

Safety of spinal anaesthesia in patients with recent coronary stents

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Keywords: coronary stent, antiplatelet drugs, chronic obstructive airway disease, pseudoaneurysm

Abstract

Complications relating to spinal anaesthesia following antiplatelet therapy are unclear. We report on a patient with a known history of chronic obstructive airway disease with respiratory tract infection who presented for emergency pseudoaneurysm repair. He underwent recent coronary stent implantation and was treated with clopidogrel and aspirin. Despite dual antiplatelet therapy, spinal anaesthesia was administered safely with prior platelet transfusion. Therefore, regional anaesthesia can be considered in selected patients with prior platelet transfusion on dual antiplatelet drugs when it is deemed to be necessary.

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South Afr J Anaesth Analg 2013;19(2):124-126

Introduction

Anaesthesiologists are increasingly confronted with patients who have undergone a recent coronary artery stent implantation and who are on dual antiplatelet medication. Noncardiac surgery and most invasive procedures increase the risk of stent thrombosis, especially when the procedure is performed early after stent implantation. Dual antiplatelet therapy presents problems for regional anaesthesia. We present a case of a patient who was anticoagulated with clopidogrel and aspirin and who required urgent surgery. Spinal anaesthesia was planned because of the patient's chronic obstructive airway disease and difficult airway situation, despite the increased risk of epidural haematoma secondary to antiplatelet therapy.

Case report

A 44-year-old man presented with a history of swelling and redness in his right groin. Ten days prior, he had undergone cardiac catheterisation for a coronary stent implantation through the right femoral route. His past illness revealed on and off exacerbation of chronic obstructive airway disease (COAD), with a recent onset of lower respiratory tract infection. Furthermore, he had coronary artery disease with angina following moderate physical activity, which had been treated by angioplasty and stent implantation. He had been anticoagulated with clopidogrel (75 mg twice daily) and

aspirin (300 mg daily) since the stent implantation. He had no other medical illness.

On local examination of the right groin, an expansile swelling was visualised, with multiple puncture points over the swelling. The skin over the swelling was oedematous. The swelling extended up to the right middle of his thigh. Urgent ultrasonography of the thigh revealed ill-defined hyperechoic soft tissue swelling that was superficial to the femoral vessels without any distortion in the vessel calibre proximal and distal to the swelling, suggestive of haematoma. The patient was admitted to the intensive care unit (ICU) with continuation of all anticoagulants. The following day, a magnetic resonance angiography revealed pseudoaneurysm of the common femoral artery (Figure 1).

In view of the increasing size of the groin swelling, an urgent exploration of the haematoma and repair of the pseudoaneurysm were planned. Preoperative routine investigations were within normal limits. Coagulation studies revealed the following: prothrombin time 15.9 seconds, international normalised ratio 1.33, platelet count $2.64 \times 10^9/\mu\text{l}$, coagulation time 240 seconds and clot formation time 80 seconds. Surgery was planned under spinal anaesthesia rather than general anaesthesia, despite the antiplatelet therapy because of the patient's COAD with ongoing respiratory tract infection and difficult airway situation (modified Mallampati classification III with a thyromental distance of 5 cm).

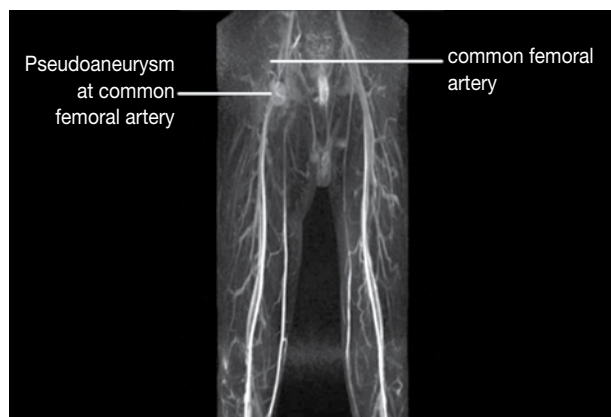


Figure 1: Magnetic resonance angiography showing pseudoaneurysm arising from the common femoral artery on the right side

The patient was taken to the operation theatre and insertion of a large-bore intravenous line and left radial artery cannulation were carried out under local anaesthesia. Two units of pooled platelet concentrate (each one containing approximately 2×10^9 platelets) were infused. The post-transfusion platelet count increased by $3 \times 10^3/\mu\text{l}$. Coagulation time and clot formation time shortened to 110 seconds and 30 seconds respectively. Spinal anaesthesia was administered at lumbar 4-5 interspace, using a 25 G needle in a single attempt. Fifteen milligrams (3 ml) hyperbaric bupivacaine with morphine $5 \mu\text{g}/\text{kg}$ produced anaesthesia extending up to thoracic-10 dermatome. The surgery was performed safely.

