Optimal strategy in lead failure

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This editorial refers to ‘Is the use of an additional pace/sense lead the optimal strategy for the avoidance of lead extraction in defibrillation lead failure? A single-centre experience’ by P.A. Scott et al., on page 522.

The older physicians among us surely remember those years when the concern of every implanter was the longevity of the implanted unit. Very little attention was directed to the longevity of the electrode that was implanted at the same time. There was the novelty of being able to use an endocardial lead, as distinct from the epicardial approach which had been the mainstay of earlier pacemaker recipients. The endocardial electrodes were coiled, as distinct from the straight wires of early epicardial models. In addition, implanters were primarily concerned with maintaining stable electrode position, and the reports of 10% electrode repositioning were by no means uncommon. Finally, electrodes were unipolar (and assumed therefore to be strong), and the life expectancy of implanted patients was—incorrectly—assumed to be a few short years. Follow-up information was limited, thresholds and impedance could only be measured at implant, and many electrode failures were buried with the patient whose death they had caused.

Electrodes have now become practically uniformly bipolar, thinner than their predecessors, and the defibrillator electrodes have the double function of pace/sense and shocking. In addition, the patients themselves have been blessed with increased and steadily increasing longevity. Follow-up of pacemaker patients for over 30 years is now commonplace. We now recognize that the electrodes are the potential Achilles heel of every implanted pacemaker and even more so, defibrillator system. Electrode failure has the potential of being a major health problem for the patient and a constant headache for the attending physician.

Failure of the pace/sense function of a defibrillator electrode carries with it the concern that if one part of the electrode has failed, then the whole electrode is suspect. Fortunately, experience has shown that in most scenarios, the pace/sense function failure does not incriminate the total electrode function, and the shocking competence has not (yet) been affected. As this is the case, the management options vary. The first thought to come to mind is to extract the faulty lead and replace it. This would be the ideal way to go, if it were so simple. The faulty lead is out—a new lead is in, and all is well in the world. However, the risk of widespread lead extractions is by no means minimal.1 Although we constantly read reports of lead extractions with very low complication rates, these are invariably from large centres with considerable experience. The thought of every single failed pace/sense defibrillator lead being extracted after years of implantation is to probably create a cure worse than the disease. Experience with the Accufix lead reduced the initial enthusiasm for across the board extraction, to a recommendation for conservative treatment, except in very individual cases. So, if extraction is not a standard option, what is left to consider? A new electrode can be inserted in addition to the old one. Such an approach has the attraction that the electrode is new, supposedly functioning well, with expectations of excellent results in the future. The disadvantage of this approach is the size of the replacement electrode, now added to the old one which is in place, not just in the heart but also in the approach vessels. In a world where cardiac resynchronization therapy and defibrillation is becoming standard, there are already three electrodes in place. Adding a defibrillating electrode may be a bit crowded. There is also the consideration of the possible intra-cardiac contact between the old and new shocking electrodes, leading to ineffective defibrillation attempts by the implanted device (J. Gross, personal communication).

The report by Scott et al.2 describes the results of the compromise solution which is also used by other centres. As the problem is the pace/sense section of the electrode, and the shocking section seems to be unaffected, the solution is to guarantee the pace/sense function by implanting a new electrode dedicated to that function only. There is still the problem of an additional piece of hardware that requires implantation, and venous access is by no means automatic, particularly if years have passed since the initial surgery was performed.3,4 However, the advantages are clear, in that there is no interference with the life-saving shocking function of the defibrillating coil once the new pace/sense lead has enabled the correct diagnosis to be made. The disadvantage of an additional electrode cannot be avoided, but if venous access is achieved, there seem to be very few problems in the follow-up period of 28 months. Until a perfectly functioning electrode is available, or until leads can be extracted with the same ease and safety with
which they can be implanted, the solution of the additional pace/sense lead described in their paper would seem to be the approach of choice.

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**References**


