

Coronary Artery Surgery Results 2005 in Japan

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This report is focused on the status and outcome of coronary artery surgery performed in Japan, from January 1 to December 31, 2005. A total of 12,207 cases underwent coronary artery bypass grafting (CABG), as an isolated or concomitant procedure. Isolated CABG was performed in 9,827 patients. The operative mortality for patients who underwent isolated CABG was 1.91% in 2005. The mortality for initial elective CABG was 0.89%. These are the most improved results obtained since annual surveys started over 30 years ago. Since 1996 the number of off-pump CABG (OPCAB) cases increased year after year. This less-invasive procedure was performed on 4,936 patients in 2005, which is 61.0% the of total number of CABG cases. Mortality improved after complete OPCAB to 0.60%, which is the lowest rate since this procedure has been introduced. More than half (50.6%) of 4 and/or more grafting patients underwent OPCAB, which is higher rate than that (49.7%) in 2004. The percentage of elderly patients undergoing coronary artery bypass surgery is rising every year. In 2005, 46.5% of patients were aged 70 years or older and 7.8% were aged 80 years or older. The utilization rate of arterial grafts was 70%. (Ann Thorac Cardiovasc Surg 2007; 13: 220–223)

Key words: coronary artery bypass grafting, off-pump coronary artery bypass grafting, annual survey, Japan, 2005

Introduction

The Japanese Association for Coronary Artery Surgery (JACAS) has been conducting annual surveys of coronary artery surgery since 1970, since the time of its predecessor organization.^{1–10)} The most recent survey consists of coronary artery surgery performed in the year from January 1 to December 31, 2005. Completed questionnaires were returned by 319 institutions with cardiac surgery departments. This report summarises the advances in coronary artery surgery in Japan based on the status of coronary artery surgery over the past year and a review of the results of previous surveys.

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Operative mortality is defined as any death within 30 days after the day of surgery. Operative mortality by patient characteristics was examined by χ^2 statistics.

Total Number of Coronary Artery Surgery and Off-Pump Coronary Artery Bypass Grafting (CABG)

A total of 12,207 patients underwent coronary artery bypass surgery in 2005. Of these, 9,827 underwent CABG only. The other 2,380 patients underwent additional procedures for myocardial infarction or other associated diseases. Of isolated CABG cases, initial elective surgery was performed in 8,089 patients. In initial elective isolated CABG cases, off-pump CABG (OPCAB) was made in 4,936 patients which is 61% of them (Table 1).

Changes in OPCAB Rate of Initial Elective Isolated CABG

Figure 1 shows changes of the OPCAB rate in last 10 years. Since 1996, the number of OPCAB cases increased

Table 1. Total number of coronary artery surgery and off-pump CABG rate

Total number	12,207		
Isolated CABG	9,827		
Concomitant CABG	2,380		
Isolated CABG			
Initial elective	8,089	Except for initial elective	1,738
Off-pump	4,936	Off-pump	820
On-pump	3,153	On-pump	918
(Off-pump rate)	61%		

CABG, coronary artery bypass grafting.

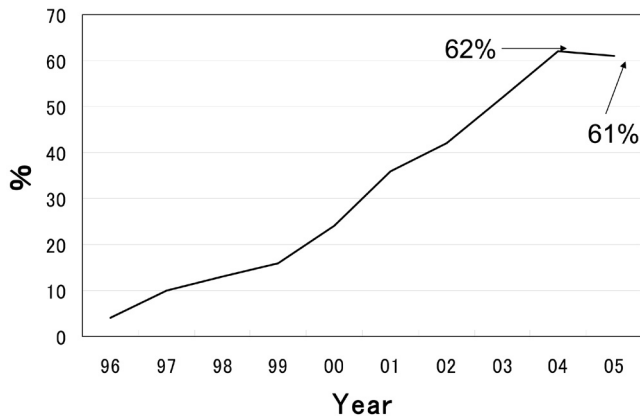


Fig. 1. Changes in OPCAB rate of initial elective isolated CABG.

year after year till 2004, 62%. Although this rate slightly decreased in 2005, 61% patients of initial elective isolated CABG underwent OPCAB, indicating a persistently high rate.

Surgical Procedures of Initial Elective Isolated CABG

Of initial elective isolated CABG, a total of 2,725 cases (33.7%) underwent on-pump CABG with cardiac arrest, 428 patients underwent on-pump with cardiac beating (5.4%), and OPCAB was used in 4,936 (61.0%). In those OPCAB cases, 4,815 patients (97.5%) underwent off-pump till the end of operation. The remaining 121 cases were converted from off-pump to on-pump CABG. The converting rate was 2.5%, which was lower than that in 2004, at 3.8% (Table 2).

