Warfarin

Warfarin, a synthetic derivative of coumarin, is the most widely used oral anticoagulant in the US.

Oral anticoagulant warfarin is the standard of care for patients requiring long-term anticoagulation due to venous thromboembolic disease.

The most commonly used anticoagulants in clinical practice, warfarin and the heparin series of anticoagulants and fondaparinux, act to inhibit the action of Factor Xa in various degrees.

Warfarin-associated intracranial hemorrhage is associated with a high mortality rate. Ongoing coagulopathy increases the likelihood of hematoma expansion and can result in catastrophic hemorrhage if surgery is performed without reversal. The current standard of care for emergency reversal of warfarin is with fresh frozen plasma (FFP).

In April 2013, the USA Food and Drug Administration approved a new reversal agent, 4-factor prothrombin complex concentrate (PCC), which has the potential to more rapidly correct coagulopathy.

In Chinese patients with atrial fibrillation, the benefits of warfarin therapy for stroke prevention and intracranial hemorrhage (ICH) risk are closely dependent on the quality of anticoagulation, as reflected by time in therapeutic range (TTR). Even at the top TTR quartile, warfarin was associated with a higher stroke and ICH risk than dabigatran.

The individual bleeding risk is likely minimized by the administration of reduced doses of Low-molecular-weight heparin (LMWH) relatively late after craniotomy and by delaying the start of warfarin after surgery [1)]

Warfarin resumption

Gonugunta et al., suggest recommencing warfarin 3 weeks after surgical evacuation of CSDH in anticoagulated patients [2)].

In subacute or chronic subdural hematoma, three days after surgery, warfarin was re-administered to reach the target INR range of 1.7-2.5. Patients were followed by regular INR monitoring and serial brain CT scans, which were performed at 1 week, and at 1, 3, and 6 months after surgery. The primary outcome was recurrent SDH incidence. Twenty patients were enrolled and CT scans performed at 1 week revealed no new intracranial hemorrhage in any patient. Subsequent scans were performed at 1 month on 19 patients, and recurrent SDH was observed in three. However, this recurrence rate (15.8%; 95% CI 0,34) did not exceed that of ordinary SDHs, and all recurrent SDHs were successfully managed by repeated burr hole drainage. The other 16 patients completed their 6-month follow-ups uneventfully. SDH recurrence was found to be associated with older age (≥ 75 years), and a thicker SDH (≥ 25 mm), but not with post-operative anticoagulation status. None of the study subjects experienced a thromboembolic event during the study period. Restarting warfarin therapy does not need to be withheld for more than 3 days after burr hole drainage, particularly in patients with a high thromboembolic risk [3)].

1)
Niemi T, Silvasti-Lundell M, Armstrong E, Hernesniemi J. The Janus face of thromboprophylaxis in

patients with high risk for both thrombosis and bleeding during intracranial surgery: report of five exemplary cases. Acta Neurochir (Wien). 2009 Oct;151(10):1289-94. doi: 10.1007/s00701-009-0419-x. Epub 2009 Jun 10. PubMed PMID: 19513580.

2) Gonugunta V, Buxton N. Warfarin and chronic subdural haematomas. Br J Neurosurg. 2001 Dec;15(6):514-7. PubMed PMID: 11814005.

3) Yeon JY, Kong DS, Hong SC. Safety of early warfarin resumption following burr hole drainage for warfarin-associated subacute or chronic subdural hemorrhage. J Neurotrauma. 2012 May 1;29(7):1334-41. doi: 10.1089/neu.2011.2074. Epub 2012 Jan 26. PubMed PMID: 22026446.