Myocardial infarction due to acute left circumflex (LCx) occlusion: electrocardiographic parameters, infarct size, reperfusion delay, average hospital stay and cardiovascular mortality.

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Background
Left circumflex (LCx) occlusion is underdiagnosed in most of reperfusion studies about myocardial infarction, due to its poor electrocardiographic expressiveness and late diagnosis, which leads to longer higher infarct size and reperfusion time.

Purpose
To compare peak of cardiac biomarkers, electrocardiographic abnormalities, reperfusion delay, hospital stay and survival in acute and subacute myocardial infarction, due to left anterior descending (LAD), left circumflex (LCx) or right coronary artery (RCA) occlusion.

Methods
Observational retrospective study including 1634 coronary angiographies in a single university hospital between 2016 and 2018. We analyzed clinical presentation, delay from emergency unit to invasive cardiology department, peak of markers, electrocardiographic parameters, average hospital stay and long-term mortality.

Results
873 patients (74% male; 66± 13 years) with myocardial infarction were analyzed, of which LAD, LCx and RCA were occluded in 16%, 10% and 17% respectively. 38%, 52%, and 10% of cases with LCx occlusion presented as Non-ST Segment Elevation Myocardial Infarction (NSTEMI), ST Segment Elevation Myocardial Infarction (STEMI) and subacute myocardial infarction respectively. CPK-peak was significant higher in LDA (2703 +/- 2266 IU/l) than in LCx (1555 +/- 1230 IU/l) and RCA occlusion (1720 +/- 1540 IU/l) (p<0.001). Troponin levels were also higher in LDA (53 +/- 35 ng/ml) than in LCx (37 +/- 31 ng/ml) and RCA occlusion (40 +/- 29) (p=0.002).

The most frequent ECG findings in patients with LCx occlusion were "ST depression in V1-V4 leads and ST elevation in inferior and lateral leads" (5%). Isolated ST depression in I, AVL, V4-V6 was the most frequent finding detected in NSTEMI due to LCx occlusion (sensitivity 13%; specificity 91% [97% in subacute myocardial infarction]; positive predictive value 67%, negative predictive value 45% and likelihood high rate+ 1.5).

No differences on time from symptoms onset to emergency department were detected (p=0.201), but mean time from emergency unit to invasive cardiology department arrival was 292, 1608 and 350 minutes in LDA, LCx and RCA occlusion (p<0.001). Furthermore average hospital stay was 8, 9 and 7 days respectively (p=0.281). Patients with LDA occlusion presented lower systolic function after AMI (p<0.001) and higher rate
of all-cause mortality before discharge (p=0.028). A higher rate of third degree atrioventricular block was found in RCA occlusions (p<0.001), but no differences in all-cause mortality 6 months and 1 year after AMI were found (p=0.082; p=0.080 and p=0.155).

Conclusions
Isolated ST depression in lateral leads seems to be a low sensitive but highly specific electrocardiographic parameter in subacute infarction due to LCx occlusion. Our study showed higher reperfusion delay in patients with acute LCx occlusion, which didn’t lead to higher infarct size, longer average hospital stay, nor long time all-cause mortality.

![Figure 1. Reperfusion delay and average hospital stay](image-url)