



Editorial

How to deal with peripheral regional anaesthesia while antithrombotics on board?



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An increasing number of patients are receiving antithrombotic agents, including oral anticoagulants (vitamin K antagonist or direct oral anticoagulant (DOAC)) and antiplatelet agents (aspirin or P2Y₁₂ inhibitors). Each year, many of these patients face elective or non-elective invasive procedures requiring potentially regional anaesthesia. However, antithrombotics increase the risk of bleeding and the optimal management of these patients who are candidates to regional anaesthesia is challenging.

Regarding central neuraxial anaesthesia, which includes spinal, epidural (with or without catheters), or combined spinal-epidural techniques, the management of antithrombotic agents is relatively well standardised, although mainly based on expert opinions supported by pharmacokinetic data of these medications and observational studies [1–4]. Spinal haematoma, the feared bleeding complication, is rare but potentially tragic as it may result in permanent paraplegia and urinary and/or rectal incontinence [1,2]. The risk of spinal haematoma related to aspirin seems very low, whereas it is higher with other antithrombotics [1,2]. As a result, according to expert opinion, neuraxial anaesthesia can be performed in patients treated with aspirin if the benefit – risk ratio is favourable, whereas it is contraindicated in patients treated with P2Y₁₂ inhibitors or any anticoagulant, including low molecular weight heparin (LMWH) at thromboprophylactic dose (Fig. 1) [1–4]. Therefore, central neuraxial anaesthesia requires discontinuation of such agents [1–4]. The optimal duration of antithrombotic discontinuation is presented in the Table 1 [3–7]. Experts usually consider that catheter insertion carry similar risks to manipulation and removal, thus the same rules must be applied (Table 1). Hence, the benefit of using epidural analgesia should be carefully balanced in patients with a high thrombotic risk, keeping in mind that perioperative management of antithrombotic agents will be

complex with specific duration of antithrombotic discontinuation preoperatively and potential delayed resumption postoperatively.

Surprisingly, the literature has shown little consensus with respect to the management of antithrombotic agents for peripheral regional anaesthesia. The most relevant complication of peripheral anaesthesia is wound haematoma. Haematoma is associated to significant morbidities exposing to surgical revision for evacuation, transfusion and nerve damage by compression, especially when haematoma occurs in an enclosed and non-compressible space. The risk of haematoma seems to be higher in case of deep punctures, especially in the absence of compression, and in patients treated with antithrombotic agents, especially when antiplatelet and anticoagulant therapies are combined. Nevertheless, the incidence and consequence of haematoma in patients receiving antithrombotic agents has been poorly assessed.

In this context, Joubert *et al.* conducted a systematic review to assess the risk of bleeding complications following peripheral nerve blocks in patients treated with antithrombotic agents [8]. Based on six observational studies including 9688 peripheral nerve blocks in patients receiving antiplatelet and/or anticoagulant medication, the incidence of bleeding complications was 0.67% (0.51%–0.83%). Considering the huge number of peripheral nerve blocks performed each day worldwide, bleeding complications are not anecdotal and require specific attention for both diagnosis and prevention. Joubert *et al.* identified predictors of bleeding events [8]. They found that bleeding complications were mostly related to deep blocks, and that aspirin was poorly associated with bleeding, contrary to P2Y₁₂ inhibitors or anticoagulants. The potential mechanisms that may explain such complications include the inability to perform an efficient compression of the anatomical site, the proximity of a large vessel and the proximity of the spinal cord, for blocks such as paravertebral block. Interestingly, many complications reported by Joubert *et al.* were related to perineural catheters. Bleeding occurred not only at the time of catheter insertion but also upon removal and could affect patients receiving only prophylactic doses of anticoagulants. This finding points out the complexity of perineural catheter management in patients receiving antithrombotic agents. The benefits of perineural catheters are not questionable and include recovery and early mobilisation, particularly for orthopaedic surgery and arthroplasty, extended analgesia for prevention of immediate postoperative pain, but also phantom limb pain after major limb amputation in vascular or trauma surgery. However, they should be balanced with the

