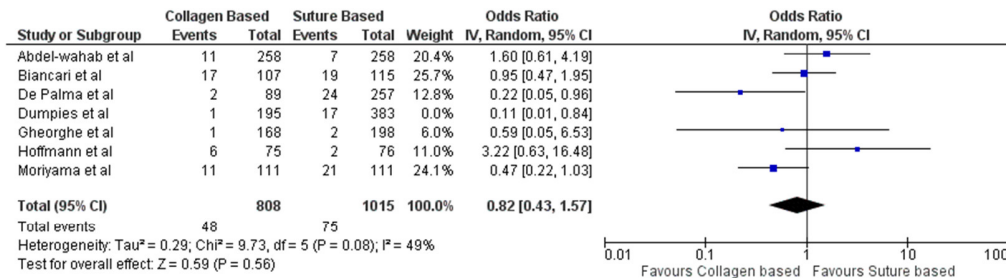
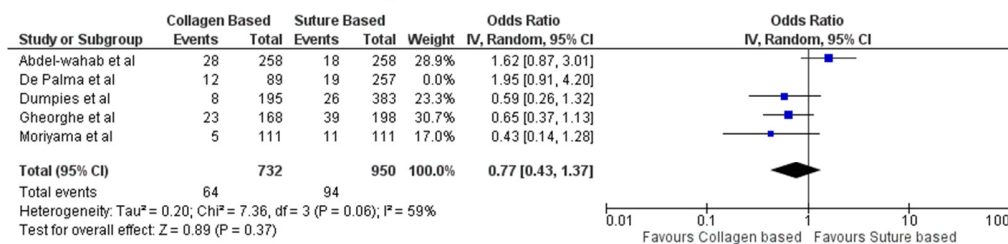


Supplementary Files

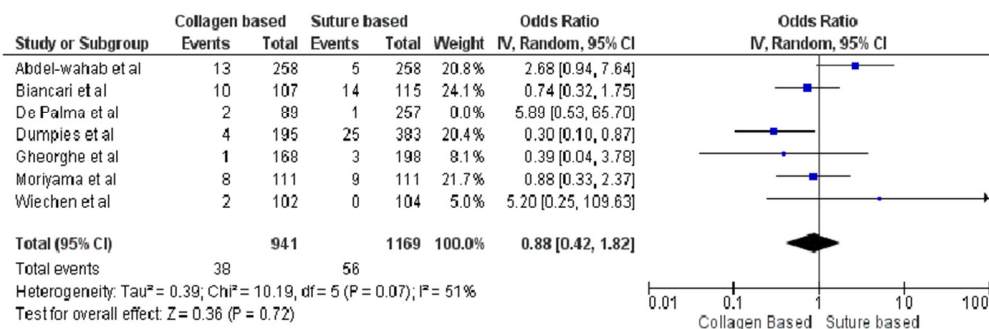
Major Bleeding Complications



Minor Bleeding Complications

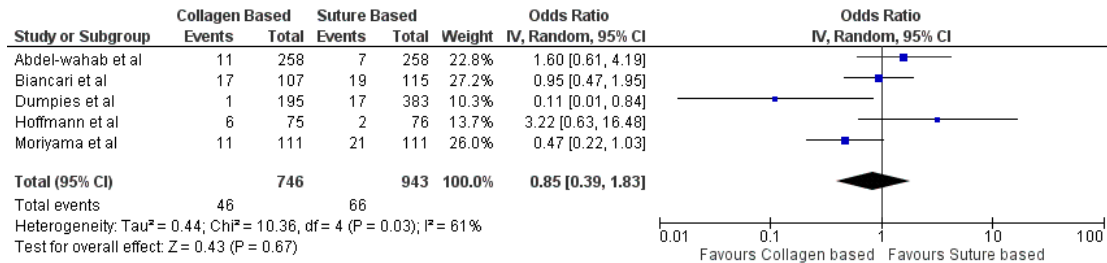


Major Vascular Complications

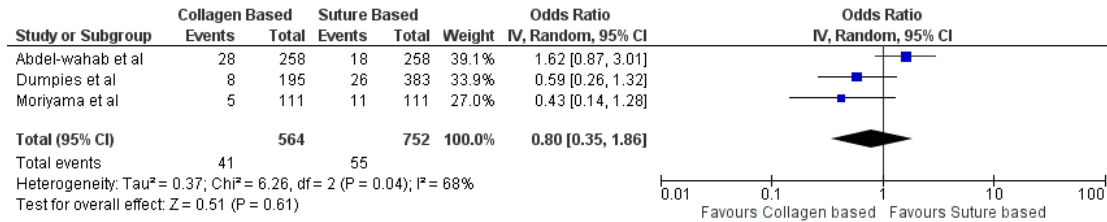


Supplementary Figure S1. Forest plot for analysis of major and minor bleeding complications (adjusted to decrease heterogeneity), CI: confidence interval, IV: Instrumental variable.

