Abstract: Several studies have reported that the use of a distal protection device decreases the incidence of slow-flow and/or no-reflow in patients with myocardial infarctions. In the present study, we investigated the influence of a RESCUE/Thrombuster system and a PercuSurge GuardWire catheter on coronary microcirculation disorders in patients with acute myocardial infarction using the natriuretic polypeptide (ANP), the brain natriuretic peptide (BNP), and \(^{99m}\)Tc-tetrofosmin myocardial scintigraphy (TF). The group consisted of 77 patients with initial inferior myocardial infarction who had undergone emergency coronary angioplasty. The patients were randomly divided into: Group D (n=28), in which a direct stent alone was inserted, Group R/T (n=25), in which a stent was inserted after RESCUE system or a Thrombuster system was performed, and Group P (n=24), in which a stent was inserted after thrombus suction using a PercuSurge GuardWire catheter. Patients with coronary slow-flow/no-reflow were 3, 2 and 0 cases in Group D, Group R/T and Group P, respectively. In the present study, patients with good-reflow were enrolled in order to investigate the coronary microcirculation disorder in patients with visually similar coronary blood flow obtained in coronary angiography after percutaneous coronary reperfusion therapy. TF myocardial scintigraphy was performed 10±3 days after admission. Bull’s eye images were divided into 8 sections, and each section was evaluated in 4 grades. The grade of each segment was regarded as the defect score. The results were compared with the database prepared based on bull’s eye maps from 50 healthy adults in our hospital, and count areas of \( \pm 2 \) SD (standard deviation) or less were calculated as the extent score (%), reflecting the area in which myocardial blood flow was decreased. The extent and severity scores in Groups P and R/T were significantly lower than those in Group D. Coronary angiography at the chronic stage (6 months after surgery) showed the patency of the responsible vascular lesion in all patients. However, the ANP, BNP, cardiac index, and pulmonary capillary wedge pressure (PCWP) were significantly improved in Groups R/T and P, compared to Group D (p<0.01). These results suggest that the use of a RESCUE/Thrombuster system and a PercuSurge GuardWire catheter system in patients with acute inferior wall infarction improves coronary microcirculation disorders and acute-to-chronic phase cardiac function. J. Med. Invest. 53: 167-173, February, 2006

Keywords: acute myocardial infarction; coronary microcirculation; thrombus suction therapy, TF myocardial scintigraphy
1) Patients

2) Coronary angiography and percutaneous coronary reperfusion therapy
3) Measurement of ANP and BNP

4) Evaluation of hemodynamics using left ventriculography and a Swan-Ganz catheter

5) Myocardial scintigraphy with $^{99}$mTc-tetrofosmin

6) Statistical analysis

1) Patient characteristics

<table>
<thead>
<tr>
<th>Patient characteristic</th>
<th>$n$</th>
<th>$%$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Statistical analysis revealed significant differences in the following characteristics:

- Age: $p < 0.05$
- Gender: $p > 0.05$
- Hypertension: $p < 0.01$
- Diabetes: $p < 0.01$
- Smoking: $p < 0.05$
- Alcohol consumption: $p < 0.01$

Further analysis indicated that patients with hypertension had significantly higher levels of ANP and BNP compared to those without hypertension ($p < 0.01$).
2) Comparison of ANP and BNP concentrations on admission and six months after reperfusion therapy

3) Myocardial scintigraphy with $^{99m}$Tc-tetrofosmin in Groups D, P, and RT.
4) Comparison of scintigraphic scores among Groups D, P, and R/T.

5) Pressure study and ejection fraction in the chronic stage
Y. Ozaki, et al.  Coronary myocardial blood flow after PTCA

Coronary myocardial blood flow after PTCA...