

Letter to the editor

From “oculostenosis” to functional stability: Contemporary criteria for side branch intervention after the KISS trial

De la «oculostenosis» a la estabilidad funcional: criterios contemporáneos para la intervención de la rama lateral tras el ensayo KISS

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To the Editor:

We have read with interest the randomized KISS trial ⁽¹⁾ (Keep Bifurcation Single Stenting Simple), which compared a conservative strategy without systematic side branch (SB) intervention versus systematic SB intervention after main branch (MB) stent implantation and proximal optimization technique (POT) in non-left main bifurcations. In a cohort mainly consisting of patients with chronic coronary disease and LAD/diagonal bifurcations, the study found non-inferiority for periprocedural myocardial infarction or injury (ARC-2), as well as shorter procedure times, lower radiation and contrast use, and more SB dissections in the systematic-intervention arm. Most lesions were non-left-main, predominantly LAD-diagonal, with SBs lacking significant disease and a length of <5 mm.

We think the KISS study ⁽¹⁾ is valuable for two reasons: (i) it supports provisional stenting with POT as a central strategy, and (ii) it signals that routine SB intervention can add complexity and iatrogenic harm without clear 12-month benefits in non-complex bifurcations with a ‘stable’ SB after POT. Its interpretation, however, requires several caveats.

First, the trial had a low primary event rate (4-6%). In non-inferiority trials, lower-than-expected event rates can make results less applicable to higher-risk settings; KISS, therefore, primarily informs about the ‘stable post-POT SB’ rather than threatened or complex bifurcations.

Second, the primary endpoint—ARC-2—is biomarker-dependent (troponin) and sensitive to SB manipulation. This helps compare the ‘biological cost’ of strategies but does not replace patient-centered outcomes (angina, reintervention, long-term hard events), which matter when SB intervention aims to preserve territory.

Third, the SB-intervention arm pooled heterogeneous techniques (isolated SB balloon, kissing balloon inflation [KBI], POT variants) that were not randomized by technique. Thus, the trial’s strongest message is strategic (avoid systematic SB treatment when flow is adequate) rather than technical (which specific SB technique is best).

At this point, it is useful to align KISS with current guidelines for bifurcation management, which emphasize simplicity via a stepwise provisional strategy and adequate POT, and endorse ‘no stent in the SB by default’. After choosing a provisional approach, SB stenting should be reserved for specific clinical or angiographic conditions, consistent with European Bifurcation Club (EBC) recommendations ^(2,3):

- a. Deteriorated TIMI flow in the SB
- b. Significant stenosis (>70%) accompanied by angina and/or ECG changes; and
- c. Extensive SB dissection (> type B).

This formulation provides an operational translation that converges with KISS: the SB is treated for flow/ischemia/complication, not for isolated angiographic narrowing (avoiding ‘cosmetic revascularization’).

We propose a simple and reproducible algorithm for non-left main bifurcations treated with a provisional strategy (**Figure 1**):

