

Madhavan et al. Meta-Analysis

Long-term follow-up after ultrathin vs. conventional 2nd-generation drug-eluting stents: a systematic review and meta-analysis of randomized controlled trials¹

Conclusions

- Out of 16 trials randomizing 20,701 patients and with a mean follow-up of 2.5 years, Ultrathin strut DES (U-TS) (Strut thickness $\leq 70 \mu\text{m}$) demonstrated a 15 % relative risk (RR) reduction for the 1^o EP of TLF as compared to Thin strut DES (TS), primarily driven by 25 % RR reduction in CD-TLR.
- Similar observations were made for TVF with 15 % RR reduction, primarily driven by 16 % RR reduction in CD-TVR; similar risks observed for MI, ST, cardiac death, and all-cause mortality.
- The performance of Orsiro™ SES was assessed in majority (12 out of 16) of the RCTs with U-TS compared to TS.
- The present report confirms that further reducing strut thickness to $<70 \mu\text{m}$ has a favorable effect on freedom from repeat revascularization.⁵

Study design

Random-effects meta-analysis of 16 randomized controlled trials (RCT) comparing Orsiro™ and three other ultrathin strut DES (Strut thickness $\leq 70 \mu\text{m}$) to conventional 2nd-generation DES.

Endpoints

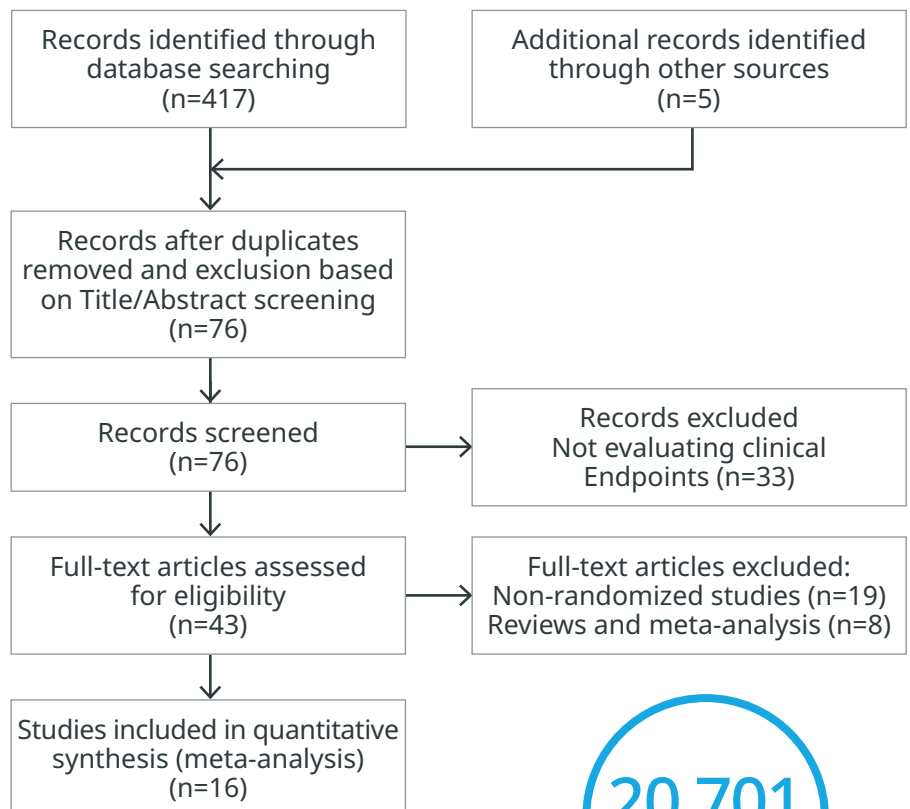
Primary endpoint

Target Lesion Failure (TLF) at latest follow-up reported, composite of:

- Cardiac death
- Target-vessel myocardial infarction (TV-MI)
- Clinically-driven target lesion revascularization (CD-TLR)

Selected secondary endpoints

- Individual components of the primary endpoint
- Target Vessel Failure (TVR)
- Clinically-driven target vessel revascularization (CD-TVR)
- Stent Thrombosis – definite and definite or probable (ST)*
- Any Myocardial Infarction (MI)
- Non-Cardiac death
- All-cause death



20,701
patients

Selected Stent characteristics²

CATEGORY	STENT NAME	STENT MANUFACTURER	METALLIC ALLOY	STRUT THICKNESS	POLYMER TYPE	DRUG NAME
U-TS	Orsiro™	Teleflex™	Cobalt-chromium	60 µm	Bioabsorbable	Sirolimus
U-TS	MiStent	MiCell Technologies	Cobalt-chromium	64 µm	Bioabsorbable	Sirolimus
U-TS	BioMime	Meril Life Sciences	Cobalt-chromium	65 µm	Bioabsorbable	Sirolimus
U-TS	Supraflex	Sahajanand Medical Technologies	Cobalt-chromium	60 µm	Bioabsorbable	Sirolimus
TS	Xience Prime/Xpedition	Abbott	Cobalt-chromium	81 µm	Durable	Everolimus
TS	Resolute Integrity	Medtronic	Cobalt-chromium	91 µm	Durable	Zotarolimus
TS	Resolute Onyx	Medtronic	Cobalt-chromium	81 µm	Durable	Zotarolimus
TS	BioFreedom	Biosensors	Stainless steel	120 µm	None	Biolimus A9
TS	Endeavor	Medtronic	Cobalt-chromium-nickel	91 µm	Durable	Zotarolimus
TS	Nobori	Terumo	Stainless steel	120 µm	Bioabsorbable	Biolimus A9