Major Bleeding Complications

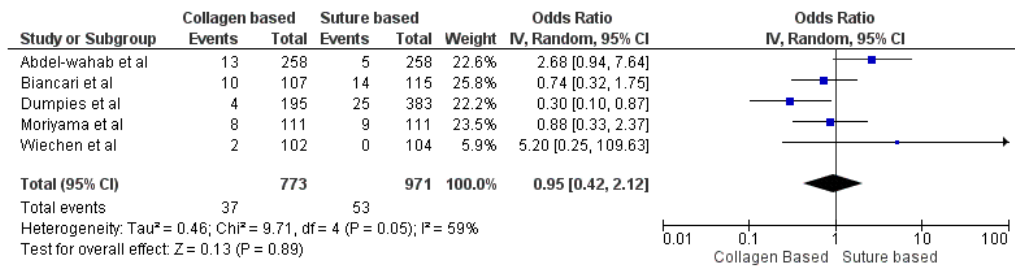


Minor Bleeding Complications

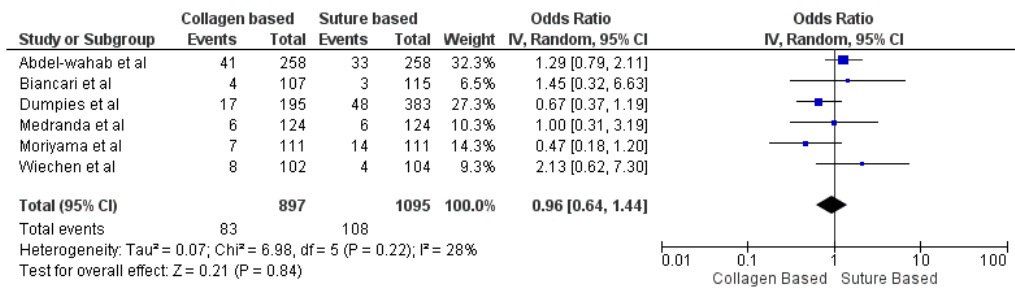


Supplementary Figure S2. Forest plot for secondary analysis of major and minor bleeding complications (excluding Prostar XL S-VCD), CI: confidence interval, IV: Instrumental variable.

Major Vascular Complications

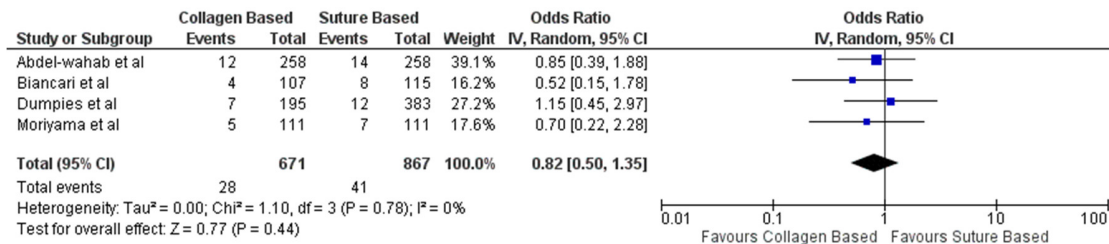


Minor Vascular Complications

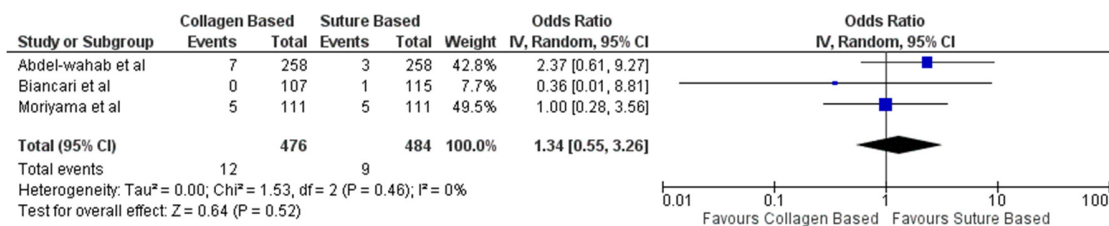


Supplementary Figure S3. Forest plot for secondary analysis of major and minor vascular complications (excluding Prostar XL S-VCD), CI: confidence interval, IV: Instrumental variable.

