

# Revisiting: “Comparison of intravascular ultrasound versus angiography-guided drug-eluting stent implantation: a meta-analysis of one randomised trial and ten observational studies involving 19,619 patients”

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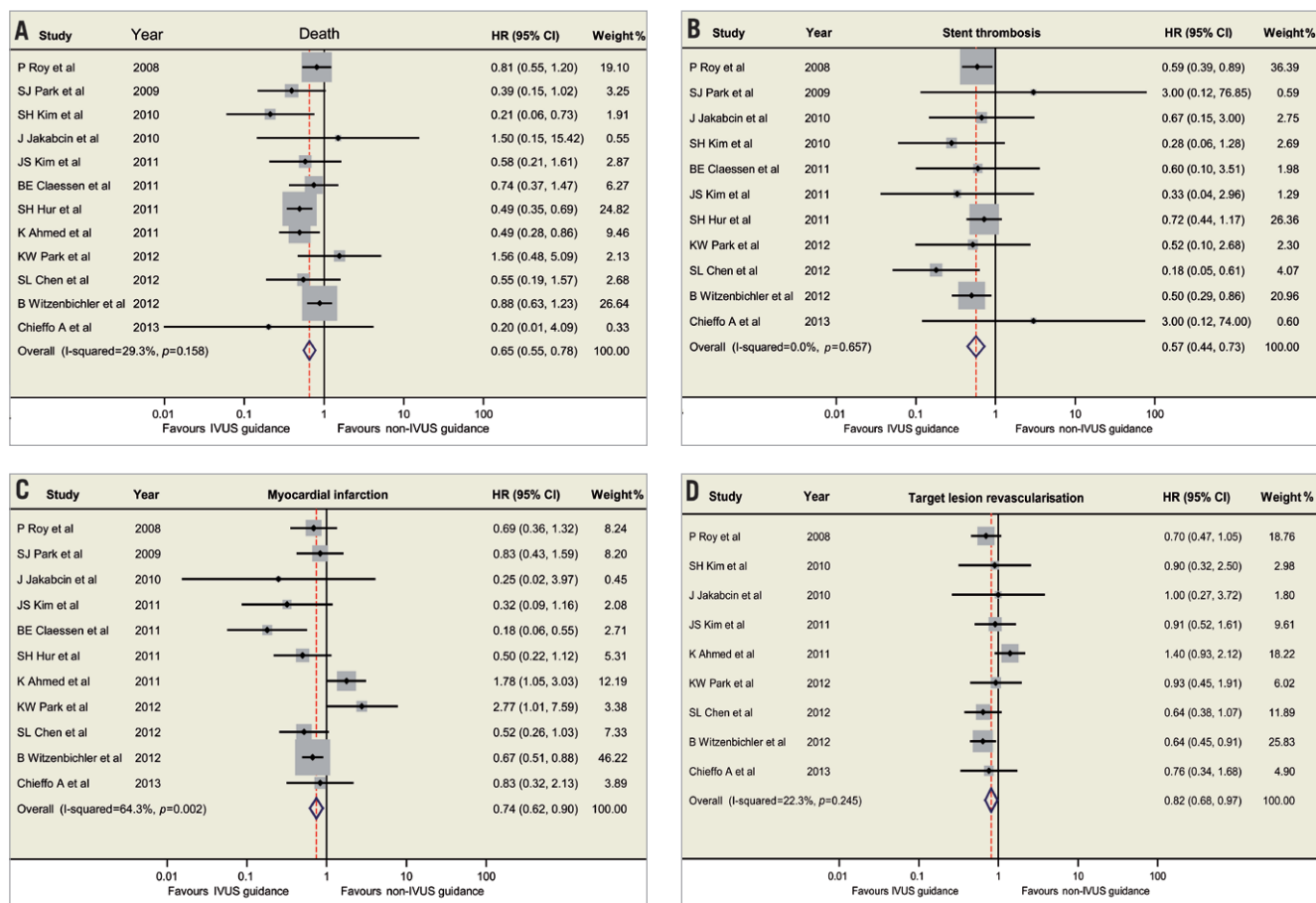
Recently, we have published the manuscript entitled “Comparison of intravascular ultrasound versus angiography-guided drug-eluting stent (DES) implantation: a meta-analysis of one randomised trial and ten observational studies involving 19,619 patients”. Two additional important studies (namely, the ADAPT-DES and the RESET), comparing IVUS- and angiography-guided DES implantation have recently been reported<sup>1,2</sup>. In addition, the two-year clinical follow-up of the randomised AVIO trial was published recently<sup>3</sup>. Therefore, our meta-analysis needs to be updated.

The ADAPT-DES (Assessment of Dual AntiPlatelet Therapy with Drug-Eluting Stents) trial was a prospective multicentre registry study that enrolled approximately 11,000 patients<sup>1</sup>. The outcomes, after IVUS-guided percutaneous coronary intervention (PCI), were compared to the non-IVUS-guided PCI group in 8,575 patients. A significant reduction in the primary endpoint of definite/probable stent thrombosis was evident in patients who underwent PCI under IVUS guidance (vs. angiography guidance) at one-year follow-up (0.52% vs. 1.04%,  $p=0.011$ ). In the pre-specified long lesion subset of the RESET (Real Safety and Efficacy of a 3-month Dual Antiplatelet Therapy Following Zotarolimus-eluting Stents Implantation) trial<sup>2</sup>, 543 patients were enrolled and randomised to either the IVUS- or angiography-guided PCI group. IVUS-guided PCI was related to a significantly

lower risk of major adverse cardiac events (MACE) at one-year follow-up compared to angiographic guidance (4.0% vs. 8.1%,  $p=0.048$ ). In the AVIO trial, no statistical differences were observed in MACE (16.9% vs. 23.2%) or target lesion revascularisation (TLR, 9.2% vs. 11.9%) between the IVUS- and angiography-guided groups<sup>3</sup>.

Based on the available data, the currently updated meta-analysis includes 14 studies involving 29,029 patients (Figure 1)<sup>1-4</sup>. The revisited meta-analysis not only confirms our previous findings that IVUS guidance was associated with reductions in death (hazard ratio [HR]: 0.66, 95% confidence interval [CI]: 0.55-0.78,  $p<0.001$ ), stent thrombosis (HR: 0.57, 95% CI: 0.44-0.73,  $p<0.001$ ), myocardial infarction (MI) (HR: 0.74, 95% CI: 0.62-0.90,  $p=0.002$ ) and MACE (HR: 0.86, 95% CI: 0.77-0.95,  $p=0.003$ ), but also shows the beneficial effect of IVUS guidance in reducing TLR (HR: 0.82, 95% CI: 0.68-0.97,  $p=0.02$ ). Since the present meta-analysis included mostly observational studies, no significant publication bias was identified using Egger’s linear regression test ( $p=0.50$  for death;  $p=0.85$  for ST;  $p=0.69$  for MI,  $p=0.33$  for MACE,  $p=0.67$  for TLR). Although the present meta-analysis supports and strengthens the previously reported results, appropriately powered randomised trials are necessary to provide robust evidence and verify the practical value of IVUS-guided DES implantation.

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**Figure 1.** Hazard ratios and forest plots for (A) death, (B) stent thrombosis, (C) myocardial infarction, and (D) target lesion revascularisation associated with IVUS- versus non-IVUS-guided drug-eluting stent implantation. CI: confidence interval; HR: hazard ratio; IVUS: intravascular ultrasound

## Conflict of interest statement

The authors have no conflicts of interest to declare.

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