Transarterial Fibrinolysis Using Tissue Plasminogen Activator in a Patient with Acute Renal Failure Due to Acute Thrombosis of Bilateral Renal Arteries

3 Years’ Follow-Up

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[1.5-1.0] [1.0-] [0.5-] LDH(IU/L) Γ10000
Dear Sir,
We performed successful fibrinolytic therapy using transarterial infusion of tissue plasminogen activator (t-PA) [1] in a housewife with acute renal failure due to acute thrombosis of bilateral renal arteries, and her renal function was stable for more than 3 years after the treatment. The value of transarterial infusion of t-PA is discussed.

H. D. Heparin (U/day)
Warfarin (mg/day) Furosemide (mg/day)
Cre (–) LDH (–)
Cremg/dl 10 Γ
4***1 t I
10000 5000 3000–2000
[2–1.5 ] 140–800 520–80

5000
Apr.
May
9 Dec

Fig. 1. Clinical course. HD = Hemodialysis; (1) = admission; (2) = cardiac catheteriza-tion; (3) = onset of right flank colicky pain; (4) = onset of left flank colicky pain.
Case Report
A 46-year-old housewife with regurgitation of the mitral valve who had been treated with
digitalis and warfarin was admitted to the 1st Department of Internal Medicine at Niigata
University Hospital for the treatment of progressive cardiac failure on February 2, 1988.
Urinalysis, blood chemistry and blood pressure were normal, and cardiac catheterization was
performed on February 5, 1988. On February 7, she developed right flank colicky pain without
evidence of gastrointestinal or gynecological lesion. Urinalysis showed hematoproteinuria, and
abdominal x-ray computed tomography revealed right renal infarction. On March 1, she
developed both left flank colicky pain and macroscopic hematuria without evidence of
hydronephrosis on ultrasonography, and 99mTc-dimercaptosuccinic acid (DMSA) renal
scintigraphy showed little accumulation. Anuria occurred just after the attack of left flank
colicky pain, and serum Cr increased to 175 µmol/l. Subsequent selective renal arteriography
demonstrated complete occlusion of the dorsal branch, severe stenosis of the ventral branch of
the right

Feb.
Mar.
1
2 25 28

renal artery and complete occlusion of the left renal artery. Then, 4,000,000 IU of recombinant
t-PA and 1,000,000 IU of recombinant t-PA were infused into the left renal artery and the ventral
branch of the right renal artery, respectively. This therapy promptly achieved revascularization to
a large extent, but temporary hemodialysis was inevitable. The time lag between onset of left
colicky pain and fibrinolysis therapy was approximately 8 h. On March 13, 1988, she got rid of
hemodialysis, her serum Cr level became
160 µmol/l, and no complication induced by t-PA occurred. Systemic anticoagulation therapy
was begun with 0.5-1.0 µg/day of warfarin, so that the value of the thrombo-test was between 10
and 25%. On September 29, 1988, she was successfully operated on with mitral valve
replacement. Three years after the operation, her serum Cr was maintained at 148 µmol/l (fig. 1).
Acute thrombosis of the renal artery is often detected too late for any therapeutic approach. The
time of warm ischemia which

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is tolerated without irreversible renal damage is almost 60 min [2]. Treatment modalities of acute
thrombosis of the renal artery are surgical removal of the embolus and fibrinolytic therapy [3].
Recently, recombinant t-PA has been developed and has been used for acute thrombosis of the
coronary artery by intravenous administration, t-PA is a synthetic fibrinolytic protein which
activates plasminogen or reverse plasminogen to plasmin specifically in the presence of fibrin.
With its ‘clot specificity’, t-PA is capable of lysing clots without having a significant effect on
circulating plasminogen, t-PA is usually administered intravenously for the thrombolytic therapy
of acute myocardial infarction within 6 h after onset [4]. However, the appropriate use of t-PA
for the fibrinolytic therapy of acute thrombosis of the renal artery has not been determined, t-PA
has been used for acute thrombosis of the renal artery in only 2 reports [5,6] in which t-PA was intra-arterially administered. Our case has been followed up and maintained with a stable renal function for a far longer period than these cases. The most important shortpoint of intravenous fibrinolytic therapy for acute myocardial infarction is a high incidence of early reoclusion associated with the occurrence of subsequent coronary events in a large number of patients [7,8]. According to this phenomenon and the prolonged ischemic time of our case, intra-arterial infusion might be better than intravenous infusion.

We may conclude that regional fibrinolytic therapy with intra-arterial infusion of t-PA is a safe and good therapy for acute thrombosis of the renal artery.

References
