

or who died at ≤ 6 months of their initial VTE. Included patients were monitored with clinical examination at 3, 6, and 12 months and annually for at least 5 years. Patients with proximal DVT were anticoagulated for at least 6 months. Those with calf DVT were anticoagulated for 3 months or were monitored with ultrasound imaging for 3 weeks. If the calf DVT progressed, the patients were anticoagulated; if it did not, they remained on compression stockings and aspirin or nonsteroidal anti-inflammatory drugs. Patients underwent duplex ultrasound imaging at least twice in the first year and at any time when there were symptoms suggestive of recurrent VTE. Duplex examinations were also performed at 5 years and anytime later for those with longer follow-up. DVT recurrence was defined as thrombus in a new location from the original DVT when the extent of thrombus at the follow up examination was >9 cm, when a previously recanalized segment subsequently exhibited non-compressibility, and when thrombus thickness was >2 mm for distal veins and >4 mm for proximal veins. This prospective observational study enrolled 153 consecutive patients. Location and extent of the initial DVT, PE, recurrent VTE, causes of mortality, signs and symptoms of post-thrombotic syndrome, and risk factors of VTE were recorded.

Recurrent VTE occurred in 26.1% by 5 years. Patients who had both proximal and distal DVT had similar recurrence rates compared with those patients with proximal DVT alone (17 of 48 [35%] vs 12 of 49 [24%], $P = .27$). There appeared to be a trend toward higher recurrence rates in patients with proximal and distal DVT than those with calf DVT alone ($P = .08$). A higher recurrence was associated with unprovoked DVT (relative risk [RR], 2.9; 95% confidence interval [CI], 1.5-5.7; $P < .01$) and age >65 years (RR, 1.5; 95% CI, 1-2.3; $P = .025$). There was no demonstrated increased risk of recurrence with thrombophilia ($P = .21$). There was low recurrence in patients with DVT associated with surgery or trauma ($P < .001$). Increased severity of post thrombotic syndrome was associated with ipsilateral recurrence (RR, 1.6; 95% CI, 1.4-2.2; $P < .001$). PE was diagnosed 47 times, and 12 of 47 (25%) incidences of PE were fatal.

Comment: The study has severe limitations due to sample size. The number of patients is too small to provide meaningful subgroup analysis. The number of patients ultimately dying of PE is a bit shocking, but perhaps what is most interesting in this field is the increasing frequency of reports contradicting the widely held belief that thrombophilia is a risk factor for recurrence of VTE. Clearly, as in this study, many patients with thrombophilia have other risk factors for VTE that make it difficult to independently assess the impact of thrombophilia on VTE recurrence. Despite the results here, until larger and better studies have examined the impact of thrombophilia on VTE recurrence, it may be best to still consider thrombophilia as a risk factor for recurrent VTE.

Relation Between Preoperative and Intraoperative New Wall Motion Abnormalities in Vascular Surgery Patients: A Transesophageal Echocardiographic Study

Galal W, Hoeks SE, Flu WJ, et al. *Anesthesiology* 2010;112:557-66.

Conclusion: There is a poor correlation between new wall motion abnormalities (NWMAs) observed intraoperatively using transesophageal echocardiography (TEE) and preoperative stress-induced NWMAs assessed by dobutamine echocardiography.

Summary: Intraoperative TEE can detect regional wall motion abnormalities in patients undergoing major noncardiac surgery. However, it is unclear whether NWMAs detected intraoperatively with TEE actually correlate with abnormalities detected preoperatively with noninvasive stress testing. The authors sought to determine whether wall motion abnormalities identified with dobutamine echocardiography correlate with those observed intraoperatively with TEE.

Fifty-four patients undergoing major vascular surgery underwent preoperative dobutamine echocardiography and intraoperative TEE. A seven-wall model scoring system was used to determine the locations of left ventricular rest wall motion abnormalities and NWMAs discovered with preoperative stress testing or with intraoperative TEE. Postoperative cardiac troponin levels, myocardial infarction, and cardiac death were noted during a 30-day follow-up. Wall motion abnormalities at rest were detected by dobutamine echocardiography in 17 patients (31%). TEE noted NWMAs in 16 patients (30%). NWMAs were induced with dobutamine in 17 patients (31%). NWMAs were observed by TEE in 23 patients (43%, $\kappa = 0.65$). There was excellent agreement between preoperative and intraoperative rest wall motion abnormalities ($\kappa = 0.92$); however, agreement for preoperative and intraoperative new wall motion abnormalities in different locations was poor ($\kappa = 0.26-0.44$). A composite cardiac end point of increased troponin levels, myocardial infarction, or cardiac death occurred in 15 patients (26%), of whom 10 patients (67%) experienced both preoperative and intraoperative NWMAs. Only intraoperative NWMAs were observed in four (27%). In the six patients who experienced a postoperative myocardial infarction, the location of the electrocardiographic changes correlated with intraoperatively observed NWMAs by TEE.

