Oral Anticoagulation and Implantation of Cardiac Rhythm Management Devices: Is Heparin a Bridge Too Far?

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Implantable cardiac rhythm management devices, including pacemakers and implantable cardioverter-defibrillators (ICDs), are finding increasing clinical application. Although up to 45% of these patients receive chronic oral anticoagulation, often warfarin, there is no consensus on how this should be managed at the time of device implantation.1 Due to concerns of hemorrhagic complications whilst on oral anticoagulants, patients are often asked to discontinue oral therapy prior to the surgery and those at moderate to high risk of thromboembolism may receive heparin “bridging” perioperatively.2 The practice of heparin bridging, at least for patients at high thromboembolic risk, is currently recommended by guidelines.3

Heparinization increases patient inconvenience and medical costs and may necessitate hospitalization for many days prior to and after the procedure. Furthermore, there is evidence that heparin bridging increases the risk of clinically significant pocket hematoma even if delayed by 24 hours post-procedure.4,5 On the other hand, early retrospective observational data from 1025 patients demonstrated no difference in the incidence of wound hematomas between patients with an INR of 2.6 and those with a normal INR.6 Other centers subsequently confirmed this observation and additionally suggested a reduced incidence of complications, particularly pocket hematomas, with ongoing warfarin therapy compared to heparin bridging.7,9

A recent prospective trial randomized patients undergoing device implantations to either warfarin continuation or interruption for pacing procedures. Patients at high thromboembolic risk who were randomized to warfarin interruption received a heparin bridge. High-risk patients were considered to be those with atrial fibrillation and a history of thromboembolism, inherited or acquired prothrombotic conditions, tricuspid or mitral mechanical valves, and those being treated for a current thromboembolic event. Patients with atrial fibrillation and low thromboembolic risk score, or those with mechanical valves in the aortic position were considered low-risk. There was no significant difference between the two groups in the combined endpoint of thromboembolic events or significant hemorrhagic complications.10 The results of a further randomized Canadian trial of similar design are eagerly awaited (ClinicalTrials.gov: NCT00800137).

A recent meta-analysis of 13 predominantly observational studies, representing almost 6000 patients, also found that the risk of hemorrhagic events was similar for patients continuing anticoagulation (odds ratio, OR 1.6 compared to patients on no
anticoagulants) and those in whom anticoagulation was withheld for the implantation procedure (OR 1.7). Patients receiving a heparin bridge, however, were at significantly higher risk of bleeding (OR 8.3), leading the authors to conclude that heparin bridging is less safe than continuing oral anticoagulation.

Particular care must be practiced by the implanting physician when operating on anticoagulated patients. Injection of a small amount of radiographic contrast to define the subclavian venous anatomy may be used to avoid “blind” attempts that may injure the subclavian artery. Furthermore, the use of blunt dissection and electrocautery to achieve hemostasis, along with a micropuncture technique with a 21G needle for venous access (Cook Medical®), are germane to minimizing hemorrhagic risk in anticoagulated patients. The superiority of a cephalic vein cut-down technique versus subclavian or axillary vein puncture is unproven, whereas the utility of sterile pressure dressings applied to the wound remains untested.

If the risk of thromboembolism is low or moderate, our approach is to briefly discontinue oral anticoagulation for device implantation. In patients with a high thromboembolic risk, the continuation of oral anticoagulation with meticulous care to achieve intraprocedural hemostasis is preferable to perioperative heparin bridging. For low hemorrhagic risk procedures, such as generator changes or loop recorder implantations, oral anticoagulation may be continued even in patients who are at moderate thromboembolic risk.

In view of these emerging data, we would encourage your readers to critically evaluate their anticoagulation management practices for device implantation procedures.

References