Postoperatively, the patient was kept in the ICU for monitoring. There was no evidence of subsequent epidural haematoma, such as neurological deficits and back pain.

Discussion

Coronary stents are placed in up to 90% of all percutaneous coronary interventions¹ because they increase procedural success and decrease restenosis.² Approximately 5% of these patients will present for noncardiac surgery within the first 12 months after stenting.³ Anaesthetists are faced with the perioperative dilemma of managing patients on dual antiplatelet therapy: either stop the drugs and risk life-threatening stent thrombosis, or continue therapy and risk potentially disastrous bleeding. Although heparin therapy is often used perioperatively for thromboembolic prophylaxis, it does not have antiplatelet properties and is not protective against stent thrombosis.⁴ Further, "heparin rebound" occurs after abrupt cessation of an unfractionated heparin infusion.⁵ Vicenzi et al describe an association between perioperative heparin therapy and increased cardiac morbidity and mortality among patients with coronary stents.⁶

Dual antiplatelet therapy presents problems for regional anaesthesia. The placement of a neuraxial block in patients

on dual antiplatelet therapy cannot be recommended unless platelet function is within acceptable limits, or platelet transfusion is given before the operation.⁷ The 2003 guideline produced by the American Society of Regional Anaesthesia (ASRA) is that without prior platelet transfusion, clopidogrel should be stopped for a minimum of seven days, and ticlopidine for a minimum of 14 days.⁸

According to ASRA, treatment with nonsteroidal anti-inflammatory drugs, such as aspirin, alone, is not a contraindication to neuraxial anaesthesia. The German Society for Anaesthesiology and Intensive Care Medicine recommends an interval of three days between aspirin application and spinal anaesthesia, but a consensus statement on neuraxial blockade and thienopyridine therapy has not been presented.⁹ Thus, no guidelines exist for the administration of a central neural blockade in patients receiving combination antiplatelet therapy, although dual application of clopidogrel and aspirin significantly increases bleeding time.¹⁰ The impact of aspirin on surgical bleeding has primarily been studied in cardiac and vascular surgery.¹¹ The likelihood of increased bleeding and/or an increased requirement for blood transfusion in patients undergoing major noncardiac surgery while taking clopidogrel has largely been inferred from the cardiac surgical literature, which contains conflicting data.¹²

Evidence regarding the safety of spinal/epidural anaesthesia in patients on clopidogrel is also scarce, but most anaesthetists will not perform a spinal anaesthetic within seven days of the last dose of clopidogrel because of the risk of spinal haematoma.¹³ In fact, a case of spinal subarachnoid haematoma after epidural anaesthesia in a patient receiving the platelet aggregation inhibitor ticlopidine has been reported.¹⁴

Nevertheless, co-existing disease may make a spinal or epidural technique preferable, as in our patient with severe pulmonary disease. Thus, temporary improvement of platelet function is desirable. This led us to monitor the effects of platelet transfusion with all the available tests. Based on current available information, the decision to perform regional anaesthesia should be made case by case, with consideration given to all potential complications. The anaesthetist has to choose between keeping the protective effect of clopidogrel and proceeding with general anaesthesia, or stopping it for at least seven days before the operation to perform a neuraxial block and benefit from its sympatholytic and analgesic effects.

If the surgery involves a high risk of haemorrhage, or if a regional neuraxial blockade is thought to be essential, it may be necessary to give a platelet transfusion before surgery.

In 2003, the French Health Products Safety Agency reviewed the issue of perioperative platelet transfusion and made the

following recommendations:^{15,16}

- For commonly practised invasive procedures, transfuse to achieve a platelet count of > 50 000 µl/l.
- In the absence of platelet dysfunction, for surgery with a standard haemorrhagic risk, ensure a platelet count > 50 000 µl/l.
- For neurosurgery and ophthalmic surgery involving the posterior segment of the eye, a platelet count of > 100 000 µl/l is required.
- For neuraxial regional anaesthesia, a platelet count of 50 000 µl/l is sufficient for spinal anaesthesia, with 80 000 µl/l proposed for epidurals.

The plasma half-life of clopidogrel is short, so inhibition of transfused platelets should not be a clinically relevant issue. Clopidogrel therapy only results in a maximum of 40–60% inhibition of aggregation.¹⁷ Each unit of platelet concentrate is known to raise the platelet count by a minimum of 5 000 µl/l under normal circumstances. However, some experts believe the above transfusion thresholds are too high.¹⁸ There is a case report of uneventful spinal anaesthesia after two-unit platelet transfusion in a patient taking clopidogrel and aspirin who required urgent surgery. The rise in the platelet count was documented as 24 000 µl/l, as in our case.¹⁹

In conclusion, spinal anaesthesia was performed safely for emergency surgical procedures following platelet transfusion in a patient on a dual antiplatelet drug. Platelet transfusion is a reasonable way to improve coagulation function quickly in selected patients on antiplatelet drugs who require central neuraxial blockade.

