

Based on a lecture given at the Mitral Valve Meeting 2017 in Zurich

Gruentzig, Senning and a young surgeon: 40 years ago the first heart team

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One of the true epochal successes of modern medicine was the development of percutaneous treatment of coronary artery disease, earlier known as percutaneous transluminal coronary angioplasty (PTCA). It was the well-known pioneering work of Andreas Gruentzig, at that time resident in cardiology at the University Hospital in Zurich, which led to the establishment and popularisation of this technique. But it was not just a stroke of genius; it was the result of tedious experimental work, in both the development of the dilatation catheter itself and its experimental evaluation in the animal laboratory, which finally led to its successful clinical application. In the mid-seventies of the last century, I was staff member in the department of cardiovascular surgery and chief of the animal research laboratory when I was approached by Andreas Gruentzig to evaluate his new idea, dilatation of coronary stenoses by means of a balloon catheter. I developed an animal model (canine coronary 50–70% stenosis, created by a 6-0 silk ligature), which enabled both acute and chronic experiments with Gruentzig's catheter. Abstracts of this experimental work did not attract much attention, in either Europe or the US [1]. The first successful clinical application of the new method in September 1977 again elicited surprisingly little interest in Zurich, and Andreas Gruentzig was invited to test his method in Frankfurt, where his patients no. 2 and no. 4 from his original "Letter to the Editor" in *The Lancet* were successfully treated [2]. In spite of his unmitigated success in the first series of patients, PTCA initially was a risky procedure: 9 of the first 97 consecutive patients developed sudden coronary artery occlusion and had to be taken to the operating room, many under continuous resuscitation. But none of

these patients died and only one developed a myocardial infarction, owing to rapid revascularisation with re-establishment of coronary flow in less than 2 hours [3]. Prior to PTCA, all these early patients were discussed at a catheter conference, a standard procedure at those times, and the decision to use PTCA or coronary artery bypass grafting was reached after discussion between cardiologists and surgeons. This cooperation is now widely heralded as the novel creation of the "heart team".

What can be learned from beginnings of PTCA in Zurich?

- Necessity of a thorough experimental evaluation prior to clinical application
- Strong interdisciplinary interchange and support between cardiology and surgery
- Perseverance in spite of temporary drawbacks
- An innovative idea might not be initially welcome in a sceptical local community: "Nemo propheta in patria sua"

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