Double kissing – crush technique to treat coronary bifurcation lesions: analysis of success rate, procedural times and device usage

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Background: The Double Kissing Crush ("DK Crush") technique is one of the recommended planned 2-stent techniques to treat true coronary bifurcation lesions (Medina 1–1-1, Medina 0–1-1). While some trials demonstrated superiority to other techniques, DK Crush requires a sequence of specific and potentially technically challenging steps. No data exists on the procedural difficulty of the various steps required for DK Crush. We therefore analyzed procedural times and device usage in a systematic fashion.
Methods and results: 54 patients (42 male, mean age 67±12 years) intended for treatment with DK Crush were enrolled. Detailed procedural characteristics including exact times and device usage for each step of DK Crush were prospectively measured and analyzed.
DK Crush was successful in 48/54 patients (89%). In two patients stenting technique was changed to T- or TAP-stenting due to anatomical reasons at the moment of positioning of the SB stent. In one patient no balloon could cross the lesion and in another the procedure had to be modified due to coronary perforation directly after pre-dilatation. True failure of DK Crush was observed in two cases: In one case, the first rewiring of the SB, in the other, placement of a balloon for first kissing balloon (KB) maneuver in the SB was not possible. These 6 patients were excluded from further analysis. Median times for each step were: 1:21min (IQR 0:52min-1:50min) for wiring SB, 1:18min (IQR 0:47min-1:42min) for wiring MV, 1:30min (IQR 0:54min-2:15min) for stent placement in the SB, 0:40min (IQR 0:29min-1:21min) for balloon placement in the MV. First rewiring of the SB after SB stent crush required 1:30min (IQR 0:37min-2:05min), 1st KB placement in the SB took 1:42min (IQR 1:00min-3:13min) and 1st KB placement in the MV required 0:45min (IQR 0:27min-1:19min). Stent placement in the MV required 1:34min (IQR 1:09min-2:40min) and 2nd rewiring of the SB 1:21min (IQR 0:55min-2:04min), 2nd KB placement of the SB 2:08min (IQR 1:01min-3:36min) and 2nd KB placement of the MV 0:50min (IQR 0:34min-1:01min). Final POT was performed in all cases. Median total procedure time was 52:35 min (IQR 00:42:54h-1:01:37h). Additional devices were needed in 10% (3x1, 2x2 balloons) for stent placement in the SB; in 46% (20x1, 1x4 wires) for the first rewiring of the SB and in 49% (20x1, 3x2 balloons) for 1st KB placement in the SB. The 2nd rewiring of the SB required additional wires in 32% (13x1, 2x2 wires) and 54% of the patients required additional balloons for the 2nd KB placement in the SB (20x1, 2x2, 1x3, 2x5 balloons).
Final TIMI flow was III in 97.9%. Complications occurred in 6% (n=3), each showing coronary dissection with TIMI III flow in 2 patients and TIMI I flow in 1 patient after placement of additional stents.
Conclusion: DKMC has a high success rate but is a time-consuming and material-intensive technique. The placement of the 2nd KB in the SB requires most of the procedural time and resources.