Histoical Change of Coronary Artery Bypass Graft in a Maintenance Hemodialysis Patient

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Dear Sir,

Patients with end-stage renal disease undergoing maintenance hemodialysis have an increased prevalence of conventional coronary risk factors [1]. Many reports have shown that percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass grafting (CABG) are the effective treatments in this group of patients [2-4]. Neitzel [5] studied 50 segments of aortocoronary bypass from 40 nondialyzed patients who underwent a second revascularization procedure. But morphological analyses of the coronary artery and coronary grafts in dialysis patients have not been reported previously.

Recently, we had the autopsy of a maintenance dialysis patient after CABG. We made histoical analyses of the coronary artery and saphenous vein graft.

A 55-year-old man on maintenance dialysis was admitted to our hospital under the diagnosis of hepatic failure after hemorrhagic shock with trauma. He died of sepsis on the 20th day after admission. He was introduced to maintenance dialysis when 43 years old. The cause of renal failure remained unclear, but nephrosclerosis was most suspected. When he was 51 years old, acute anteroseptal myocardial infarction followed unstable angina. One year later, his first coronary angiogram revealed a 99% stenosis at No. 13 of the left coronary artery. PTCA was performed successfully, but 5 months later, his second coronary angiogram revealed a total occlusion at No. 13 and a 99% stenosis at No. 6 (just proximal site). PTCA was considered to be a

Fig. 1. Left circumflex coronary artery (lower) with saphenous vein coronary graft (upper). Fibrous thickening of the intima in the coronary artery is notable. No aneurysmal change is seen in the vein graft.

contraindication. Saphenous vein grafts were employed to bypass the stenosis of No. 8 and 14. After CABG, he was free of anginal episodes under the administration of nitrates. Twenty months after the operation, his third coronary angiography was performed. Both coronary bypass grafts were patent. Six months after the third coronary angiogram, he died.

At autopsy, marked atherosclerosis and hyaline arteriosclerosis were noted. Atherosclerosis was also remarkable in coronary arteries. Both coronary bypass grafts were patent.

Figure 1 shows the left circumflex coronary artery (lower) with saphenous vein graft (upper). Marked fibrous thickening of the intima and calcification of the media are notable in the coronary artery, which is compatible with Neitzel's [5] report on nondialyzed patients. Thickening of the intima in the saphenous vein graft is also remarkable, but no calcification is seen. Aneurysmal dilation in the vein graft, which is reported in 14% of patients by Neitzel [5], cannot be found in our case.

Figure 2 shows severe calcification of the media in the left circumflex coronary artery (arrow). Total occlusion with thrombus is noted and a fibrous atheromatous plaque narrows the coronary artery.

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1/8*

Fig. 2. Left circumflex coronary artery. Total occlusion and severe Fig. 3. Intima of the left circumflex coronary artery. Marked calcification of the media is present (arrow). fibrous thickening is notable. Calcification is not remarkable. Elastica van Gieson. $\times 400$.

Figure 3 shows marked thickening of the intima in the saphenous vein graft (Elastica van Gieson's stain). Concentric proliferation of smooth muscle cells is notable. Collagen and elastin are also rich in the intima. No calcification can be seen in the intima and media. Marked thickening of the intima is compatible with Neitzel's [5] report, but no aneurysmal change is seen in our case.

Maintenance dialysis has a possibility to promote atherosclerosis. Severe calcification of the media of the coronary artery (fig. 2) was found in our case, and it might be the result of abnormal calcium and phosphate metabolism. Calcification of the coronary artery is frequently seen in long-term maintenance dialysis patients. But, as regards histological change in the coronary artery graft, we cannot find any difference between our patient and nondialyzed patients reported by Neitzel [5].

Ischemic heart disease is increasing among dialysis patients and the choice of therapy should be further investigated. PTCA and CABG are both effective among maintenance dialysis patients, and morphological analysis after these therapies should be investigated in this group of patients.

References

Rostand SG, Kirk KA: Relationship of coronary risk factors to hemodialysis-associated ischemic heart disease. *Kidney Int* 1982;22: 304-308.

Rostand SG, Kirk KA: Results of coronary artery bypass grafting in end-stage renal disease. *Am J Kidney Dis* 1988;4:266-270. Kahn JK, Rutherford BD: Short- and long-term outcome of percutaneous transluminal coronary angioplasty in chronic dialysis patients. *Am Heart J* 1990;119:484-489. Deutsch E, Bernstein RC: Coronary artery bypass surgery in patients on chronic hemodialysis. *Ann Intern Med* 1989;110:369-372. Neitzel GF, Barboriak JJ: Atherosclerosis in aortocoronary bypass grafts. *Arteriosclerosis* 1986;6:594-600.

III