CRD summary
This review concludes that double stenting offered no added advantage in comparison with single stenting for treatment of true coronary bifurcations using drug-eluting stents. The reported evidence appeared to support the authors' conclusions. But, given the small number of studies, absence of validity assessment and potential for missed data, the authors' conclusions should be interpreted with caution.

Authors' objectives
To compare the clinical and angiographic outcomes of single versus double stenting for the treatment of true coronary bifurcation lesions using drug-eluting stents.

Searching
PubMed was searched from January 2000 to February 2009 for studies published in English. Search terms were reported. Reference lists of retrieved articles were screened for further studies.

Study selection
Studies that compared clinical and angiographic outcomes for double versus single stenting using drug-eluting stents for the treatment of true coronary bifurcation were eligible for inclusion in the review. True coronary bifurcation lesions were defined as 50% stenosis in both the main coronary vessel and side branch. Eligible studies had to follow-up patients for at least six months. Primary outcomes were side and main branch restenoses, all-cause mortality, myocardial infarction and target lesion revascularisation (TLR); secondary outcomes were postprocedural minimal luminal diameter (MLD) of side and main branches and stent thrombosis.

All except one of the included studies used sirolimus-eluting stents; one study also used rapamycin-eluting stents and paclitaxel-eluting stents and one used rapamycin-eluting stents only. The most common lesion locations were left anterior descending/diagonal bifurcation (LAD/D; 55%) and left main bifurcation (25%). Types of two stent techniques included: crush, culotte, kissing, T stenting, Y stenting and V stenting. Patients age ranged from 58 to 67 years. The proportion of men ranged from 19% to 91%. Included patients also had: diabetes (19.1% to 42%), hypertension (51% to 80%) and hyperlipidaemia (28% to 79%). Other patient characteristics were reported in the review. Studies were published between 2004 and 2009. Most studies reported the incidence of main vessel and side branch restenosis. Study duration ranged from six to 18 months. Duration of dual antiplatelet therapy ranged from three to 12 months.

The authors did not state how papers were selected for the review.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Two reviewers extracted means and standard deviations for continuous outcomes and percentage values for dichotomous outcomes. Odds ratios with 95% confidence intervals (CIs) were calculated for dichotomous outcomes.

Methods of synthesis
Studies were grouped by outcome. Pooled odds ratios and standardised mean differences (SMD) with 95% CIs were calculated using a random-effects model. Statistical heterogeneity was assessed using Q and I² statistics; significant heterogeneity was defined as a p value of less than 0.10 or an I² value of at least 50%. Sensitivity analyses were performed by using a fixed-effect model and by removal of studies from the pooled analysis one by one. Publication bias was not assessed due to the lack of included studies.

Results of the review
Five studies (n=1,145) were included in the review: three RCTs (n=526) and two controlled trials (n=619). Sample sizes ranged from 53 to 566.

Treatment using the single stent approach was associated with significantly smaller postprocedural MLD of side branch (SMD -0.71, 95% CI -0.88 to -0.54; no heterogeneity) in comparison with the double stent approach.

There were no significant differences between single and double stent approaches for side-branch restenosis (significant heterogeneity, \(I^2=76\%\)), main-branch restenosis, all-cause mortality, myocardial infarction, TLR, postprocedural MLD of main branch (significant heterogeneity, \(I^2=67\%\)), and follow-up MLD of side branch and main branch (significant heterogeneity, \(I^2=65\%\)). Sensitivity analyses did not significantly alter the review findings.

Authors’ conclusions
Double stenting appeared to offer no added advantage in comparison with single stenting for treatment of true coronary bifurcations using drug-eluting stents.

CRD commentary
This review assessed a clearly defined research question. There was some risk of missing data due to exclusion of unpublished studies and non-English language data. Some attempts to reduce reviewer error and bias were made during data extraction; it was unclear whether similar precautions were taken during study selection. It appeared that there was no validity assessment and so the reliability of the study data was unclear. Clinical and statistical heterogeneity were considered and investigated in further analyses.

Overall, the reported evidence appeared to support the authors’ conclusions. But, given the small number of studies, absence of validity assessment and potential for missed data, the authors’ conclusions should be interpreted with caution.

Implications of the review for practice and research
Practice: The authors stated that that for true coronary bifurcation lesions one stent should be implanted in the main vessel followed by balloon dilatation of the side branch.

Research: The authors stated that further well-designed studies were required that compared single and double stenting using drug-eluting stents for treatment of true bifurcation lesions. Future studies should use standardised criteria and definitions.

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