Outcome According to Procedures

The mortality for the total number of isolated CABG was 1.91%, which was lower than that in 2004. For isolated initial elective cases this was 0.89%, demonstrating the

Table 2. Surgical procedures of initial elective single coronary artery bypass grafting

Total number of initial elective	8,089 (100%)
On-pump (cardiac arrest)	2,725 (33.7%)
On-pump (cardiac beating)	428 (5.4%)
Off-pump (total number)	4,936 (61.0%)
Off-pump (complete)	4,815 (59.5%)
On-pump (convert)	121 (1.5%)
Off-pump (complete rate)	97.5%
Off to on-pump (convert rate)	2.5%
(Previous year)	3.8%

Table 3. Outcome according to procedures

Mortality for CABG only	1.91%
(Previous year)	1.95%
Mortality for initial elective CABG only	0.89%
(Previous year)	1.04%
On-pump (cardiac arrest)	1.17%
On-pump (cardiac beating)	1.40%
Off-pump (total)	0.68%
Off-pump (complete)	0.60%
(Previous year)	0.88%
On-pump (convert)	4.13%
(Previous year)	3.38%

CABG, coronary artery bypass grafting.

best results since this the initiation of the survey. The mortality for complete OPCAB was 0.60%, which is lowest since this less-invasive procedure has been introduced. However, mortality for conversion from off- to on-pump was 4.13%, which still indicates a high mortality (Table 3).

Changes in Mortality of CABG

The changes in mortality since 1996 are shown in Fig. 2. The clinical results improved yearly. Operative mortality of CABG only cases decreased to 1.91% and that of initial elective patients decreased to 0.89% in 2005. These

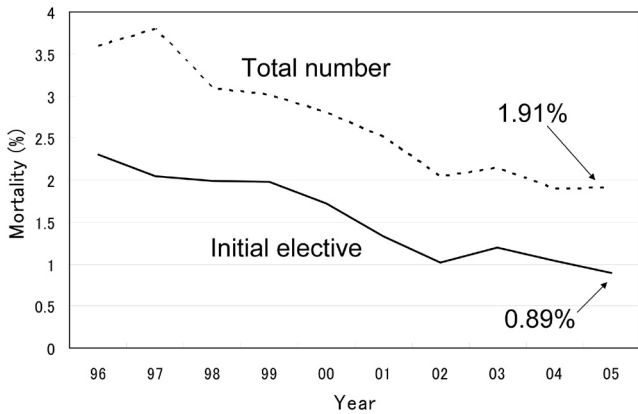


Fig. 2. Changes in mortality of CABG.

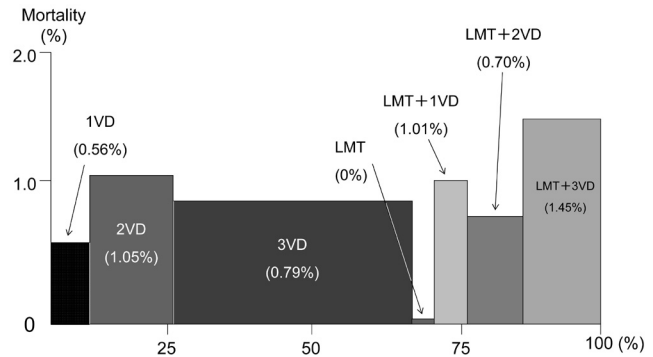


Fig. 3. Outcome according to number of diseased vessels: initial elective surgery.

VD, vessels disease; LMT, left main trunk.

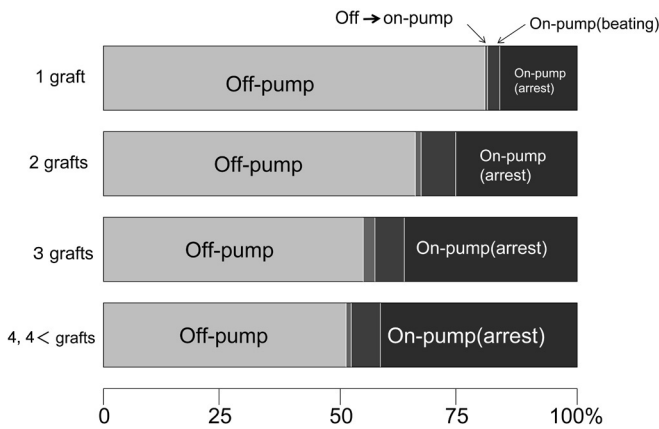


Fig. 4. Surgical procedures according to number of grafts.

are the best results obtained since annual commenced 30 years ago.

