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Surgery for aberrant origin of coronary arteries from the aorta: questions that remain and how we may find the answers

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Pregaldini *et al.* have described the results of surgical repair of aberrant origin of coronary arteries (AAOCA) from the aorta. Their study comprises 71 patients that were operated between 2009 and 2022 in 2 University Medical Centers. Thirty-seven patients had associated cardiac procedures, while 34 had isolated repair of AAOCA. It is important to note that only patients who had 'anatomical repair' were included while patients who had CABG were not included in this study [1].

The authors observed that mortality can be very low (no early mortality in their series) and that morbidity can be relatively limited. They conclude that after these operations there exists a satisfying rate of freedom of coronary reinterventions and that most patients benefit in terms of symptom relief.

This brings us directly to one of the many questions that still surround surgery for AAOCA. Symptoms are not always reliable when we define indication for AAOCA surgery or when we study these patients during postoperative follow-up. This is especially problematic for patients who have AAOCA of the right coronary artery who form the major part of the population (79% in this study) and to a lesser degree also for patients with a single coronary ostium. Aberrant aortic origin of the left coronary is generally viewed with more consensus as being an indication for surgery, even in the absence of symptoms [2].

Going back to the population of AAOCA of the RCA: when symptoms are severe, there is no discussion about indication for surgery. A witnessed cardiac arrest or a myocardial infarction linked to the aberrant coronary artery are usually considered good reasons to go for surgery. Atypical chest pain, arrhythmias and even angina cannot always be used to make an indication for surgery. All this is also true for the evaluation of the results of surgery. Postoperative chest pain may or may not be related to the repaired AAOCA and from experience we know that symptoms alone do not distinguish between patients with remaining or recurring coronary stenosis and those who have no obstructions.

This means that we need more information to fine-tune the indication for surgery. Optimal use of CT scan (preferred slide thickness 0.5 mm), ischaemia detection, coronary angiography with Fractional Flow Reserve and Intravascular Ultrasound measurements may help in defining an indication for surgery looking at both anatomical (especially that of the ostium and the course of the aberrant vessel) and physiological aspects. Only multicentre prospective studies that include all these modalities will be able to clarify us better [3].

In the follow-up after surgery, it is important to have a low threshold to repeat imaging (at least a CT scan) when symptoms occur, even when symptoms are aspecific. Late obstruction of an 'anatomical' repair has been observed and complaints can be vague or absent. Contrary to this, Pregaldini *et al.* [1] found no coronary stenoses in 10 patients who were still symptomatic after surgery. Symptoms are not always reliable before and after operative repair of AAOCA.

Another question relates to the choice of surgical technique: unroofing, reimplantation, patch augmentation are all used to 'anatomically' repair AAOCA and there is no evidence that 1 technique is better than the other. Unfortunately, there is no easy answer to this question. Only strictly protocolized studies with imaging before and after surgery may help us out [3].

Considering technique, Pregaldini *et al.* [1] state that 'they are convinced that CABG presents the least favourable option for the treatment of AAOCA'. They argue that competitive flow will lead to a high incidence of graft failure. If competitive flow is allowed to exist their argumentation is correct. However, when CABG is used in AAOCA, the proximal part of the aberrant coronary artery *must* be closed so that there will be no place for competitive flow. Although we agree with the authors that 'anatomical' repair of the ostium is the preferred option, we have frequently used CABG when the result of 'anatomical' repair was not satisfactory, when the patient showed signs of ischaemia intra- or postoperatively or when ostial repair was no option at all (e.g. transseptal course of LAD with compression). CABG will here lead to good results, as long as the proximal part of the AAOCA is closed.

Morbidity after surgery for AAOCA does exist. Coronary ischaemia occurs and may have serious consequences if not treated properly and timely. Pregaldini *et al.* [1] describe a number of serious adverse events which is in concordance with the experience of any surgeon that treats AAOCA. This is another good reason to further optimize the indications for surgery and to carefully control the results of the operation.

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