Surgery for Complications Due to Myocardial Infarction

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Complications of myocardial infarction, are: (1) left ventricular aneurysm, (2) mitral valve regurgitation, (3) free wall rupture, (4) pseudo-aneurysm, (5) ventricular septal perforation, etc. We have performed operations on 102 cases with these complications of myocardial infarction.

I. Left Ventricular Aneurysm (60 cases)
Criteria for indications for aneurysmectomy are:
(1) heart failure which does not improve by medical therapies,
(2) recurrent tachyarrhythmia (ventricular fibrillation, ventricular tachycardia),
(3) multiple episodes of embolus, and
(4) other symptoms requiring coronary artery bypass grafting (cABG).

(A) Recurrent tachyarrhythmia
Subjects studied consisted 13 cases whose symptoms produced VF and VT by resisting all the medical therapies even when it has reached its chronic stage after passing an acute stage.
Anti-arrhythmic agents such as Xylocaine®, Amisaline®, Ajmaline®, Aleviati®, Antiarrin®, Quinidine, B-blockade, Ca-antagonist, etc. were administered as drugs. Digitalis and diuretic were also given. Catecholamine and coronary dilators were given to half of the heart failure cases.
Ventricular fibrillation occurred in 11 of 13 cases in their acute stage of myocardial infarction. Ventricular tachycardia occurred in all cases either in their subacute or chronic stage, and ventricular fibrillation developed in 7 cases.
2 out of 13 cases had DC performed more than 50 times preoperatively. Burn was caused on the thoracic skin by DC and gastric bleeding by gastric stress ulcer.
Operations performed in 8 cases were simple aneurysmectomy or aneurysmectomy plus CABG. Auto-defibrillator was implanted in one out of 5 cases. On 4 cases, encircling endocardial ventriculotomy (EEV), endocardial resection (ER), endocardial resection (ER) and cryosurgery were performed concurrently with aneurysmectomy.
12 out of 13 patients were saved by these treatments and were discharged from the hospital.

(B) Application of left ventricular assist device (LVAD) to worst left ventricular function
Out of 60 aneurysmal cases, those with ejec-

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<th>Table 1</th>
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<tr>
<td>Admission Swan-Ganz (2 May)</td>
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<tr>
<td>HR 117, Ao 100/67, PA 56/35 (mean 44), wedge 32 mmHg, CO 3.5 (CI 2.18) l/min</td>
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<td>Hemodynamics (23 May)</td>
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<tr>
<td>HR 90 EDV 368 ml (EDVI 233 ml/m²)</td>
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<td>SV 46 ml</td>
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<td>EF 12.5%</td>
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<td>CO 4.1 l/min (CI 2.6 l/min/m²)</td>
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<td>Swan-Ganz : CO 3.5 l/min (CI s.s l/min/m²)</td>
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<td>Mitral regurgitant flow 0.6 l/min, % perimetric circumference 63%, active muscle contractility 10%</td>
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<td>Ao 92/67 mmHg, LVSP 92 mmHg, LVEDP LVEDP 30 mmHg,</td>
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<td>PA 50/25 mmHg, wedge 23 mmHg</td>
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Key words:
Aneurysmectomy
LVAD
Papillary muscle rupture
Ventricular septal perforation

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tion fraction of less than 35% were 51, and the lowest value was 6.2%. This particular case attained improvement from NYHA IV to NYHA II by resection of the affected region plus that of mural thrombus in 522g.

Aneurysmectomy was performed on a patient aged 37 with left ventricular aneurysm of NYHA IV whose ejection fraction was 12.5%. However, weaning from extracorporeal circulation was not possible even when catecholamine was given and the circulation was assisted with IABP. Therefore, LVAD was set, and the patient was saved with improvement of the cardiac performance as a result of using LVAD for 4 days and IABP for 9 days. Table I shows the haemodynamic study made during the use of LVAD.

56 patients of 60 who underwent aneurysmectomy were saved.

II. Ischemic Mitral regurgitation

The cause of post-infarction mitral regurgitation are listed as papillary muscle rupture (PMR) and papillary muscle dysfunction syndrome (PMDS).

In ischemic mitral regurgitation, another symptom is added coronary artery stenosis complicated by mitral regurgitation due to (cord rupture CCR). We have performed operations on ischemic mitral regurgitation in 10 cases.

(A) Papillary muscle rupture (PMR) (1 case)

This was a female aged 72 admitted to CCU of Teikyo University on January 26, 1985, with acute myocardial infarction. The patient was in shock condition of Killip IV and Forrester IV. Systolic murmur was auscultated in the apex area. The findings obtained by Swan-Ganz catheter showed shock stage. For this catecholamines was administered, and IABP and respirator were used. All the possible treatments failed to alleviate the symptom, and a severe congestion was observed in the chest X-ray. As the symptom worsened beyond the limit of medical therapies, the patient was admitted to our hospital for operation via a mobile CCU while IABP was applied to the patient.

PMR was suspected through echocardiogram as shown in Fig.1, for which emergency operation was performed on February 4, 1985. Complete rupture was observed in the mid portion of the postero-medial papillary muscle. Replacement of the mitral valve was made. Postoperative progress was favorable, and the patient was discharged.

(B) PMDS (6 cases)

Mitral valve plasty and CABG were performed on 3 cases of the mitral regurgitation according to Sellers’ criteria II.

Mitral valve replacement and CABG were performed in 3 cases of the mitral regurgitation according to Sellers’ criteria III-IV. Lives of all the 6 cases were saved.

Fig. 2. Free wall rupture.

Fig. 3. Ventricular septal perforation.

(C) CR (3 cases)
Mitral valve replacement and CABG were made in 3 cases of chord rupture, and lives of all of the patients were saved.

III. Left Ventricular Free Wall rupture (5 cases)
1 out of 5 patients was saved. (Fig. 2).

IV. Left Ventricular Pseudo-aneurysm (2 cases)
Both patients were saved.

V. Septal Perforation Due To Acute Myocardial Infarction (26 cases)
21 out of 26 patients were saved by operation which includes those performed on aged (79, 80) patients in acute stages.

Figure 3 shows the annual comparison between medical therapies and surgical therapies. Life saving rate had begun to rise from 1978 onward.