

Quadrifurcation of the left main coronary artery and acute coronary syndrome

Czwórpodział pnia lewej tętnicy wieńcowej i ostry zespół wieńcowy

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Percutaneous treatment of the left main coronary artery (LMCA) bifurcation for acute coronary syndrome (ACS) is complex and associated with poorer results as compared to simple lesions. When additional branches take off from the LMCA, percutaneous coronary intervention (PCI) may be challenging. We present two patients with ACS, in whom the culprit lesions were located at the LMCA quadrifurcation. Additionally, we propose modified Medina classification adopted for quadrifurcation lesions.

Patient 1: A 65-year-old male patient was admitted due to recurrent chest pain for one week. Electrocardiogram showed ST segment depression in precordial leads. Maximal troponin T rise was 3172 ng/L (UNL < 14). Urgent angiography revealed LMCA quadrifurcation. Eccentric stenosis involved distal LMCA and ostia of the left circumflex coronary (LCx) artery and two intermedial branches (Fig. 1). TIMI 3 flow was preserved. The next day the patient underwent coronary artery by-pass grafting. **Patient 2:** An 82-year-old male patient with a history of chronic left bundle branch block and ST elevation ACS 12 years ago, treated with primary PCI of the left anterior descending coronary artery (LAD) was admitted due to recurrent chest pain for several hours. Troponin T rise on admission was 1866 ng/L. Angiography revealed LMCA quadrifurcation with critical stenosis in LCx ostium with TIMI 2 flow (Fig. 2). After predilatation of the LCx ostium up to 40 atm., a 2.5 × 12 mm everolimus eluting stent was implanted at 20 atm. Four branches originating from the LMCA are casuistic. Atherosclerotic involvement of the LMCA quadrifurcation makes PCI challenging, although not impossible. Only single reports of PCI for LMCA quadrifurcation are available. Surgical treatment seems to be the gold standard for such lesion location in stable patients. However, ACS may force the operator towards PCI, if the lesion

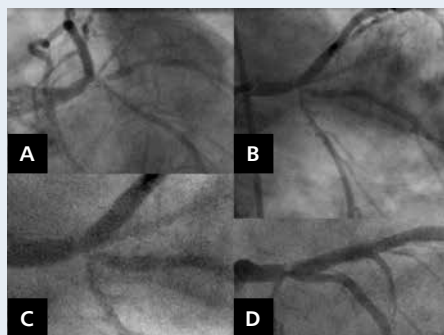


Figure 1. A–D. Significant stenosis in the left main coronary artery quadrifurcation

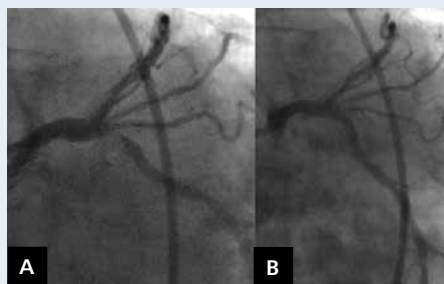


Figure 2. A. Critical stenosis of the ostium of the left circumflex coronary artery; B. Angiographic result after stent implantation

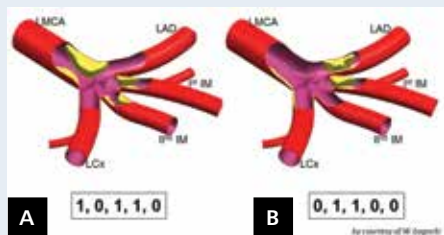


Figure 3. A, B. Scheme presenting classification of quadrifurcation lesions; IM — intermediate branch; LAD — left anterior descending coronary artery, LCx — left circumflex coronary artery; LMCA — left main coronary artery

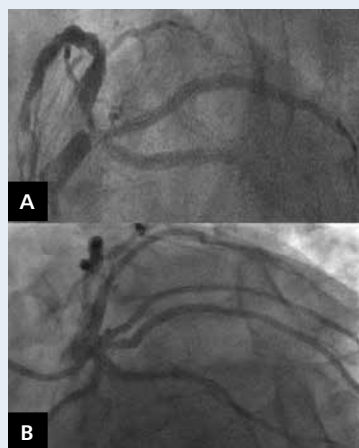


Figure 4. A. Trifurcation of the left main coronary artery with significant involvement of its distal segment and the ostium of the left anterior descending coronary artery; B. Left main coronary artery pentafurcation without significant lesions

involvement is technically favourable (as in the second patient). Next, classification of the LMCA quadrifurcation may aid the treatment strategy. As adopted from the Medina classification for bifurcation lesions, the quadrifurcation lesions may also be classified in similar way, giving a binary value (0 or 1) according to whether each of the consecutive quadrifurcation segments is compromised or not. The first digit corresponds to the LMCA, the second digit to the LAD, the third and fourth digits to the intermedial branches, and the last digit to LCx (Fig. 3). Theoretically, 32 anatomical scenarios of LMCA quadrifurcation involvement are possible. Finally, such modification of Medina classification may also serve for LMCA trifurcation or pentafurcation assessment (Fig. 4).

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