The view from the interventionalist†

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Summary

The development of percutaneous valve replacement has broadened the procedural interface between interventional cardiologists and their cardiothoracic surgical colleagues. Our relationship is no longer restricted to the arena of coronary artery disease, and opportunities now exist to share the care of large numbers of high surgical risk patients with severe aortic stenosis. These complex professional relationships have a mutual dependence and many shared objectives that should be centred upon the optimum care of cardiac patients. However, the continuing evolution of technology demands that these relationships evolve with time. A failure to understand this need for mutual change and increased cooperation has previously led to a sense of competition and Departmental separation between cardiac intervention and surgery. These fractured relationships ultimately limit the quality of care that we deliver to our patients.

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In my opinion, the decision by a number of leading cardiac surgeons to participate in the SYNTAX trial facilitated much of our renewed mutual understanding [1]. The study was a head-to-head comparison of an interventional revascularization strategy with Taxus drug eluting stents compared with coronary bypass surgery in patients with either left main coronary disease or multivessel coronary artery disease. Crucially, the performance of the study required a detailed assessment of the patient by the Heart team comprising the participating surgeon and his interventional cardiology colleague. Predictably, the study showed that there was a large population of these patients with severe coronary disease who were not suitable for intervention. These patients were entered into a surgical registry, and the outcomes in this patient group were excellent. Within the randomized cohort, the study demonstrated that bypass surgery was already superior to coronary stenting at 1 year, although this superiority was predominantly confined to the need for a repeat procedure rather than the risk of death/stroke or myocardial infarction [1]. Additionally, repeat revascularization was more likely if the patient was treated with stents, particularly when the disease was complex or if the patient had diabetes. The results of the study were a disappointment to many interventionalists who had considered that the development of drug eluting stent technology had sounded the death knell for the coronary artery bypass graft procedure. A reconsideration of interventional strategies was ensured and the joint development of practice guidelines has subsequently provided a contemporary scaffold for decision making in coronary artery disease [2].

It is now 6 years after we entered the last patient into the SYNTAX study, but the participation by a Heart team in decision making has persisted in Oxford. In my opinion, this is the forum to decide strategy and settle therapeutic debate. Previous suggestions that a patient should be offered the choice of two divergent opinions by an interventionalist and a surgeon are unworkable, divisive and confusing for the patient and their family. Our Heart team discussions can be heated on occasion, but I have no doubt that this legacy of the SYNTAX trial is as important to patient care as the comparative results of the study.

Predictably, interventional practice has continued to evolve, and during the last 5 years, primary percutaneous coronary intervention with stents has become established as an emergency life-saving therapy for patients with ST segment elevation acute myocardial infarction. In my opinion, the most important physiological concepts to come to the fore are the importance of ischaemia testing and the use of the pressure wire to evaluate the functional significance of a coronary stenosis. Numerous studies have demonstrated the inability of coronary angiography alone to predict ischaemia compared with assessment made by pressure wire and using the pressure wire, the FAME study demonstrated that intervention could be improved using the pressure wire to determine which lesions needed stent treatment and which lesions did not! [3]. The COURAGE nuclear substudy demonstrated the incremental impact of the increasing ischaemic burden on prognosis as patients with more ischaemia on nuclear stress testing had tangibly worse outcomes that those without ischaemia [4]. Very recently, the FAME II study comparing outcomes between stents and medical management in patients with ischaemia detected by pressure wire has been prematurely discontinued because of the clear clinical benefit of stents in preventing hospital admission [5]. Taken together, these data have changed the paradigm of interventional revascularization away from an anatomical assessment of the coronaries by angiography towards a targeted approach to relieve ischaemia.

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Identical strategies are clearly applicable to the selection of cases for surgical revascularization and using this approach, future patient outcomes following either form of revascularization are likely to be substantially enhanced.

Percutaneous aortic valve replacement has been a transformational step in the management of aortic stenosis [6]. The procedure has evolved rapidly with newer technology facilitating the approach from the femoral artery in an increased proportion of patients, novel transaortic surgical approaches developed to supplement the apical approach and the use of the subclavian artery as an alternative vascular approach. In those very high-risk patients who are unsuitable for conventional aortic valve surgery, percutaneous aortic valve replacement has been demonstrated to be both life saving [6] and cost-effective [7]. However, interventional cardiologists must continue to recognize the outstanding results from conventional surgical aortic valve replacement. The durability of the percutaneous valves is likely inferior to valves implanted surgically and the rate of stroke, paravalve leakage and defining a strategy to manage coexistent coronary artery disease are major challenges for the next 5 years. Surgeons need to be able to fully understand percutaneous therapies and participate in the procedures to prevent a divergence of professional priorities as this will ensure that the role of conventional valve surgery is neither devalued nor underused. These closer relationships could even lead to fused disciplines in the future. Development of newer devices for valve therapy needs careful regulation and introduction as under-researched low-cost options with unproven outcomes could be detrimental for patients. Ensuring careful data collection and coordination between our specialist societies will consolidate clinical progress, but ultimately these challenges are likely to be met more completely by close individual collaboration between surgeon and cardiologist.

Looking forward, cardiac surgery and interventional cardiology practices are likely to be drawn closer rather than further apart. Our partnerships already happen on the coronary care unit and in the cardiac catheter laboratory when we discuss urgent and emergency cases. Importantly, our relationships are optimized with scheduled regular meetings of the Heart team and these need to be added to our work schedules. The opportunity to explore hybrid revascularization procedures, progress landmark studies such as the EXCEL study of left main stenosis [8] and the development of new percutaneous valve technology all require our close interaction. Mutual cooperation to embrace new technology and optimize our procedural outcomes facilitates the progression of cardiac care for our patients.

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### REFERENCES