to the patient, which therefore, limits its value. Following angioplasty the patient's stay in hospital is not in excess of three days and normal work can be resumed immediately.

Further developments currently being investigated include the role of percutaneous transluminal coronary angioplasty with laser 'vaporisation' of atheromatous lesions.

REFERENCES

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3. Williams DO, Greuntzig AR, Kent KM, Detre KM, Kelsey SF, To T. Efficacy of repeat percutaneous transluminal coronary angioplasty for coronary restenosis. *Am J Cardiol* 1984;53:12:32C-35C.