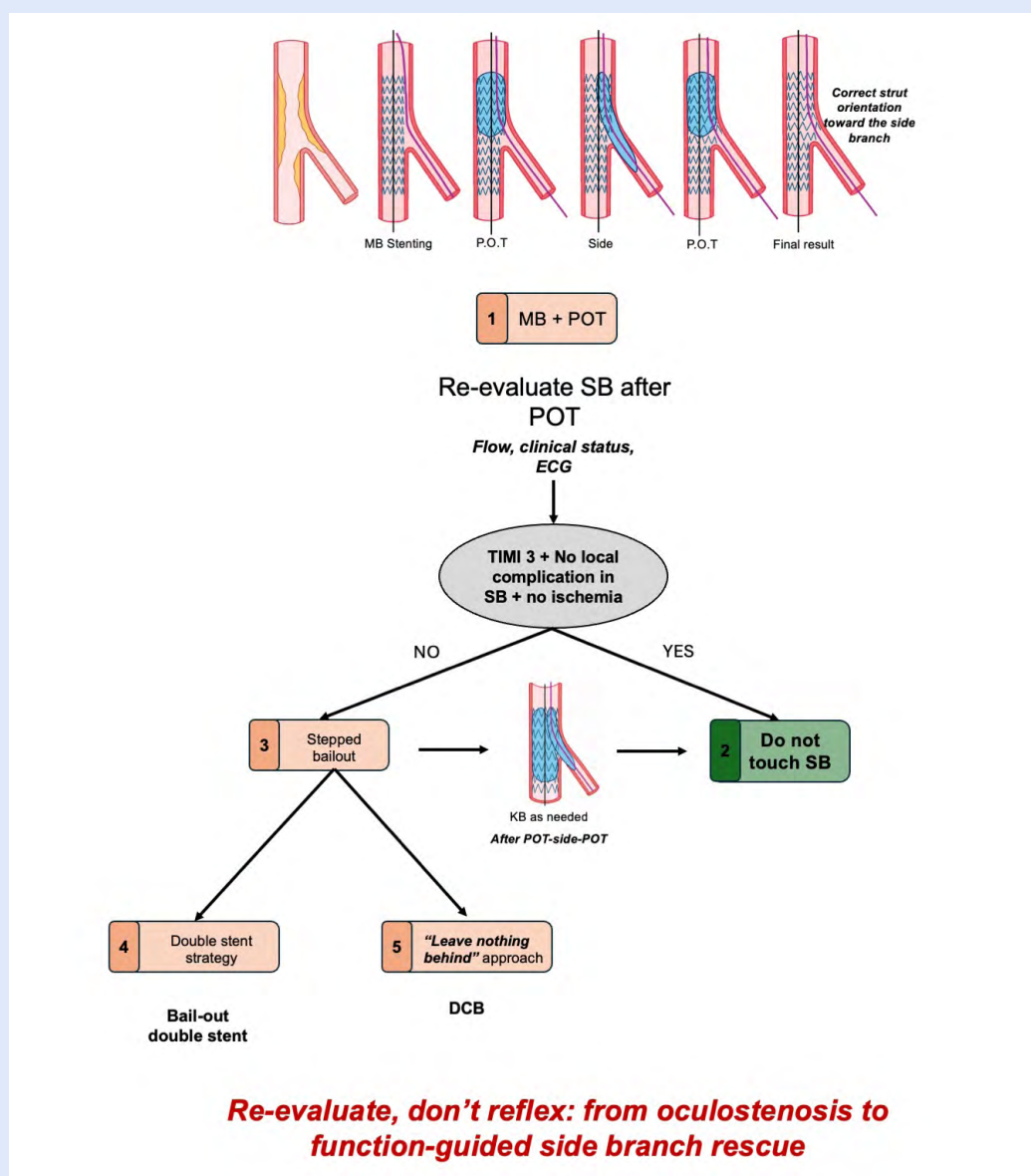


Figure 1. Proposed algorithm.

- I. **Step 1 (mandatory):** MB stent + correctly sized and positioned POT; reassess SB after POT.
- II. **Step 2 (SB Assessment and Decision):** If the SB has TIMI 3 flow, without clinical/ECG signs of ischemia or flow-limiting complications, do not intervene. However, even with severe ostial compromise (>70%) but no dissection or flow limitation, we suggest a conservative approach—continuing with provisional stenting. Ostial compromise (jailed SB), even >90%, is functionally significant only half the time by FFR, and in lesions >75%, only 27% are significant⁽⁴⁾. This occurs because visual narrowing after MB stenting often reflects carina shift—not true ostial closure. Thus, many SBs do not require rewiring or ballooning until obstruction is truly critical (>90%) or flow is compromised

(5-7). If SB intervention is chosen, proceed as outlined below.

- III. **Step 3 (stepwise bailout):** If flow deteriorates or ischemia occurs, start with the lowest-burden intervention: SB ostial ballooning and optimization (including the POT-SB-POT sequence), reserving kissing balloon inflation for selected cases. The EBC^(2,3) also stresses that the rewiring site matters: in stepwise provisional, the most favorable recross is usually distal (near the carina); in crush techniques, it should be non-distal, ideally verified with OCT if available.
- IV. **Step 4 (if SB stenting is decided:** choose an 'evidence-based' double stent strategy and not by reflex): It is important to note that the KISS trial reinforces that the provisional stent strategy should be considered the first option in the management of bifurcation lesions when

the SB is not severely compromised. However, if after MB stent implantation, significant SB compromise is evident, technical bailout options for the SB include T-stenting, TAP, or reverse culotte.

IV. Step 5 ('metal-free' alternatives when SB requires therapy but minimizing stent layers is desired): In selected scenarios where the SB requires treatment but a second stent is to be avoided a second stent, a 'leave-nothing-behind' strategy⁽⁸⁾ with a drug-coated balloon (DCB) can be considered, provided there is an acceptable angiographic result after preparation (predilation). An updated meta-analysis⁽⁹⁾ suggests a signal favoring DCB for MACE and TLR, with less late lumen loss, although individual RCTs remain limited by small sample sizes.

If an intervention with a 2-stent technique is decided, certain technical characteristics regarding SB preservation and the neocarina must be considered. In lesions with a high probability of 2 stents—especially in the left main—DK-crush is promoted as a valuable but complex strategy that must conclude with both stents implanted and final kissing balloon inflation. If DK-crush

is chosen, recent mechanistic evidence⁽¹⁰⁾ showed that wide angles (>70°) are consistently associated with worse mechanical performance and that no universally superior rewiring strategy exists. These findings support anatomy-specific planning and the use of intracoronary imaging to guide rewiring in complex double stenting.

In summary, the KISS trial shows that in non-complex bifurcations with a preserved SB after POT, the safest strategy is selective SB rescue, minimizing unnecessary instrumentation and potential damage. Future research should focus on: (i) standardizing SB rescue criteria; (ii) comparing specific strategies when intervention is needed (balloon vs. DCB vs. SB stent); (iii) defining the optimal double-stent technique according to anatomy and imaging support; and (iv) validating these approaches in complex settings like the left main and real-world practice.

Author contributions

FQC: conceptualization, research, formal analysis, writing of the original draft, revision and editing. **TC:** validation, critical review of intellectual content, writing, revision, and editing.

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