Anticoagulants and Antiplatelet Agents for Lumbar Medial Branch Radiofrequency Neurotomy

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Myth: Therapeutic anticoagulation (AC) and antiplatelet agents (APT) should be discontinued prior to lumbar radiofrequency neurotomy (RFN) due to serious hemorrhagic risks.

Fact: A clinically significant hemorrhagic complication has never been reported in the medical literature in association with a lumbar RFN procedure.

Lumbar RFN is a procedure to treat painful lumbar facet joints. It involves placing an electrode parallel to the medial branch nerve [MBN] where it crosses the neck of the superior articular process. During properly performed procedures [1], the needle and electrode remain entirely extra-spinal confirmed by multiplanar fluoroscopy. At no time does the electrode enter the central spinal canal or intervertebral foramen. The electrode passes through skin, subcutaneous tissue, and muscle along the trajectory to the MBN or L5 dorsal ramus. Therefore, from an anatomical perspective, the primary bleeding complications that could be associated with RFN performed according to technique supported by clinical practice guidelines [1] are paraspinal hematoma or bleeding at the needle puncture site.

No clinically significant hemorrhagic complications occurring during a lumbar RFN have been reported in the current medical literature. Large observational studies [2,3,4] and systematic reviews [5] have reported no bleeding complications associated with lumbar RFN. Endres et al. performed lumbar RFN for 35 patients on AC and 22 patients on APT, none of whom experienced any bleeding complications [2]. A follow-up 2020 study by Endres *et al.* encountered no bleeding complications among 145 patients undergoing lumbar RFN on AC and APT medications. This included 47 patients on warfarin, 56 on clopidogrel, 6 on rivaroxaban, and 46 on apixaban [6]. Ehsanian *et al.* reported no bleeding complications among 18 patients continuing aspirin (n=12), non-steroidal anti-inflammatory drugs (NSAIDs) (n=3), and Cyclooxygenase-2 (COX-2) selective NSAIDs [7]. Although these studies report a zero risk, their sample sizes were small, and do not exclude a risk of up to 3%.

Reports on larger patient cohorts will be needed to accurately define a more accurate (rare or non-existent) incidence of such events. Nonetheless, published evidence of a serious hemorrhagic complication associated with lumbar RFN has yet to emerge.

Myth: The risk of a cardiovascular or cerebrovascular event resulting from temporary discontinuation of AC and APT medications for the purposes of a lumbar RFN procedure is negligible.

Fact: Discontinuing AC or APT agents, even for a short period of time, may lead to an increased incidence of cardiovascular and cerebrovascular events.

There are significant documented medical risks of discontinuing AC agents for spinal interventions [2]. Cardiovascular and cerebrovascular events, including pulmonary embolism, stroke, and myocardial infarction have been reported prior to interventional spine procedures when AC agents are withheld [2,4,8,9]. Bernstein *et al.* reported 15 cases of ischemic events in the peri-procedure period. Of these, nine had stopped AC medication and

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six had continued it [4]. Endres *et al.* reported on 3827 procedures in which anticoagulants were discontinued [6]. Nine patients suffered serious morbidity, including five patients with non-fatal stroke, one with a pulmonary embolism, and one with a myocardial infarction. There were two deaths (one fatal stroke, one fatal myocardial infarction) [6]. The prevalence of these complications was 0.48% (95% CI: 0.2 – 0.9%).

Risk of thrombotic complications due to withholding APT prior to spinal interventions has not yet been clearly established. Risks of cardiovascular or cerebrovascular events due to stopping antithrombotic agents have been estimated to be 0.4% (0.2–0.7%) [2,4]. Though this may be perceived as a relatively small number, the complications are serious and have, in some cases, resulted in death. These figures warn that clinical decisions regarding the cessation of antithrombotic agents need to be balanced with the risk of hemorrhagic complications. A recent Cochrane Review concluded that continuation or discontinuation of APT prior to surgery had little or no effect on outcomes; however, they report absolute effect of 17 fewer participants per 1,000 with an ischemic event in the continuation group [10]. In the case of lumbar RFN, the medical literature suggests that the predicted frequency of a serious thrombotic event (approximately 0.4%) is greater than the risk of a serious hemorrhagic event (yet to be reported).

Recommendations

- Physicians should weigh the relative risk of serious thrombotic versus hemorrhagic complications when making the decision to stop or continue AC or APT medications prior to lumbar RFN.
- Although larger studies are needed to provide a more confident estimate of zero risk of continuing AC or APT prior to lumbar RFN, there is currently no evidence that continuing AC or APT prior to this procedure carries risk of clinically significant bleeding.
- The rate of serious thrombotic complications associated with stopping AC for the appropriate time period prior to spinal intervention is approximately 0.4%.

Conclusion

Current evidence suggests that the risk of cerebrovascular and cardiovascular complications from stopping AC or APT outweighs the risks of serious hemorrhagic complications associated with lumbar RFN.

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