Regional anaesthesia and anticoagulation

Recommendations of the Hellenic Society of Anaesthesiologists

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The choice of regional anesthesia may offer considerable advantages over general anesthesia for various surgical procedures or for certain patients or in certain settings. Furthermore, a continuous epidural infusion provides the optimum postoperative analgesia, so important for patients with compromised cardio respiratory function. Thromboprophylaxis has an established role in the perioperative period, while increasingly more patients presenting for surgery are already receiving anticoagulants. Performing a neuraxial blockade in these patients, with appropriate adjustments of their anticoagulant treatment, has generally been safe. However, due to the severity of a hematoma within the rigid space of the central nervous system, there is an urgent need for a systematic approach in parallel with the increasingly "mandatory" use of anticoagulants, that, at worst, may have transformed a previously estimated incidence of 1/150000 into a disquieting 1/3600 in certain settings.

The following recommendations are made on expert opinion, after consideration of relevant recommendations of other anesthetic societies and available literature, as there is not any "hard evidence". The risk-benefit balance for a particular patient, in the setting of one's practice, remains to be determined by the team taking care of the patient.

The following is an extended abstract of the recommendations of the Hellenic Society of Anaesthesiologists on "Regional anesthesia and anticoagulation".

Patients that have been administered or may be administered fibrinolytics perioperatively.

- Regional anesthesia should be considered under exceptional circumstances, as there are no data to support any safety time interval for providing a neuraxial blockade after the administration of fibrinolytics.
- If fibrinolytics are administered within 10 days after a regional anesthetic, the patients should be monitored neurologically every 2 hours. The coagulation screen, including fibrinogen, may provide guidance for the removal of a catheter.

Patients on unfractionated heparin.

- prophylactic sc heparin (5000 u/24h): not a contraindication for regional anesthesia, considering:
    - The coagulation tests are within normal limits (check for Heparin Induced Thrombocytopenia),
    - The patient is not receiving other coagulation-altering drugs (e.g. NSAIDs),
    - Puncture or removal of the catheter 4-6 h after the last heparin dose and aPTT normal,
    - Heparin re-administration at least 1 h after puncture or catheter removal,
    - For postoperative analgesia use the lowest effective local anesthetic concentration (probably with opioids), to facilitate neurological monitoring.
- Heparin administration during CPB should direct to catheter placement 12-24 h before surgery, removal when coagulation is normal and frequent neurological monitoring.

Patients receiving LMWH.

- Preoperative administration of LMWH: Neuraxial blockade should be performed after 12 h of administration of thromboprophylaxis doses or 24 h after a therapeutic dose. Do not puncture after 2-4 h of LMWH administration, as during this time the anticoagulant effect is at its maximum.
- Postoperative administration of LMWH.
    - Once-daily dose LMWH:
        - The first dose is administered 6-8 h postoperatively, and the second 24 h after the first.
        - Catheter removal 10-12 h after LMWH administration and 2 h at least before next LMWH administration.
    - Twice-daily dose LMWH:
        - The first dose is administered 24 h postoperatively.
        - Epidural catheters would better be removed on the 1st postoperative day, with the first LMWH dose given at least 2 h after catheter removal.

Warfarin or acenocoumarol.

- As indicated, stop administration of warfarin 5 days preoperatively and substitute with LMWH (either prophylaxis or therapeutic dose, depending on thrombosis risk stratification, e.g. CHADs score, time from pulmonary embolism etc). INR should be < 1.4, with no other coagulation defects. Vitamin K and FFP may prove helpful in more urgent cases. If the patient has received only one dose of warfarin preoperatively (to continue with warfarin postoperatively), check INR before puncture and before catheter removal.
- During continuous epidural analgesia, if the patient receives low doses of warfarin, INR should be kept <1.5.
- Catheter removal when INR<1.5, neurological monitoring for more than 24 h if INR> 1.5 during catheter removal. Definitely postponed if INR>3.

Aspirin – NSAIDs.

- These are not contraindicated strictly on themselves, if no other drugs that may compromise hemostasis are administered and there are no known coagulation defects. Note the irreversible antiplatelet effect of aspirin and the newer compound triflusal (action extends to 7-10 days).
- A spinal approach may be preferable to an epidural with catheter insertion.
- NSAIDs may be administered postoperatively, but consider possible anticlotting interactions with other drugs.

