LETTERS TO THE EDITOR

Comparison of operator radiation exposure with optimized radiation protection devices during coronary angiograms and ad hoc percutaneous coronary interventions by radial and femoral routes

We read with great interest the article by Brasselet et al.1 The authors reported access site-specific patient and operator radiation exposure in an observational series of 420 patients undergoing diagnostic angiography or percutaneous coronary intervention, concluding that radial access increases radiation exposure. The authors stated that cardiologists should reconsider the use of radial access in the light of these findings. Although the authors should be commended for raising the important issue of radiation protection, their data add nothing new to the existing literature on access site selection and radiation exposure, and their conclusions are invalid for the following reasons.

The authors reported an increase in fluoroscopy time and procedural duration for their radial cases. This suggests that the operators were more skilled in femoral than radial procedures as this pattern does not exist for high-volume radial operators.2 This is consistent with the authors’ own statement that their institution is a low to moderate volume radial centre. The authors’ data indicated that patients undergoing radial procedures had a higher body weight and more complex lesion morphology. Radiographic gantry angulation is another important determinant of operator radiation exposure, and this important factor was not reported on. Increased (and unwarranted) use of LAO (left anterior oblique) cranial views in the radial group could play a major factor in the reported values. The authors reported that conventional catheter configurations were employed in their radial cases. This is suboptimal practice, as the use of dedicated catheter configurations has already been shown to reduce procedural duration and radiation exposure for radial operators.3 Any of the above factors could explain all of the reported variation in access site-specific radiation exposure.

The individual operator data are also a cause for concern when interpreting the results. Operators 1 and 4 recorded similar values for procedural duration, fluoroscopy time, and patient radiation exposure, but Operator 4 recorded a more than two-fold increase in personal exposure compared with Operator 1. This large variation may be due to technical issues with radiation protection practice, and serves to emphasize the enormous impact of individual operator practice on the measurements obtained in this type of observational study.

The existing observational data for radiation exposure and access site practice is flawed and does not allow for any reliable conclusion. It is probable that the reported differences reflect variation in operator experience and attention to radiation protection. In support of this, our own data comparing highly skilled radial and femoral operators with strict control of above-mentioned variables demonstrated no increase in patient or operator exposure in radial cases.4 The present study underlines the need for care with radiation protection, but does not support the authors’ conclusion.

References

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Is the Ross procedure really a Trojan horse?

We have read the article by Klieverik et al.1 regarding ‘The Ross operation: a Trojan horse’ with great interest. By the choice of this title, the authors suggest that the use of the autologous pulmonary valve can be

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utterly devastating. It is understood that the Ross procedure is controversial by itself and the title misleading in consideration of the fact that several authors yielded excellent long-term results.1,2

Modern speculations have described that a horse, the Trojan Horse, was used as a battering ram. The description of the use of a horse was transformed into a myth by later oral historians. It has been suggested that the Trojan Horse actually represents an earthquake that occurred between the wars that could have weakened Troy’s walls. However, the deity, Poseidon, had a three-fold function as god of the sea, of horses, and earthquakes.

Results from several authors suggest that the Ross procedure even is an effective and safe tool to treat patients suffering from rheumatic fever and not as worse as suggested. Kumar et al.1 by performing the Ross procedure in rheumatic patients (n = 81) showed freedom from autograft dysfunction at 78.4 ± 5.2% after a median follow-up of 109 months. Dividing this entire group by age, young rheumatics (<30 years) showed 65.0 ± 7.8% freedom of re-operation compared with 98.5 ± 1.0% for older rheumatics (P = 0.0002). Recurrent rheumatic fever, however, developed in five patients, partially due to inappropriate post-operative application of penicillin. Da Costa et al.5 published results of 202 patients, including 61% young rheumatics. In this trial, freedom from autograft dysfunction was remarkable 96.4% after 10 years. In both studies, the autograft was implanted using the root replacement technique.

It should be recognized, however, that the originally described technique by Ross was the subcoronary implantation, which was abandoned in favour of the root replacement technique. Sievers et al.10 reported excellent long-term results with the subcoronary technique. These data are in consistence with our own experience of more than 460 Ross procedures performed since 1994.

Finally, it should be mentioned that an alternative for this patient population would be conventional mechanical or bioprosthetic valve replacement. Ruel et al.11 in a recent study on 314 patients showed an actuarial freedom from re-operation after 20 years of only 73.0 ± 4.9% for mechanical valves and stented bioprostheses of 11.4 ± 3.5%. On the other hand, survival rates at 25 years follow-up was better for patients with tissue valves (52.3 ± 4.4 vs. 41.2 ± 5.2%).

Thus, the Ross procedure is certainly not free of re-operation; however, considering the outcome and re-operation in traditional prostheses, the Ross procedure still has the lowest re-operation rates even in this unique patient population shown by the authors.

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Is the Ross procedure really a Trojan horse: reply

We thank Dr Dohmen et al. for their critical and culturally enriching letter regarding our paper entitled The Ross procedure: A Trojan Horse? We congratulate the authors with their extensive experience and look forward to the first report on their results with this impressive patient population.

The modern speculations of the Trojan Horse that Dohmen et al. describe in their letter are not the most obvious explanation to the myth. The well-known common myth of the Trojan Horse is the myth of the giant wooden horse, a gift for Pallas Athena. This horse was hollow and contained Greek soldiers who overtook the city of Troy during the Trojan War (http://en.wikipedia.org/wiki/Trojan_War). This myth has become the common metaphor for anything that appears innocent or benign, but actually presents with unpleasant consequences.

The Ross operation is the only aortic valve operation that provides the patient with a living valve substitute, a truly wonderful gift. Yet, there is accumulating evidence that over time the durability of the Ross procedure may be disappointing, as is illustrated in the Trojan horse paper on our own experience. In Rotterdam, we find that the durability of the Ross operation is comparable with other biological valve substitutes.1 However, we do not conclude in our paper that the Ross operation is a Trojan Horse, but critically assess the operation in our own experience. The question mark in the title of our paper is illustrative of this critical assessment.

Dr Dohmen et al. refer to the experience of Dr Kouchoukos et al.2 as being an example of excellent results with the Ross operation. However, Kouchoukos’s paper actually presents the first landmark report of disappointing autograft re-operation rates (75% freedom from autograft reoperation at 10 years). On the other hand, Dr Dohmen et al. are correct that for rheumatic heart valve disease patients in developing countries with limited access to anticoagulation therapy, there is surely a great advantage to the use of the Ross procedure. Also, the employment of the subcoronary implantation technique may, in experienced hands, provide a better autograft durability.

With regard to valve-related complications other than non-structural and structural valve failure,4 the Ross procedure does provide the patient with a superior valve substitute compared with mechanical and biological valve substitutes. The debate remains whether the excellent survival observed in Ross patients can be attributed to the haemodynamically superior valve and low valve-related complication rates, or whether it is due patient selection. We have thus far been unable to prove this.1