ISOLATED CORONARY OSTIAL STENOSIS COMPARED WITH LEFT MAIN TRUNK DISEASE.

SHIRO SASAGURI, M.D., YASUYUKI HONDA, M.D., AND TATSUJI KANOU, M.D.*

Isolated coronary ostial stenosis (OS) is a rare disease of unknown etiology. Five cases of OS were observed amongst 700 elective coronary bypass patients, and were compared with 111 cases of atherosclerotic left main trunk disease (LMTD) to clarify clinical characteristics. Mean age for LMTD patients was 61.2 years, while it was 43.0 years for OS patients. 4 patients out of the 5 cases (80%) in the OS group were female, but there were only 10 females (9%) in the LMTD group. 60% of the OS group presented unstable angina without any episodes of myocardial infarction. 69.4% of the LMTD group presented stable angina, and 42% had a previous myocardial infarction. Left ventricular function was well preserved in the OS group compared to the LMTD group.

Aorto-coronary bypass grafting was the only surgical method of our choice in both groups. The average number of grafts were 2.2 for the OS group, and 2.4 for LMTD group. Operative mortality was 0% for the OS group and 0.9% for the LMTD group.

Clinical and angiographic profiles of ostial stenosis suggest that this group may represent a distinct entity, different from the more common atherosclerotic left main trunk stenosis. Coronary bypass grafting can provide good operative prognosis in ostial stenosis as well as in left main trunk stenosis.

Isolated coronary ostial stenosis (OS) is a rare disease which is neither associated with syphilitic aortitis, aortitis syndrome nor with other systemic disease. To clarify the clinical characteristics of coronary ostial stenosis, we compared the clinical profiles of this group with those of atherosclerotic left main trunk stenosis (LMTD) in coronary bypass patients.

MATERIALS AND METHODS

Between January 1984 and June 1989, 700 patients underwent elective coronary artery bypass grafting for ischemic heart disease at Juntendo University. Among them, 111 cases (15.9%) had left main trunk stenosis, and 5 cases (0.7%) had left coronary ostial stenosis. We compared the clinical profiles of these 2 groups to clarify the characteristics of each group.

Prior to operation, all patients underwent coronary angiography and left ventriculography. Significant stenosis of coronary ostial or left main trunk disease was defined as a 50% or greater diameter narrowing. Patients were classified as having 1-, 2, or 3 vessel disease, based on the presence of 75% or greater diameter narrowing in the distal three major coronary arteries. Ejection fraction was measured from the right oblique projection of the left ventriculogram.

Angina was graded by the Canadian Cardiovascular Society Classification (CCVS). Prior myocardial infarction was diagnosed by the clinical history or by the presence of Q waves on the electrocardiogram. Periopera-
TABLE I  PATIENT VARIABLES

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<th>OS</th>
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<tr>
<td>(n=5)</td>
<td>(n=111)</td>
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<tr>
<td>Mean age</td>
<td>43.0 ± 5.4</td>
<td>61.2 ± 7.8</td>
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<tr>
<td>Female</td>
<td>4 (80%)</td>
<td>10 (9%)</td>
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<tr>
<td>Presentation</td>
<td>2 (40%)</td>
<td>77 (69.4%)</td>
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<tr>
<td>Stable angina</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstable angina</td>
<td>3 (60%)</td>
<td>32 (28.8%)</td>
</tr>
<tr>
<td>MI</td>
<td>0 (0%)</td>
<td>2 (1.8%)</td>
</tr>
<tr>
<td>CCSV</td>
<td>3.2 ± 1.0</td>
<td>2.5 ± 0.9</td>
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<tr>
<td>Duration of symptoms (mon.)</td>
<td>59.0 ± 70.9</td>
<td>52.1 ± 61.1</td>
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<tr>
<td>Previous infarct</td>
<td>0 (0%)</td>
<td>47 (42.3%)</td>
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All data are expressed as Mean ± STD.

The LMTD group, but 4 females (80%) in the OS group. There was a preponderance of middle-aged females in OS group in contrast to the LMTD group.

Unstable angina was present in 60.0% of patients with OS and in 28.8% with LMTD. The duration of symptoms varied widely in both groups, with no significant differences. Previous myocardial infarction was noted in 42.3% of patients with LMTD. None of the patients with OS had experienced myocardial infarction, or had signs suggesting aortic or venereal disease. Routine hematologic investigation showed normal erythrocyte sedimentation rate and C-reactive protein values.

The incidence of coronary risk factors for both groups is listed in Table II. Compared to the LMTD group, a lower incidence of coronary risk factors was noted in the OS group.

The morphological patterns seen on angiograms of stenosis and the percentage of female predominance are demonstrated in Fig. 2. The ostial lesions were characterized as concentric, short-segment stenosis, in contrast to most of the left main trunk lesions which were eccentric and long segment. No female predominance was noted in the LMTD group. The left ventricular function expressed as ejection fraction was well preserved in the OS group (73.1 ± 5.1%), compared to the LMTD group (54.9 ± 27.0%) (Table III). The mean number of diseased vessels other than that of the main lesion was 0 for the OS group, and 2.0 ± 1.1 for the LMTD group. Critical stenosis of more than 90% was found in 60% of patients in the OS group and 36% in the LMTD group.