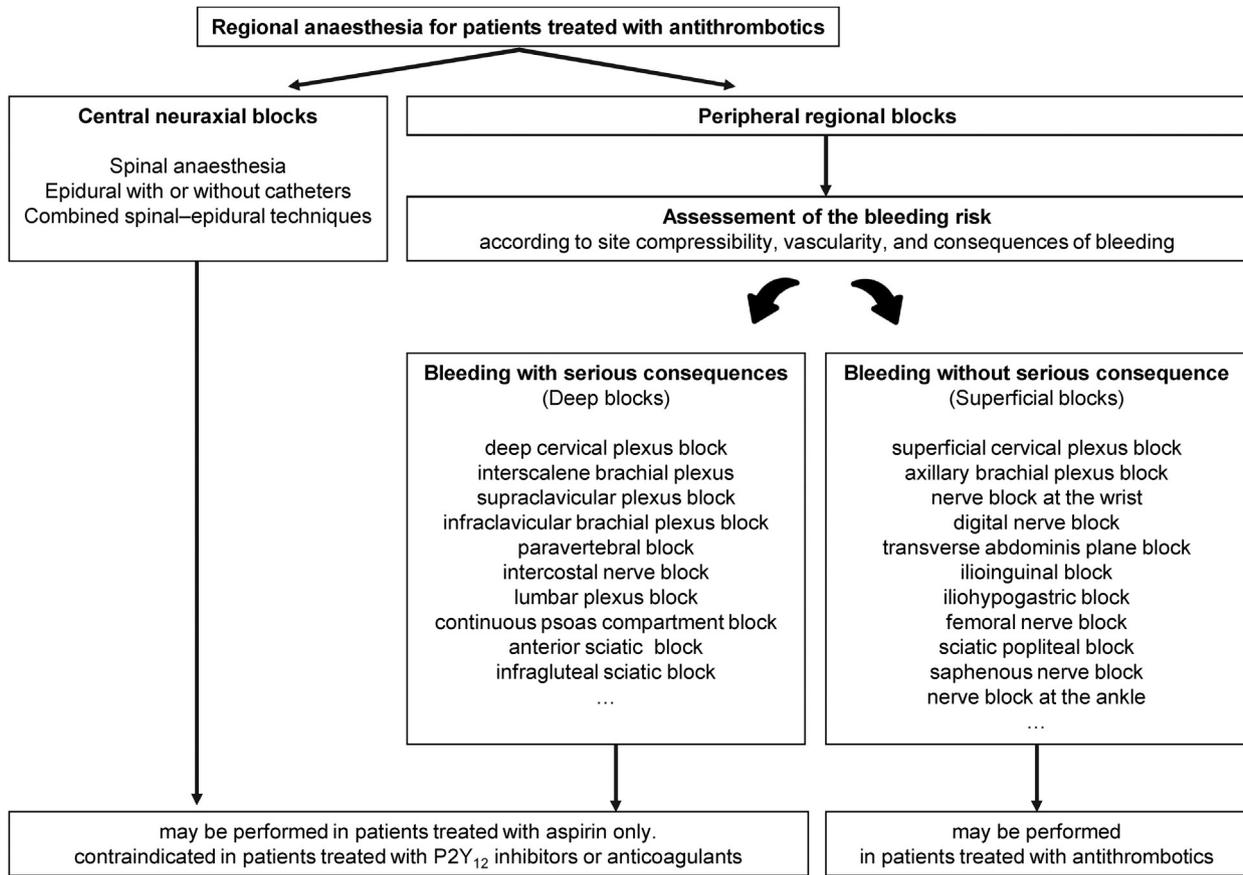


Fig. 1. Regional anaesthesia and patients treated with antithrombotic agents.

Table 1
Proposed time Intervals Before and After Neuraxial Puncture or Catheter Removal [3,4,6,7].

Antithrombotic agent	Last intake before puncture or catheter manipulation or removal	Resumption after puncture or catheter manipulation or removal	Biological threshold for puncture or catheter manipulation or removal
Aspirin	No discontinuation	No discontinuation	NA
P2Y ₁₂ inhibitors	Clopidogrel: 5 days-Ticagrelor: 5 days Prasugrel: 7 days	24 hours	NA
DOAC	5 days	24 hours	[AOD] ≤ 30 ng/mL
VKA	5 days	Day 0 – day 1	INR ≤ 1.5
LMWH (for treatment/bridging)	24 hours	24 hours	Anti-Xa activity ≤ 0.1 UI/mL
LMWH (for prophylaxis)	12 hours	6 hours	Anti-Xa activity ≤ 0.1 UI/mL

DOAC: direct oral anticoagulant; LMWH: low molecular weight heparins; VKA: vitamin K antagonist.

increased bleeding risk induced by antithrombotic agents. Caution should be exercised in removing catheters during thromboprophylaxis, and we would advise to remove catheter far from the peak of anticoagulation.

Ultrasound guidance with or without electrical stimulation reduces the risk of vascular puncture [9]. Guidelines recommend using ultrasound guidance to lower the risk of unintended vascular puncture [10,11]. Nevertheless, ultrasound technique is not infallible since small vessels may not be detected. Specific populations are even more exposed to vessel injuries, such as diabetic patients, or patients in long term treatment with corticoids. For this reason, some blocks, although apparently superficial, are classified as deep blocks and are not recommended in anticoagulant-treated patients, even with ultrasound guidance, such as interscalene brachial plexus [12].

Finally, performing regional anaesthesia in patients receiving antithrombotic agents requires balancing the expected benefit in

terms of both anaesthesia and analgesia, as well as the increased risk of bleeding. The French Working Group on Perioperative Haemostasis (GIHP) published proposals on the management of antiplatelet therapy and anticoagulant agents for regional anaesthesia [3,4]. Nevertheless, evidence is frail. Joubert *et al.* make a substantial contribution regarding assessment of the risk of haematoma associated to peripheral regional anaesthesia [8]. The European Society of Anaesthesiology is preparing updated guidelines regarding regional anaesthesia and antithrombotic agents, which will help to assess the benefit-risk balance of peripheral nerve blocks in complex situations and guide the decision-making process.

Disclosure of interest

A. Godier: Bayer Healthcare, BMS/Pfizer, Boehringer-Ingelheim, Sanofi-Adventis, LFB, CSL- Behring and Octapharma.

S. Bloc declares that he has no competing interest.

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