FFR Guided Percutaneous Coronary Intervention to Coronary Stenosis with Coronary Artery-Pulmonary Trunk Fistula

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Department of cardiovascular medicine

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Case : 72y.o Male

- Chief Complaint
  Dyspnea

- Past History
  Hypertension, Diabetes, Dyslipidemia

- Present illness

  In 2011, he complained dyspnea and came to our hospital. Symptom had worsened over 1 month. Chest roentgen revealed pulmonary congestion. Echocardiogram showed anterior wall motion abnormality.
Physical examination

Height 165cm, Body weight 61 kg, BMI 22.4
Body temperature 35.7℃, Blood pressure 136 / 62 mmHg
Pulse 70 bpm and regular, SpO2 99 % (room air)
Neck: No Jugular venous distension.
     normal carotid pulse without bruit.
CHEST: Lungs were clear to auscultation.
HEART: no murmur
Abdomen: Abdominal examination was unremarkable.
Extremities: Pretibial edema and no cyanosis
     Peripheral pulses were all good and equal
## Laboratory Examination

### Count blood cell

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>WBC</td>
<td>8400</td>
</tr>
<tr>
<td>RBC</td>
<td>426 $10^4$</td>
</tr>
<tr>
<td>Hb</td>
<td>13.5</td>
</tr>
<tr>
<td>Ht</td>
<td>39.8</td>
</tr>
<tr>
<td>Plt</td>
<td>26.4 $10^4$</td>
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</table>

### Biochemistry

<table>
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<tr>
<th>Parameter</th>
<th>Value</th>
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<tbody>
<tr>
<td>UA</td>
<td>5.5</td>
</tr>
<tr>
<td>BUN</td>
<td>14</td>
</tr>
<tr>
<td>Cre</td>
<td>1.63</td>
</tr>
<tr>
<td>TC</td>
<td>264</td>
</tr>
<tr>
<td>TG</td>
<td>74</td>
</tr>
<tr>
<td>HDL-C</td>
<td>94</td>
</tr>
<tr>
<td>LDL-C</td>
<td>144</td>
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<tr>
<td>HbA1c</td>
<td>6.3</td>
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<tr>
<td>BNP</td>
<td>221.1</td>
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<tr>
<td>TP</td>
<td>7.2</td>
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<tr>
<td>T-Bil</td>
<td>0.5</td>
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<tr>
<td>GOT</td>
<td>28</td>
</tr>
<tr>
<td>GPT</td>
<td>16</td>
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<tr>
<td>LDH</td>
<td>290</td>
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<tr>
<td>ALP</td>
<td>315</td>
</tr>
<tr>
<td>γ-GTP</td>
<td>11</td>
</tr>
<tr>
<td>CPK</td>
<td>55</td>
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<tr>
<td>CPK-MB</td>
<td>16</td>
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</table>

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Na</td>
<td>140</td>
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<tr>
<td>K</td>
<td>4.3</td>
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<tr>
<td>Cl</td>
<td>105</td>
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<tr>
<td>Ca</td>
<td>9.1</td>
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<tr>
<td>CRP</td>
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</tbody>
</table>

**Units:**
- UA: mg/dl
- BUN, Cre: mg/dl
- TC, TG, HDL-C, LDL-C, BNP: mg/dl
- HbA1c: %
- TP, T-Bil: g/dl
- GOT, GPT: IU/l
- LDH: IU/l
- ALP: IU/l
- γ-GTP, CPK, CPK-MB: IU/l
- Na, K, Cl, Ca: mEq/l
- CRP: mg/dl
Right Heart Catheterization

- RA: 6 mmHg
- RV: 46/7 mmHg
- PA: 40/15 mmHg
- PCWP: 21 mmHg

Pulmonary to systemic flow ratio: 1.11
Problem

The reasons of heart failure
a. LAD stenosis
b. shunt through coronary-PA fistula.

The therapy for myocardial ischemia
a. PCI to LAD stenosis
b. coil embolism to fistula
c. both
LAD
Pressure Wire Certus

FFR = 0.36
Fistula closed
Voyager NC 2.5mm

LAD
Pressure Wire Certus

FFR=0.58
PCI

TAXUS Express
3.0 × 32mm

bp22 3.0mm
Post dilatation
Final CAG
LAD Pressure Wire Certus

FFR=0.87
Fistula closed

FFR = 0.94
Electrocardiogram, Stress Thallium SPECT

Before

After

Stress

Rest

Before

After
## Summary

<table>
<thead>
<tr>
<th></th>
<th>Fistula closed</th>
<th>Fistula open</th>
<th>Difference</th>
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</thead>
<tbody>
<tr>
<td>Before PCI</td>
<td>0.58</td>
<td>0.36</td>
<td>0.22</td>
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<tr>
<td>After PCI</td>
<td>0.94</td>
<td>0.87</td>
<td>0.06</td>
</tr>
</tbody>
</table>

### Before PCI

- **FFR=0.48**
  - Fistula closed
  - Fistula open
  - Difference: 0.22

### After PCI

- **FFR=0.94**
  - Fistula closed
  - Fistula open
  - Difference: 0.06
Conclusion

When coronary PA fistula is accompanied by coronary stenosis, FFR may be effective for the PCI.