Acute coronary syndromes due to the left main stem stenosis
Treatment and 12-month outcome in clinical practice

Analysis from the PL-ACS Registry
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Background

The left main stenosis as a culprit lesion is a serious cause of acute coronary syndromes (ACS) leading to a high mortality despite revascularization procedures.

Unprotected left main revascularization in patients with acute coronary syndromes

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Conclusions

Unprotected left main coronary disease in patients presenting with an ACS is a rare but serious situation, with high in-hospital mortality, especially in those presenting with STEMI and/or haemodynamic or arrhythmic instability. Percutaneous coronary intervention has become the most common strategy of revascularization in ACS patients with ULMCD and is generally preferred in patients with multiple comorbidities and/or in very unstable patients. In contrast, CABG surgery, when possible, is often delayed by a few days and is associated with good 6-month survival. Therefore the two modes of revascularization appear complementary in this high-risk group.
The purpose of this study was:
- To present the treatment strategies and 12-month outcomes in a population of acute coronary syndrome (ACS) patients with a special attention to urgent and deferred revascularization procedures.
In brief, the PL-ACS registry is an ongoing, nationwide, multicentre, prospective, observational study of consecutively hospitalized patients with the whole spectrum of acute coronary syndromes in Poland. It is a joint initiative of the Silesian Centre for Heart Diseases and the Ministry of Health of Poland. Logistic support is obtained from the National Health Fund, which is a nationwide public health insurance institution in Poland and from which an insurance policy is required for all Polish citizens. The pilot phase of the Registry commenced in October 2003 in the Silesia region. In the following months, further regions were opened and, since June 2005, all Polish regions collect data for the PL-ACS Registry.

A detailed protocol with inclusion and exclusion criteria, methods and logistics, and definitions of all fields in the registry dataset was prepared before the registry was started. However, it has since been revised in May 2004 to be compatible with the Cardiology Audit and Registration Data Standards (CARDS). Nevertheless, the PL-ACS Registry case report form (CRF) covers only part of the CARDS dataset.
HOSPITALS
Hospitals are invited to enter the registry either if they have one of the following wards: coronary care unit, cardiology, cardiac surgery, internal medicine or intensive care unit, or if they hospitalize at least 10 acute coronary syndrome patients per year.

PATIENTS
All admitted patients with suspected ACS are screened for eligibility to enter the registry, but they were not enrolled until acute coronary syndrome is confirmed. The patients are then classified as having unstable angina, non-ST-segment myocardial infarction, or ST-segment elevation myocardial infarction. If the patient is hospitalized during the same acute coronary syndrome in more than one hospital (transferred patient), all hospitals are required to complete the registry data. These hospitalizations are linked together during data management and are analyzed as one ACS.
**DATA COLLECTION**
Data are collected by skilled physicians who were in charge of each particular patient and either entered directly into an electronic CRF or temporarily printed onto a CRF before being transferred to an electronic CRF. Internal checks for missing or conflicting data and values markedly out of the expected range are implemented by the software. In the data management and analysis centre, further edit checks are applied if necessary.

**FOLLOW-UP DATA**
All-cause mortality data with exact dates of deaths are obtained from official mortality records from the National Health Fund.

![Graph showing cumulative number of patients by year and type of treatment](image)

- **Number of patients**: 284,162
- **Number of centers**: 512
  - Invasive: 88
  - Non-invasive: 424

Cumulative number of patients by year:
- 2003: 3,915
- 2004: 25,880
- 2005: 87,018
- 2006: 150,258
- 2007: 196,455
- 2008: 249,960
- 2009: 284,162
All patients with ACS due to left main stem stenosis as a culprit lesion who were registered in the prospective, population-based Polish Registry of Acute Coronary Syndromes (PL-ACS) were included in the analysis.

- Enrolment period: October 2003 to October 2008
- For them an urgent (coronary angioplasty or bypass surgery) or deferred (bypass surgery or angioplasty after discharge) revascularization was chosen by the responsible staff.
- In PL-ACS Registry 94,569 (46%) pts from 206,985 had coronary angiography performed.
- There were 2082 (2.2%) ACS caused by the left main stem stenosis (LM).

### Acute Coronary Syndrome (ACS)

- **N = 206,985**
  - Exclusions -> Non-invasive treatment **N=112,416**

### ACS with invasive treatment

- **N = 94,569 (46%)**
  - Exclusions -> ACS not caused by LM **N=92,487**

### ACS caused by LM stenosis

- **N = 2,082 (2.2%)**
Most of the patients had revascularization performed. In 107 (5.1%) of pts revascularization was not planned or possible with in-hospital mortality 12.3% and 12-month mortality 31.1%.
Results (1)

Baseline characteristics

- Urgent revascularization was performed in 41.5% pts with unstable angina (UA), in 55.9% pts with non-ST-segment elevation myocardial infarction (NSTEMI), and in 83.6% pts with ST-segment elevation myocardial infarction (STEMI).
- These patients were of higher risk as compared to patients with deferred revascularization.

<table>
<thead>
<tr>
<th></th>
<th>UA (N=753)</th>
<th>NSTEMI (N=698)</th>
<th>STEMI (N=524)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCI, %</td>
<td>74.1*</td>
<td>0*</td>
<td>83.0*</td>
</tr>
<tr>
<td>CABG, %</td>
<td>25.9*</td>
<td>100*</td>
<td>17.0*</td>
</tr>
<tr>
<td>Male sex, %</td>
<td>74.4</td>
<td>76.3</td>
<td>71.9</td>
</tr>
<tr>
<td>Diabetes, %</td>
<td>25.6*</td>
<td>18.5*</td>
<td>27.6</td>
</tr>
<tr>
<td>Killip 3 or 4, %</td>
<td>1.7</td>
<td>0.2</td>
<td>18.8*</td>
</tr>
<tr>
<td>In-hospital mortality, %</td>
<td>3.1</td>
<td>1.3</td>
<td>12.4*</td>
</tr>
<tr>
<td>12-month mortality, %</td>
<td>8.3</td>
<td>9.7</td>
<td>25.8</td>
</tr>
</tbody>
</table>

* P value < 0.05
Results (2)  12-month mortality

- UA

PL-ACS

Urgent revascularization
Deferred revascularization

P log-rank = 0.53

9.7%
8.3%
Results (3) 12-month mortality

- NSTEMI

![Graph showing 12-month mortality for Urgent revascularization and Deferred revascularization with 25.8% and 21.3% respectively, and P log-rank = 0.15.](image)
Results (4) 12-month mortality

- STEMI

![Graph showing cumulative proportion of deaths over days for urgent and deferred revascularization with 40.2% and 25.0% mortality at 12 months, respectively. The log-rank test P-value is 0.0056.]
Conclusion

- The rates of urgent revascularization in ACS caused by left main stem stenosis increase together with the severity of ACS
- 12-month mortality in deferred revascularization was similar to urgent in UA and NSTEMI