References

1. Metzler H, Kozek-Langenecker S, Huber K. Antiplatelet therapy and coronary stents in perioperative medicine: the two sides of the coin. *Best Pract Res Clin Anaesthesiol.* 2008;22(1):81-94.
2. Brilakis ES, Banerjee S, Berger P. Perioperative management of patients with coronary stents. *J Am Coll Cardiol.* 2007;49(22):2145-2150.
3. Chassot P, Delabays A, Spahn DR. Perioperative use of anti-platelet drugs. *Best Pract Res Clin Anaesthesiol.* 2007;21(2):241-256.
4. Collet JP, Montalescot G. Premature withdrawal and alternative therapies to dual oral antiplatelet therapy. *Eur Heart J Suppl.* 2006;8(Suppl):G46-G52.
5. Theroux P, Waters D, Lam J, et al. Reactivation of unstable angina after the discontinuation of heparin. *N Engl J Med.* 1992;327(3):141-145.
6. Vicenzi MN, Meislitzer T, Heitzinger B, et al. Coronary artery stenting and non-cardiac surgery: a prospective outcome study. *Br J Anaesth.* 2006;96(6):686-693.
7. Kiran U, Makhija N. Patient with recent coronary artery stent requiring major non cardiac surgery. *Ind J Anaesth.* 2009;53(5):582-591.
8. Harlocker TT, Wedel DJ, Benzon H, et al. Regional anesthesia in the anticoagulated patient: Defining the risk (The second ASRA Consensus Conference on Neuraxial Anesthesia and Anticoagulation). *Reg Anesth Pain Med.* 2003;28(3):172-197.
9. Gogarten W, VanAken H, Wulf H, et al. Para-spinal regional anesthesia and prevention of thromboembolism / anticoagulation. Recommendations of the German Society of Anesthesiology and Intensive Care Medicine. *Anesthesiologie, Intensivmedizin, Notfallmedizin, Schmerztherapie: AINS.* 1997;38:623-628.
10. Payne DA, Hayes PD, Jones CI, Belham P, et al. Combined therapy with clopidogrel and aspirin significantly increases the bleeding time through a synergistic antiplatelet action. *J Vasc Surg.* 2002;35(6):1204-1209.
11. Burger W, Chemnitz JM, Kneissl GD, Rucker G. Low-dose aspirin for secondary cardiovascular prevention: cardiovascular risks after its perioperative withdrawal versus bleeding risks with its continuation: review and meta-analysis. *J Intern Med.* 2005;257(5):399-414.
12. Grines CL, Bonow RO, Casey DE Jr, et al. Prevention of premature discontinuation of dual antiplatelet therapy in patients with coronary artery stents: a science advisory from the American Heart Association, American College of Cardiology, Society for Cardiovascular Angiography and Interventions, American College of Surgeons, and American Dental Association, with representation from the American College of Physicians. *Circulation.* 2007;115(6):813-818.
13. Harlocker 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(3):172-197.
14. Mayumi T, Dohi S. Spinal subarachnoid hematoma after lumbar puncture in a patient receiving antiplatelet therapy. *Anesth Analg.* 1983;62(8):777-779.
15. Samama CM, Djoudi R, Lecompte T, et al. Perioperative platelet transfusion: Recommendations of the Agence Francaise de Securite Sanitaire des Produits de Sante (AFSSaPS) 2003. *Can J Anaesth.* 2005;52(1):30-37.
16. Samama CM, Djoudi R, Lecompte T, et al. Perioperative platelet transfusion. Recommendations of the French Health Products Safety Agency (AFSSAPS) 2003. *Minerva Anesthesiol.* 2006;72(6):447-452.
17. Harder S, Klinkhardt U, Alvarez JM. Avoidance of bleeding during surgery in patients receiving anticoagulant and/or antiplatelet therapy: pharmacokinetic and pharmacodynamic considerations. *Clin Pharmacokinet.* 2004;43(14):963-981.
18. Heal JM, Blumberg N. Optimizing platelet transfusion therapy. *Blood Rev.* 2004;18(3):149-165.
19. Herbstreit F, Peters J. Spinal anaesthesia despite combined clopidogrel and aspirin therapy in a patient awaiting lung transplantation: effects of platelet transfusion on clotting tests. *Anaesthesia.* 2005;60(1):85-87.