Outcome According to Number of Diseased Vessels: Initial Elective Surgery

Outcome according to the number of diseased vessels for initial elective cases is shown in Fig. 3. The horizontal axis shows number of diseased vessels, whether it was one, two or three vessels disease, concomitant with left main trunk (LMT) and the percentage of patients represented. The vertical axis shows the mortality for each type of disease.

Three vessels disease without LMT lesion was most common disease, indicating 44% of all types. Its mortality was 0.79%, indicating an excellent result; however, operative mortality was 1.45% for the cases with LMT with 3 vessel disease.

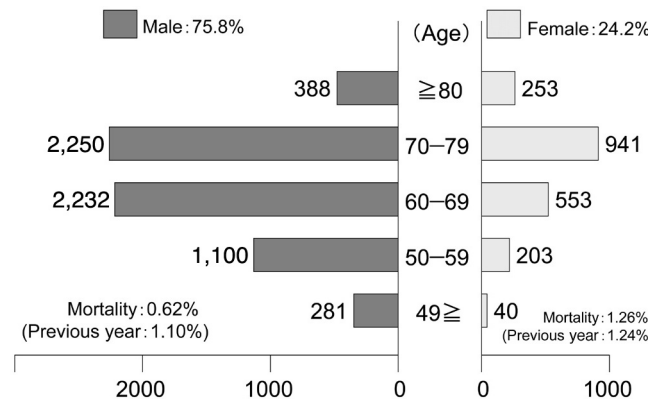


Fig. 5. Age distribution according to gender: initial elective surgery.

Surgical Procedures According to Number of Grafts

Figure 4 shows the surgical procedures according to number of grafts; 84% of single grafting cases underwent OPCAB. The increasing number of grafts created the higher rate of on-pump CABG. More than half (50.6%) of patients having 4 or more grafts underwent OPCAB, which is a higher rate than that (49.7%) in 2004.

Age Distribution According to Gender: Initial Elective Surgery

Figure 5 shows the age distribution according to gender of all cases; 75.8% of all cases were male. Gender distribution study in decades shows that most patients were in their 1970s in men and women. Mortality of men was 0.62%, in contrast 1.26% in women.

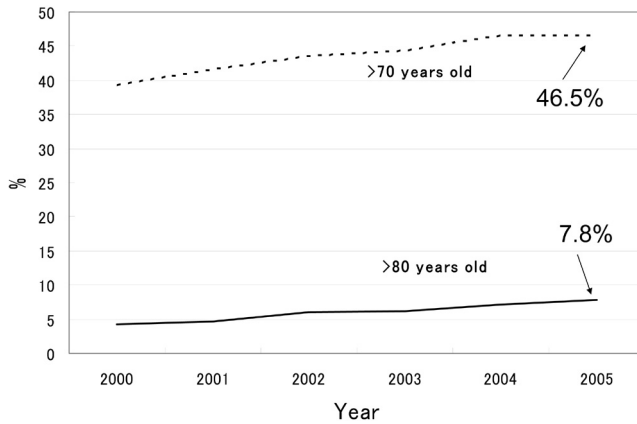


Fig. 6. Changes in rate of elderly: initial elective surgery.

Changes in Rate of Elderly: Initial Elective Surgery

The proportion of elderly patients increased yearly, as shown in Fig. 6: 46.5% of patients were older than 70 years old; patients over 80 years old have increased to 7.8%, in 2005.

Graft Selection: Isolated CABG Cases

The total number of grafts was 24,784 in isolated CABG procedures. The left internal thoracic artery was most commonly used (37.1%), followed by the right internal thoracic artery. The utilization rate of arterial grafts was 70% in isolated CABG (Fig. 7).

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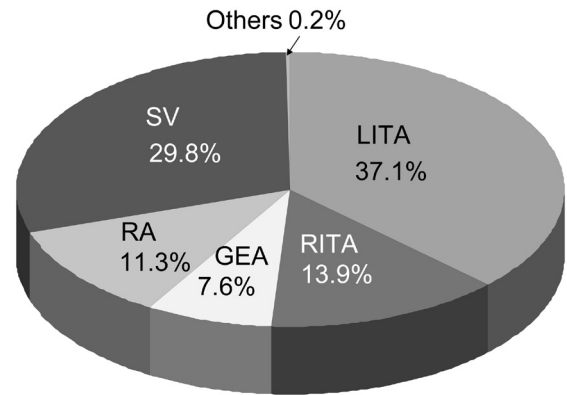


Fig. 7. Graft selection: isolated CABG cases.

SV, saphenous vein; RA, radial artery; GEA, gastro-epiploic artery; RITA, right internal thoracic artery; LITA, left internal thoracic artery.

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