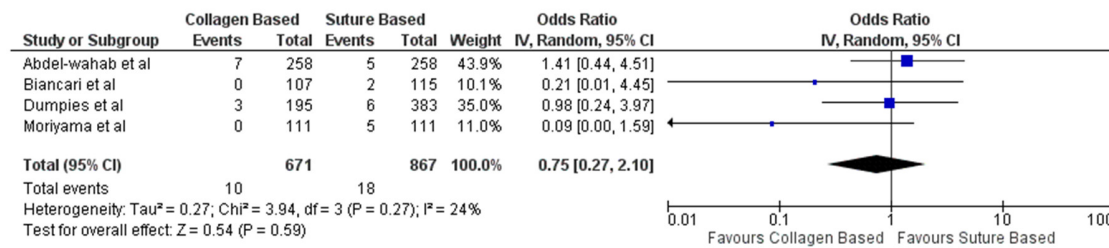
VCD Failure



Stroke



30-Day All Cause Mortality



Supplementary Figure S4. Forest plot of for secondary analysis of secondary outcomes (excluding Prostar XL S-VCD): CI: Confidence interval, IV: Instrumental variable, VCD: Vascular closure device.

Supplementary Table S1. Assignment of variables to the outcomes.

Variable name	Outcome
O1	Major Bleeding Complications
O2	Minor Bleeding Complications
O3	Major Vascular Complications
O4	Minor Vascular Complications
O5	Stroke
O6	VCD failure
O7	30-day all-cause mortality

Supplementary Table S2. Risk of bias analysis for Medranda et al for primary and secondary outcomes.

Medranda et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	NA	NA	NA	Moderate	NA	NA	NA
Selection of participants into the study	NA	NA	NA	Low	NA	NA	NA
Classification of interventions	NA	NA	NA	Low	NA	NA	NA
Deviations from intended interventions	NA	NA	NA	Moderate	NA	NA	NA
Missing data	NA	NA	NA	Low	NA	NA	NA
Measurements of outcomes	NA	NA	NA	Low	NA	NA	NA

Selection of the reported result	NA	NA	NA	Low	NA	NA	NA
Overall bias	NA	NA	NA	Moderate	NA	NA	NA

Supplementary Table S3. Risk of bias analysis for Dumpies et al for primary and secondary outcomes.

Dumpies et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	Serious	Serious	Serious	Serious	N A	Serious	Serious
Selection of participants into the study	Low	Low	Low	Low	N A	Low	Low
Classification of interventions	Low	Low	Low	Low	N A	Low	Low

Deviations from intended interventions	Moderate	Moderate	Moderate	Moderate	N A	Moderate	Moderate
Missing data	Low	Low	Low	Low	N A	Low	Low
Measurements of outcomes	Low	Low	Low	Low	N A	Low	Low
Selection of the reported result	Low	Low	Low	Low	N A	Low	Low
Overall bias	Moderate	Moderate	Moderate	Moderate	N A	Moderate	Moderate

Supplementary Table S4. Risk of bias analysis for Noriaki et al for primary and secondary outcomes.

Noriaki et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Selection of participants into the study	Low	Low	Low	Low	Low	Low	Low
Classification of interventions	Low	Low	Low	Low	Low	Low	Low
Deviations from intended interventions	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Missing data	Low	Low	Low	Low	Low	Low	Low
Measurements of outcomes	Low	Low	Low	Low	Low	Low	Low

Selection of the reported result	Low	Low	Low	Low	Low	Low	Low
Overall bias	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate

Supplementary Table S5. Risk of bias analysis for Gheroge et al for primary and secondary outcomes.

Gheorge et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	Serious	Serious	Serious	Serious	N A	Serious	Serious
Selection of participants into the study	Low	Low	Low	Low	N A	Low	Low

Classification of interventions	Low	Low	Low	Low	N A	Low	Low
Deviations from intended interventions	Moderate	Moderate	Moderate	Moderate	N A	Moderate	Moderate
Missing data	Low	Low	Low	Low	N A	Low	Low
Measurements of outcomes	Low	Low	Low	Low	N A	Low	Low
Selection of the reported result	Low	Low	Low	Low	N A	Low	Low
Overall bias	Moderate	Moderate	Moderate	Moderate	N A	Moderate	Moderate

Supplementary Table S6. Risk of bias analysis for Hoffman et al for primary and secondary outcomes.

Hoffman et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	Serious	NA	NA	NA	NA	NA	NA
Selection of participants into the study	Low	NA	NA	NA	NA	NA	NA
Classification of interventions	Low	NA	NA	NA	NA	NA	NA
Deviations from intended interventions	Moderate	NA	NA	NA	NA	NA	NA
Missing data	Low	NA	NA	NA	NA	NA	NA
Measurements of outcomes	Low	NA	NA	NA	NA	NA	NA

Selection of the reported result	Low	NA	NA	NA	NA	NA	NA
Overall bias	Moderate	NA	NA	NA	NA	NA	NA

Supplementary Table S7. Risk of bias analysis for Biancari et al for primary and secondary outcomes.

