eparin is commonly used as a bridge before surgery in patients who are treated with oral anticoagulants to prevent thromboembolic complications. In addition, heparin is also indicated as an alternative to warfarin during the first trimester of pregnancy to avoid the risk of fetal embryopathy. Risk of thromboembolism, however, may be increased by the use of heparin compared with continuous use of warfarin.

Thromboembolic events may be caused not only as a result of insufficient anticoagulation on heparin, but also by heparin-induced thrombocytopenia thrombosis. Although heparin-induced thrombocytopenia thrombosis is a possible cause of catastrophic venous or arterial thromboembolism during i.v. heparin, its incidence may be underestimated. A 33-year-old woman with mechanical prosthetic valve (SIM 27 mm) in the mitral position was admitted to hospital due to pregnancy. She had been well-controlled on warfarin. Transthoracic echocardiography on admission showed normal prosthetic valve motion (Figure 1). After admission, i.v. heparin (20,000 IU/day) was started and warfarin was discontinued. Activated partial thromboplastin time was maintained at around 50 s. Seven days after admission, the patient suddenly developed dyspnea, and chest X-ray showed pulmonary congestion. On physical examination, diastolic rumble was audible, suggesting the presence of prosthetic valve stenosis. Transesophageal echocardiography indicated severely stenotic mitral prosthetic valve with thrombus formation (Figure 2A). After thrombolytic therapy using tissue plasminogen activator followed by increased dose of heparin, the size of the thrombus had increased (Figure 2B). Heparin-induced thrombocytopenia thrombosis was suspected and heparin was replaced with argatroban (0.7 μg·kg⁻¹·min⁻¹). Mitral valve replacement was then performed (Figure 2C) and the pregnancy terminated. The patient was found to be positive for HIT (heparin-induced thrombocytopenia) antibodies and was diagnosed as...
HIT type II.

Patients with cardiopulmonary disease are at higher risk during pregnancy. In particular, pregnancy is usually not recommended in patients with mechanical prosthetic valve treated with warfarin because of high risk. Despite strong suggestion by her primary care physician to terminate the pregnancy, the patient did not agree. Although current Japanese guidelines for indication and management of pregnancy and delivery in women with heart disease recommend the use of heparin during the first trimester of pregnancy, risk of thromboembolism may become higher. Chan et al reported that risk of valve thrombosis in pregnant women with mechanical heart valves was lower in women treated with warfarin throughout pregnancy than in those in whom warfarin was substituted with heparin in the first trimester or than in those in whom heparin was used throughout pregnancy (3.9% vs. 9.2% vs. 33.3%). In contrast, congenital fetal anomaly was reported in 6.4% of women treated with warfarin throughout pregnancy. Therefore, anticoagulation regimen for pregnant women with mechanical valves should be determined considering the risk and benefit of each regimen. Heparin-induced thrombocytopenia thrombosis should always be considered when paradoxical thromboembolic events occur during anticoagulation with heparin.

**References**