List of studies included²

STUDY ACRONYM	YEAR	N	FOLLOW-UP***	ULTRATHIN STENT TYPE	CONTROL STENT TYPE
BIOFLOW-IV	2019	575	12	Orsiro™	Xience
BIOFLOW-V	2020	1,334	36	Orsiro™	Xience
BIOFLOW-II	2018	452	60	Orsiro™	Xience
BIO-RESORT	2019	3,514	36	Orsiro™	Resolute
BIOSCIENCE	2018	2,119	60	Orsiro™	Xience
DESSOLVE III	2020	1,398	36	MiStent	Xience
ORIENT	2019	372	36	Orsiro™	Resolute Integrity
PRISON-IV	2019	330	36	Orsiro™	Xience
SORT OUT VII	2020	2,525	36	Orsiro™	Nobori
meriT-V	2018	256	9	BioMime	Xience
BIOFLOW-VI	2020	440	12	Orsiro™	Xience
BIONYX	2020	2,488	24	Orsiro™	Resolute Onyx
BIOSTEMI	2019	1,300	24	Orsiro™	Xience
SORT OUT IX	2020	3,151	12	Orsiro™	BioFreedom
TALENT	2019	1,435	24	Supraflex	Xience
DESSOLVE II	2015	184	9	MiStent	Endeavor



Orsiro™

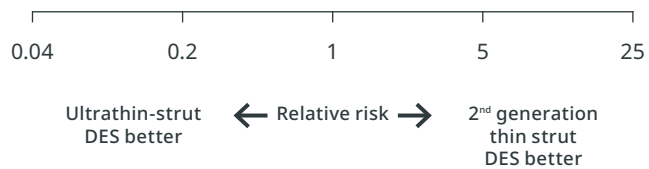
* According to Academic Research Consortium criteria

** Systematic search of the MEDLINE, Cochrane Central Register of Controlled Trials, and Embase databases from December 2010 through March 2021 for all RCTs comparing ultrathin-strut DES to conventional 2nd-generation thin-strut DES for the treatment of CAD.

*** Follow-up in months (longest follow-up provided if multiple analyses).

Risk of target lesion failure at latest follow-up – Mean 2.5-year

STUDY	YEAR	ACTIVE EVENTS	N	CONTROL EVENTS	N	WEIGHT	RELATIVE RISK [95 % CI]
DESSOLVE II	2015	11	123	5	61	1.3 %	1.09 (0.40, 3.00)
BIOFLOW-II	2018	30	298	19	154	4.0 %	0.82 (0.48, 1.40)
BIOSCIENCE	2018	198	1,063	189	1,056	17.2 %	1.04 (0.87, 1.25)
BIOFLOW-IV	2019	14	385	8	190	1.8 %	0.86 (0.37, 2.02)
BIO-RESORT	2019	77	1,169	96	1,173	10.5 %	0.80 (0.60, 1.07)
ORIENT	2019	11	250	9	122	1.8 %	0.60 (0.25, 1.40)
BIOFLOW-V	2020	70	884	59	450	8.8 %	0.60 (0.44, 0.84)
DESSOLVE III	2020	72	703	79	695	9.9 %	0.90 (0.67, 1.22)
SORT OUT VII	2020	114	1,261	115	1,264	12.6 %	0.99 (0.78, 1.27)
BIOFLOW-VI	2020	5	220	3	220	0.7 %	1.67 (0.40, 6.89)
BIONYX	2020	71	1,245	76	1,243	9.4 %	0.93 (0.68, 1.28)
SORT OUT IX	2020	59	1,579	79	1,572	8.7 %	0.74 (0.53, 1.03)
TALENT	2021	49	720	56	715	7.4 %	0.87 (0.60, 1.26)
BIOSTEMI	2021	33	649	53	651	6.1 %	0.62 (0.41, 0.95)
REML model for all studies (Q=15.24, df=13, p for heterogeneity=0.29; I ² =27.1 %)							0.85 (0.76, 0.96)
Prediction interval -0.40 - 0.09							p for overall effect=0.008



U-TS showed 15 % relative risk reduction (RRR) in TLF as compared to TS, primarily driven by 25 % RRR in CD-TLR.



Outcomes with TS are excellent and **have not been improved upon by various iterative designs** [...], in contrast, U-TS have potential advantages in terms of deliverability, are less likely to disturb flow in side-branches, and may promote more rapid endothelialization.^o

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