

## Ultrasound-guided peripheral nerve blocks for a patient receiving four kinds of anticoagulant and antiplatelet drugs: a case report

Hideki Taninishi · Kiyoshi Morita

Received: 17 July 2010 / Accepted: 4 January 2011 / Published online: 2 February 2011  
© Japanese Society of Anesthesiologists 2011

**Keywords** Ultrasound-guided regional anesthesia · Drug-eluting stent · Antiplatelet therapy

To the Editor:

A 64-year-old man was scheduled to undergo right foot amputation because of necrosis caused by obstructive arteriosclerosis. He had undergone coronary arterial bypass grafting 5 years previously and had undergone implantation of a Cypher stent into the left main coronary artery and a device for cardiac resynchronization therapy 3 years previously. Echocardiography showed that the ejection fraction of his left ventricle was 18%. His right coronary branch and left anterior descending branch were completely occluded and these areas were perfused only by coronary bypass graft flow. Warfarin, cilostazol, ticlopidine, and acetylsalicylic acid were administered to maintain his coronary arterial patency. He had also been receiving hemodialysis because of diabetic nephropathy.

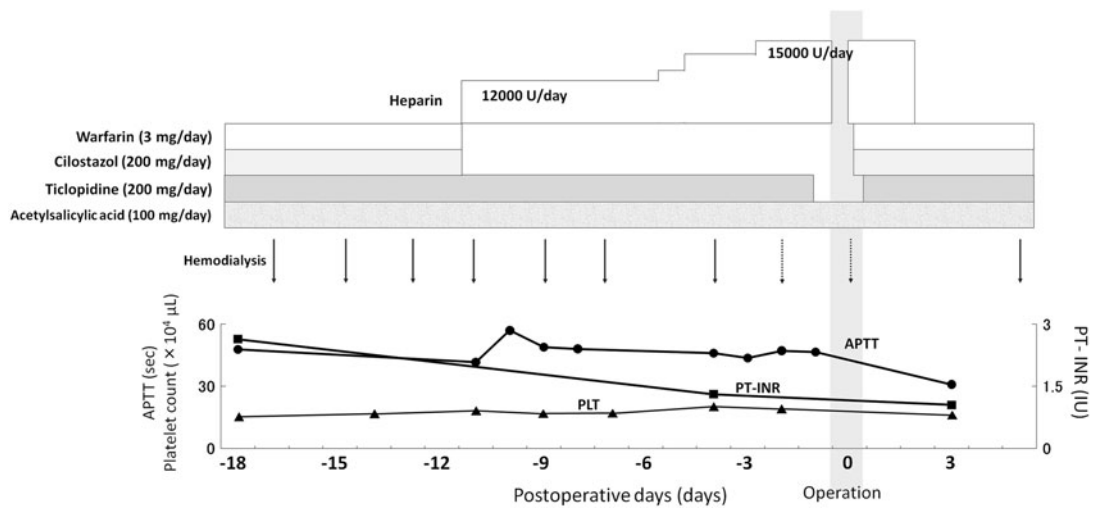
Administration of cilostazol was stopped and administration of warfarin changed to continuous intravenous infusion of heparin (12000 units per day). Administration of ticlopidine was stopped and administration of acetylsalicylic acid was continued on the day of the surgery (Fig. 1). Intravenous infusion of heparin was stopped at the time our patient entered the operation room. Peripheral nerve blocks were applied for anesthesia. By ultrasound-guidance, popliteal block and femoral nerve block were

performed in that order (Fig. 2a, c). Each block was performed by the out-of plane method, and spread of local anesthetics above and below the nerves was confirmed by placing an ultrasound probe parallel to the nerves (Fig. 2b, d). No hemorrhagic complication appeared in the region of the block needle insertion throughout the perioperative period.

No consensus has yet been established regarding the indication of superficial peripheral nerve block for patients receiving anticoagulant and antiplatelet drugs [1], and there are several case reports of peripheral nerve block being performed in patients receiving heparin [2, 3]. The current case is the first report of peripheral nerve blocks being safely performed in a patient receiving more than two anticoagulant and antiplatelet drugs during the perioperative period. Left ventricular function of our patient was poor and he had been dehydrated because of his hemodialysis state. Our assessment was that general anesthesia should be avoided because decrease in blood pressure and subsequent hydration during induction of general anesthesia would lead to irreversible ischemic or congestive heart failure. Therefore, peripheral nerve block was the first choice despite the fact that administration of antiplatelet drugs could not be discontinued in our patient because of implantation of a Cypher stent [4]. Anticoagulant effect of heparin and irreversible inhibition of platelet aggregation of ticlopidine and acetylsalicylic acid were continued on the day of the operation. Ultrasound-guided peripheral nerve blocks have some advantages over the blind or nerve stimulation method, and the rate of vascular puncture during peripheral nerve blocks with ultrasound is lower than that without ultrasound [5]. In our case, the out-of plane method was used because the short distance from the skin to nerves might reduce the risk of accidental vascular puncture. Real-time visibility and confirmation of the