Clopidogrel or ticlodipine (ADP receptor antagonists).

- Neuraxial blockade is contraindicated before 7 days from the discontinuation of clopidogrel and 14 days for ticlodipine.

GPIIb/IIIa receptor antagonists.

Avoid neuraxial blockade, at least for:

- Abciximab: 24-48 h
- Tirofiban, eptifibatide: 8 h.

Hiroudins (lepirudin, desirudin), agratroban.

- Their action may extend up to 3 h after iv administration, but there are no data so that any recommendations may be given. It would seem safe to give a regional anesthetic 24 h after the administration of hiroudins, but check coagulation, as they are mostly used in cases of heparin thrombocytopenia. Allowing 8 h after puncture or removal of a catheter for their administration may be safe.

Ximelagatran or melagatran:

- Their half life of about 3 h may be prolonged in the elderly. Allowing for 12 h after the last dose and checking with INR, should be safe.

Fondaparinaux:

- Administration postoperatively after 6-8 h if puncture was atraumatic.
- Although we would advise for other thromboprophylaxis (until more data are available) with the use of postoperative epidural analgesia, if fondaparinaux is administered, the catheter should be removed 36 h after the last dose and 12 h before the next. In patients with renal insufficiency, allow 42 h after the last dose.

Idraparinux, Dabigatran, Rivaroxaban.

- They are administered postoperatively and there are no data on the safety of regional anesthesia. We would advise for their use at least 12 h after puncture and against concurrent use with an epidural catheter. If a catheter has been left in place, it is probably safer to follow the same recommendation as for fondaparinaux that is 36h after the last dose and 12 h before the next one.

Patients with either bare or drug-eluting stents.

- Stent thrombosis is a major and maybe fatal complication. Data and relevant guidelines are evolving and risk for each individual patient should be discussed with the specialist cardiologist. The time interval from stent placement is of great importance if adjustments to the anticoagulation regimen are allowed.
- A proposed course of action when there is a high risk of thrombosis may be as follows:
    - Aspirin is continued throughout the course

- 5 days preoperatively, discontinue clopidogrel
- 3 days preoperatively, admission to hospital and iv administration of tirofiban and heparin (they are employed preoperatively due to their short half life)
- 6 h preoperatively discontinue heparin and tirofiban
- Administer clopidogrel 600 mg on the 1st postoperative day and 75 mg from the 2nd day onwards.

Patients taking Ginko biloca, Ginseng, garlic:

- There cannot be made special recommendations, although alternative therapies would better be discontinued prior to surgery, particularly if concomitantly using drugs with possible effects on coagulation (e.g. SSRIs).

Peripheral techniques in the operating theatre and in pain management.

Peripheral nerve blockade should probably be considered under the same recommendations. Where vessels are compressible and the space not confined, complications from the formation of a hematoma are not as alarming as within the CNS. However, serious sequelae with peripheral blockade have been reported particularly following psoas-compartment approaches in anticoagulated patients. Other authors with extensive experience contradict these precautions for placing and removal of peripheral catheters, shifting the emphasis on atraumatic technique.

We would favor the approach by Raj et al,[20] who take into consideration elements of both the proposed technique and the patient to formulate an overall bleeding risk estimate. It should be emphasized, that continuous techniques for pain patients (catheters, electrodes) have even more drawbacks than regional anesthesia, as these patients are same day admissions and are dismissed early from the hospital, so it is logistically difficult to adjust their anticoagulation regimen prior to the procedure and offer adequate surveillance afterwards.

In short, the more “central” the blockade, the more caution should be exercised with regard to the technique and the patient profile, towards the same standards as with central neural blockade, either for surgery or for pain management.

References.