Comment: In this series there were no cardiac deaths or postoperative myocardial infarctions in patients without intraoperative NWMAs. Because reproducibility of wall motion abnormalities at different perioperative times

was not achievable in this study, the suggestion is that optimized medical therapy remains superior over invasive interventions focused on preoperative detection of culprit lesions. The data indicate patients with intraoperative NWMAs detected by TEE are perhaps the highest risk group for perioperatively significant cardiac events. Such patients demand perhaps the most assiduous perioperative management of cardiac parameters.

Risk Factors and Outcome of New-Onset Cardiac Arrhythmias in Vascular Surgery Patients

Winkle TA, Schouten O, Hoeks SE, et al. *Am Heart J* 2010;159:1108-15.

Conclusion: Perioperative arrhythmias are common after vascular surgeries. Elderly patients and those with reduced left ventricular function are particularly prone to postoperative arrhythmias.

Summary: Cardiac arrhythmia occurring postoperatively can be seen in up to 20% of patients undergoing noncardiac surgery (Brathwaite D, et al, *Chest* 1998;114:462-8 and Walsh SR et al, *Ann R Coll Surg Engl* 2007;89:91-5). The risk of cardiovascular events is especially elevated in noncardiac vascular surgical patients (Schouten O et al, *Eur Heart J* 2008;29:283-4). Many events are asymptomatic and often transient and unpredictable, suggesting the true prevalence may be underestimated. The current study focused on vascular surgical patients and was designed to determine the true prevalence of cardiac arrhythmias in this population, identify operative risk factors leading to new-onset cardiac arrhythmias, and assess the impact of these new arrhythmias on postoperative outcome.

The study included 515 vascular surgical patients without a history of arrhythmia. Assessed were left ventricular function (LVF), determined by N-terminal pro-B-type natriuretic peptide levels and echocardiography, inflammatory status, and cardiac risk factors. New onset arrhythmias and ischemia were identified with 72-hour continuous electrocardiographic recordings. Patients were evaluated for atrial fibrillation, sustained ventricular tachycardia, supraventricular tachycardia, and ventricular fibrillation. There was a new onset of arrhythmia in 55 patients (11%), including atrial fibrillation in 4%, ventricular tachycardia in 7%, supraventricular tachycardia in 1%, and ventricular fibrillation in 0.2%. Arrhythmia was preceded by ischemia in 10 of 55 patients. Reduced LVF and increased age were risk factors for development of arrhythmia. Multivariate analysis indicated that perioperative arrhythmias were associated with long-term cardiovascular events independent of perioperative ischemia (hazard ratio, 2.2; 95% confidence interval, 1.3-3.8; $P = .004$).

Comment: More than 30 years ago, Goldman published a prospective series of patients undergoing major noncardiac surgery, and only 4% developed postoperative supraventricular arrhythmias (Goldman L, *Chest* 1978;73:450-4). One conclusion was that postoperative supraventricular arrhythmias were often transient, and the most important thing was to correct the cause of the arrhythmia. The number of each type of arrhythmia occurring in this study did not permit meaningful subset analysis. The association of arrhythmias with older age and preoperatively decreased LVF is not all that surprising. Currently, many vascular surgical patients are routinely subjected to telemetry monitoring. Given the number of arrhythmias identified in this study, the current data may question the use of such a blanket policy for patients without known preoperative left ventricular dysfunction.

The Phosphodiesterase Inhibitor Cilostazol Induces Regression of Carotid Atherosclerosis in Subjects With Type 2 Diabetes Mellitus Principal Results of the Diabetic Atherosclerosis Prevention by Cilostazol (DAPC) Study: A Randomized Trial

Katakami N, Kim Y-S, Kawamori R, et al. *Circulation* 2010;121:2584-91.

Conclusion: Cilostazol provides greater inhibition of progression of carotid intima-medial thickness than aspirin in patients with type 2 diabetes mellitus.

Summary: It appears patients with diabetes without previous myocardial infarction have as high a risk of myocardial infarction as patients without diabetes and previous myocardial infarction (Haffner SM, et al, *N Engl J Med* 1998;339:229-34). On the basis of this, some have advocated that primary prevention in patients with diabetes may be indicated. Guidelines suggest that individuals with risk factors for coronary heart disease, such as diabetes mellitus, should take aspirin for primary and secondary prevention, although the ability of aspirin to effectively serve as a primary preventive agent is controversial (American Diabetes Association, *Diabetes Care* 2007;30:s4-41). There has been some suggestion that cilostazol may be effective in preventing cardiovascular events in patients with type 2 diabetes mellitus (Shinohara Y, et al, *Cerebrovasc Dis* 2008;26:63-70). This study therefore compared the ability of two antiplatelet agents, aspirin and cilostazol, to prevent progression of carotid intima-media thickness. This was a prospective, randomized, open, blinded end point study conducted in four East Asian countries. The study enrolled 329 type 2 diabetic patients suspected of peripheral arterial disease (PAD). Patients were eligible if they were aged 40 to 85 years at the time of enrollment and were suspected of PAD on the basis of an ankle-brachial index <1.0 , poor pulses, or clinical symptoms of PAD. Patients were allocated to receive aspirin (81-100 mg/d) or cilostazol