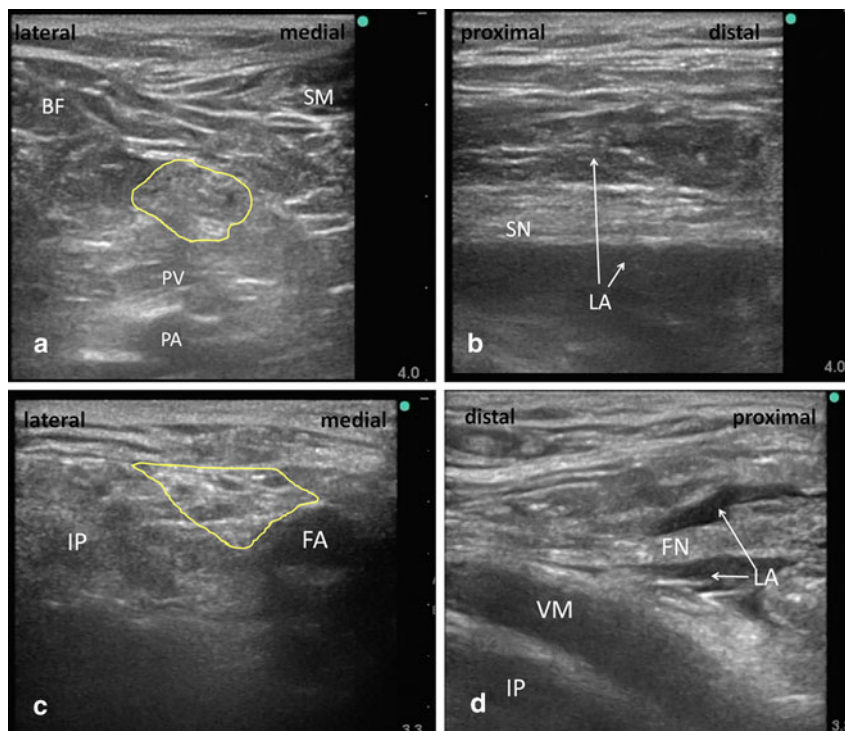
---

H. Taninishi (✉) · K. Morita  
Department of Anesthesiology and Resuscitology,  
Okayama University Graduate School of Medicine,  
Dentistry and Pharmaceutical Sciences,  
2-5-1, Shikata-cho, Kita-ku, Okayama 700-8558, Japan  
e-mail: tanishi@ops.dti.ne.jp



**Fig. 1** Strategy of anticoagulant and antiplatelet therapy during the perioperative period. Administration of warfarin and cilostazol was changed to continuous intravenous infusion of heparin (12000 units per day) 11 days before the operation. Intravenous infusion of heparin was increased to 15000 units per day because the target value of activated partial thromboplastin time was 50 s. Anticoagulant during hemodialysis was changed from heparin to nafamostat mesilate

2 days before and on the day of the operation (*dashed arrows*). Administration of all anticoagulant and antiplatelet drugs was restarted immediately after the operation and intravenous infusion of heparin was terminated 2 days after the operation. *APTT* activated partial thromboplastin time, *PT-INR* prothrombin time-international normalized ratio, *PLT* platelet count



**Fig. 2** **a** Ultrasound view before the popliteal block (area surrounding sciatic nerve). **b** Ultrasound view after the popliteal block which was performed with 20 ml 1.5% lidocaine and 20 ml 0.5% ropivacaine in the prone position. Spread of local anesthetic above and below the sciatic nerve was shown by placing the ultrasound probe parallel to the nerve (*arrows*). **c** Ultrasound view before the femoral nerve block (area surrounding femoral nerve). **d** Ultrasound view after the femoral nerve block which was performed with 10 ml 1%

lidocaine and 10 ml 0.375% ropivacaine in the supine position. Spread of local anesthetic above and below the femoral nerve was shown by placing the ultrasound probe parallel to the nerve (*arrows*). *BF* biceps femoris muscle, *SM* semitendinosus muscle, *PV* popliteal vein, *PA* popliteal artery, *SN* sciatic nerve, *FA* femoral artery, *IP* iliopsoas muscle, *FN* femoral nerve, *VM* vastus medialis muscle, *LA* local anesthetics

spread of local anesthetics by use of ultrasound guidance were helpful for safe and reliable nerve blocks for a patient with bleeding diathesis.

## References

1. Horlocker TT, Wedel DJ, Rowlingson JC, Enneking FK, Kopp SL, Benzon HT, Brown DL, Heit JA, Mulroy MF, Rosenquist RW, Tryba M, Yuan CS. Regional anesthesia in the patient receiving antithrombotic or thrombolytic therapy (American society of regional anesthesia and pain medicine evidence-based guidelines, 3rd edn). *Reg Anesth Pain Med*. 2010;35:64–101.
2. Buckenmaier CC 3rd, Shields CH, Auton AA, Evans SL, Croll SM, Bleckner LL, Brown DS, Stojadinovic A. Continuous peripheral nerve block in combat casualties receiving low-molecular weight heparin. *Br J Anaesth*. 2006;97:874–7.
3. Bigeleisen PE. Ultrasound-guided infraclavicular block in an anticoagulated and anesthetized patient. *Anesth Analg*. 2007;104:1285–7.
4. Chhatriwalla AK, Bhatt DL. Should dual antiplatelet therapy after drug-eluting stents be continued for more than 1 year? Dual antiplatelet therapy after drug-eluting stents should be continued for more than one year and preferably indefinitely. *Circ Cardiovasc Intervent*. 2008;1:217–25.
5. Abrahams MS, Aziz MF, Fu RF, Horn JL. Ultrasound guidance compared with electrical neurostimulation for peripheral nerve block: a systematic review and meta-analysis of randomized controlled trials. *Br J Anaesth*. 2009;102:408–17.