The number of grafts per patient in the OS
Morphological patterns of stenosis and Sex
(reviewed 107 cases)
F : females

Fig.2.

TABLE III  ANGIOGRAPHIC FINDINGS

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<tr>
<th></th>
<th>OS</th>
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<tr>
<td>Ejection Fraction</td>
<td>$73.1 \pm 5.1$</td>
<td>$54.9 \pm 27.0$</td>
</tr>
<tr>
<td>Diseased vessels per patient</td>
<td>0</td>
<td>$2.0 \pm 1.1$</td>
</tr>
<tr>
<td>Stenosis &gt;90%</td>
<td>$3 (60%)$</td>
<td>$40 (36%)$</td>
</tr>
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group and LMTD group was similar in spite of the variance in the numbers of the diseased vessels. Perioperative myocardial infarction occurred in 1 patient (20%) of the OS group, and 4 patients (3.6%) of the LMTD group. Operative mortality was low in both groups, 0% for the OS group and 0.9% for the LMTD group.

None of the specimens from the aortic wall of the OS group were found to have the pathologic changes attributable to either aortitis or syphilitic disease.

DISCUSSION

This study revealed several unusual clinical features of isolated ostial stenosis which we experienced in a limited number of patients. The patients with isolated coronary ostial stenosis presented severe symptoms of angina, but with low incidence of coronary risk factors. The greater prevalence of female, especially premenopausal women, was another characteristic feature of this group. Concentric and short segment stenosis without distal coronary lesions was also a typical angiographic finding in isolated coronary ostial stenosis.

In contrast, the patients with atherosclerotic left main trunk disease presented the forms of stable angina with a high incidence of positive coronary risk factors. Most patients were older males. In most cases in this group, the left main stenosis was associated with distal coronary lesions which frequently impaired left ventricular function.

Isolated coronary ostial stenosis is a rare disease! The incidence being merely 0.63% of the coronary bypass patients in this series. Its etiology is entirely unknown. In a review of the literature, several factors are listed. Coronary ostial membrane, as well as hypoplasia or atresia of the coronary ostia, has been described as a congenital cause of the

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Fig. 3. (A): Left coronary angiogram before operation. Isolated coronary ostial stenosis is visualized (arrowed).
(B): Left internal thoracic arteriogram after operation. Left internal thoracic artery provided adequate coronary perfusion to left coronary system.

lesion. Inflammatory involvement of aortic wall such as syphilitic aortitis or aortitis syndrome has been also documented as a cause of isolated coronary ostial stenosis. Arteriosclerosis of the sinus of Valsalva or early atheroma on the coronary ostia has been assumed to be a most likely cause of the lesion. However, the fact that ostial stenosis occurs predominantly in premenopausal women, may indicate that humoral factors may accelerate the intimal thickening. A congenital anomaly of coronary ostium, complicated with progressive intimal thickening, stimulated by inflammatory process or humoral factors may be one explanation for this disease.

Although previous reports have noted that ostial stenosis occurs more frequently in the right coronary artery only the left coronary ostium was involved in our surgical patients. Barner et al. reported 38 patients with isolated ostial stenosis from their 8509 bypass patients, 10 of which were on the right, and 28 on the left. In the coronary bypass patients, there may be more cases with left ostial stenosis which may cause more severe symptoms than the right ostial stenosis. However, the true prevalence of ostial stenosis of the right and left coronary artery is not clear.

The operative results in both stenosis and left main disease group were satisfactory, although a few cases had perioperative myocardial infarction. Our surgical approach to coronary ostial stenosis is double bypass grafting to the left anterior descending artery and circumflex artery using the internal thoracic artery or saphenous vein graft. Although single bypass grafting to the left anterior descending artery can provide adequate coronary perfusion, it may result in severe myocardial infarction or angina in case of graft failure. Transaortic vein patch angioplasty or endarterectomy is an anther surgical option to the ostial stenosis. However, this surgical procedure seems to be technically demanding when compared with bypass grafting, and such a direct surgical approach to the ostial stenotic lesion may injure the intact intimal layer, and may induce the acceleration of intimal hyperplasia postoperatively. To prevent perioperative myocardial infarction, which we experienced in a few cases, it might be useful to infuse the cardioplegic solution through coronary sinus retrogradely or vein graft after distal anastomosis for myocardial protection. We believe that bypass grafting is a safer surgical approach with good results.

In summary, coronary ostial stenosis showed distinct clinical characteristics from that of atherosclerotic left main trunk disease, suggesting it to be a different clinical entity. Surgical intervention with bypass grafting can provide good prognosis in both groups.
REFERENCES

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