1. *ASRA consensus statement, Regional anesthesia in the anticoagulated patient – defining the risks. Reg. Anesth. Pain Med 28: 172-97, 2003*
2. *ASRA anticoagulation and neuraxial regional anesthesia Perpectives . Reg. Anesth. Pain Mar 2004, Supplement Vol 29 N.2*
3. *American Academy of Orthopedic Surgeons 71 st Annual Meeting 2004 Mar 10 –14 San Fr – Calif.*
4. *Narchi P. Best practice and Research Clinical Anaesthesiology Vol 17, No 3, PP 443-449, 2003*
5. *Gogarten W. Newer antithrombotic drugs and neuraxial blocks- a containdication? Highlights in Regional Anaesthesia and Pain Therapy. XXIII annual ESRA Congress Sept 2004 (277).*
6. *Singelyn F. Newer anticoagulants – Is it the end of neuraxial blocks? Highlights in Regional Anaesthesia and Pain Therapy XXIII annual ESRA Congress Sept 2004 (78-84).*
7. *Horlocker TT, Wedel DJ, Benzon H et al. Regional anesthesia in the anticoagulated patient: defining the risks (the second ASRA Consensus Conference on Neuraxial Anesthesia and Anticoagulation). Reg Anesth Pain Med 2003 ;28:172-197.*
8. *Horlocker T. Thromboprophylaxis and Neuraxial Anesthesia Supplements Orthopedics Feb 2003 Vol 26 No 2.*
9. *Hadzic A. Newer anticoagulants and regional anaesthesia. Highlights in Regional Anaesthesia and Pain Therapy. XXIII annual ESRA Congress Sept 2004 (85-91).*
10. *Vandermeulen E. Guidelines on anticoagulants and the use of LR anesthesia. Acta Anaesth. Belg 2001, 52, 425 –429.*
11. *Vandermeulen E. Guidelines on anticoagulants and the use of Locoregional Anesthesia. Minerva Anaesthesiol 2003, 69, 407 –411.*
12. *Aokad M, Baraka : Haemostasis – Altering Drugs and Central Neuraxial block : M. Ej. Anesth 1999, 15, (3) 217-244.*
13. *Heit J.A. Perioperative Management of the Chronically Anticoagulated Patient. 2001 Journal of Thrombosis 12 (1), 81 – 87*
14. *Tyagi A, Bhattachaya A. Central Neuraxial blocks and anticoagulation: a review of current trends EJA 2002, 19 :317 -329.*
15. *Rowlingson JC, Hanson PB. Neuraxial anesthesia and low-molecular-weight heparin prophylaxis in major orthopedic surgery in the wake of the latest American Society of Regional Anesthesia guidelines. Anesth Analg. 2005 May;100(5):1482-8.*
16. *Rodgers A, Walker N, Schug S, et al. Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: results from overview of randomised trials. BMJ 2000;321:1–12.*
17. *Bombeli T, Spahn DR. Updates in perioperative coagulation: physiology and management of thromboembolism and haemorrhage. Br J Anaesth. 2004 Aug;93(2):275-87.*
18. *Wu CL, Rowlingson AJ, Herbert R, Richman JM, Andrews RA, Fleisher LA. Correlation of postoperative epidural analgesia on morbidity and mortality after colectomy in Medicare patients. J Clin Anesth. 2006 Dec;18(8):594-9.*
19. *J. V. Llau, J. De Andre´s, C. Gomar, A. Gomez-Luque, F. Hidalgo, L. M. Torres. Anticlotting drugs and regional anaesthetic and analgesic techniques: comparative update of the safety recommendations. Eur J Anaesthesiol. 2007 May;24(5):387-98.*

20. *P. Prithvi Raj, Rinoo V. Shah, Alan D. Kaye, Stephen Denaro, Jason M. Hoover. Bleeding Risk in Interventional Pain Practice: Assessment, Management, and Review of the Literature. Pain Physician. 2004;7:3-51.*

21. *Weller RS, Gerancher JC, Crews JC et al. Extensive retroperitoneal hematoma without neurological deficit in two patients who underwent lumbar plexus block and were later anticoagulated. Anesthesiology 2003; 98:581-585.*

22. *P Bickler, et al. Bleeding Complications from Femoral and Sciatic Nerve Catheters in Patients Receiving Low Molecular Weight Heparin. Anesth Analg 2006;103:1036 –7.*

23. *R V. Shah, A D. Kaye. Bleeding risk and interventional pain management. Current Opinion in Anesthesiology 2008, 21:433–438*

24. *Rowlingson JC, Hanson PB. Neuraxial anesthesia and low-molecular-weight heparin prophylaxis in major orthopedic surgery in the wake of the latest American Society of Regional Anesthesia guidelines. Anesth Analg. 2005 May;100(5):1482-8.*

25. *Douketis JD et al. The perioperative management of antithrombotic therapy: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines (8th Edition). Chest 2008 July; 133; 299-339.*