Biancari et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	NA	NA	Serious	Serious	Serious	Serious	Serious
Selection of participants into the study	NA	NA	Low	Low	Low	Low	Low
Classification of interventions	NA	NA	Low	Low	Low	Low	Low

Deviations from intended interventions	NA	NA	Moderate	Moderate	Moderate	Moderate	moderate
Missing data	NA	NA	Low	Low	Low	Low	Low
Measurements of outcomes	NA	NA	Low	Low	Low	Low	Low
Selection of the reported result	NA	NA	Low	Low	Low	Low	Low
Overall bias	NA	NA	Moderate	Moderate	Moderate	Moderate	Moderate

Supplementary Table S8. Risk of bias analysis for DePalma et al for primary and secondary outcomes.

DePalma et al							
	O1	O2	O3	O4	O5	O6	O7
Due to confounding	Serious	Serious	Serious	Serious	Serious	N A	Serious
Selection of participants into the study	Low	Low	Low	Low	Low	N A	Low
Classification of interventions	Low	Low	Low	Low	Low	N A	Low
Deviations from intended interventions	Moderate	Moderate	Moderate	Moderate	Moderate	N A	Moderate
Missing data	Low	Low	Low	Low	Low	N A	Low

Measurements of outcomes	Low	Low	Low	Low	Low	NA	Low
Selection of the reported result	Low	Low	Low	Low	Low	NA	Low
Overall bias	Moderate	Moderate	Moderate	Moderate	Moderate	NA	Moderate

Supplementary Table S9. Risk of bias analysis for Weichen et al for primary and secondary outcomes.

Wiechen et al							
	O1	O2	O3	O4	O5	O6	O7
Randomization	NA	NA	Low	Low	NA	NA	NA
Selection of participants into the study	NA	NA	Low	Low	NA	NA	NA
Deviations from intended interventions	NA	NA	Low	Low	NA	NA	NA

Missing outcome data	NA	NA	Low	Low	NA	NA	NA
Measurements of outcomes	NA	NA	Low	Low	NA	NA	NA
Selection of the reported result	NA	NA	Low	Low	NA	NA	NA
Overall bias	NA	NA	Low	Low	NA	NA	NA

Supplementary Table S10. Risk of bias analysis for Abdel-Wahab et al for primary and secondary outcomes.

Abdel-Wahab et al							
	O1	O2	O3	O4	O5	O6	O7
Randomization	Low	Low	Low	Low	Low	Low	Low
Selection of participants into the study	Low	Low	Low	Low	Low	Low	Low
Deviations from intended interventions	Low	Low	Low	Low	Low	Low	Low
Missing outcome data	Low	Low	Low	Low	Low	Low	Low
Measurements of outcomes	Low	Low	Low	Low	Low	Low	Low
Selection of the reported result	Low	Low	Low	Low	Low	Low	Low
Overall bias	Low	Low	Low	Low	Low	Low	Low

Legends:

Supplementary Figure S1: Forest plot for analysis of major and minor bleeding complications (adjusted to decrease heterogeneity), CI: confidence interval, IV: Instrumental variable

Supplementary Figure S2: Forest plot for secondary analysis of major and minor bleeding complications (excluding Prostar XL S-VCD), CI: confidence interval, IV: Instrumental variable

Supplementary Figure S3: Forest plot for secondary analysis of major and minor vascular complications (excluding Prostar XL S-VCD), CI: confidence interval, IV: Instrumental variable

Supplementary Figure S4: Forest plot of for secondary analysis of secondary outcomes (excluding Prostar XL S-VCD): CI: Confidence interval, IV: Instrumental variable, VCD: Vascular closure device.

Supplementary table S1: Assignment of variables to the outcomes.

Supplementary table S2: Risk of bias analysis for Medranda et al for primary and secondary outcomes:

Supplementary table S3: Risk of bias analysis for Dumpies et al for primary and secondary outcomes:

Supplementary table S4: Risk of bias analysis for Noriaki et al for primary and secondary outcomes:

Supplementary table S5: Risk of bias analysis for Gheroge et al for primary and secondary outcomes:

Supplementary table S6: Risk of bias analysis for Hoffman et al for primary and secondary outcomes:

Supplementary table S7: Risk of bias analysis for Biancari et al for primary and secondary outcomes:

Supplementary table S8: Risk of bias analysis for DePalma et al for primary and secondary outcomes:

Supplementary table S9: Risk of bias analysis for Weichen et al for primary and secondary outcomes:

Supplementary table S10: Risk of bias analysis for Abdel-Wahab et al for primary and secondary outcomes:

