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SUPPLEMENTAL DATA

Iliac vein stenting outcomes in non-thrombotic and thrombotic diseases: A systematic review and meta-analysis

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Table S1. PRISMA 2020 ckecklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Title
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	-
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	INTRODUCTION
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	INTRODUCTION
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Study selection
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Search strategy
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Search strategy
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Study selection
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Data extraction
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points,	Data extraction

Section and Topic	Item #	Checklist item	Location where item is reported
		analyses), and if not, the methods used to decide which results to collect.	
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Data extraction
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Quality assessment
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Data extraction
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Statistical analysis
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Statistical analysis
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Statistical analysis
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Heterogeneity assessment
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Heterogeneity assessment
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Sensitivity analysis
Reporting	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from	Publication bias

Section and Topic	Item #	Checklist item	Location where item is reported
bias assessment		reporting biases).	assessment
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Evidence quality grade assessment
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Characteristics of literatures
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Characteristics of literatures
Study characteristics	17	Cite each included study and present its characteristics.	Characteristics of literatures
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Characteristics of literatures
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table 2
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Table 3
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Table 3
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Table 3
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Table 3

Section and Topic	Item #	Checklist item	Location where item is reported
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Table 3
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Table 3
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	DISCUSSION
	23b	Discuss any limitations of the evidence included in the review.	DISCUSSION
	23c	Discuss any limitations of the review processes used.	DISCUSSION
	23d	Discuss implications of the results for practice, policy, and future research.	DISCUSSION
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Study protocol
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Study protocol
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Study protocol
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Funding
Competing interests	26	Declare any competing interests of review authors.	Conflicts of interest
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	-

Table S2. Search strings

Database	Search string
Pubmed	("iliac vein"[Title] OR "iliac venous"[Title]) AND (stent[Title] OR stenting[Title])
Cochrane Library	(”iliac vein” or “iliac venous”):ti AND (stent or stenting):ti
Web of Science	”iliac vein” or “iliac venous” (Title) and stent or stenting (Title)
Scopus	TITLE ("iliac vein" OR "iliac venous") AND TITLE (stent OR stenting)
Excerpta Medica Database	('iliac vein':ti OR 'iliac venous':ti) AND (stent:ti OR stenting:ti)

Table S3. Preoperative and intraoperative data of patients

Reference	Enrolled population	*Average age	Female, %	Limb amount	Left side, %	CEAP C0-2, %	CEAP C3-4, %	CEAP C5-6, %	Stent amount	*Stent diameter, mm	*Stent length, mm
Xue [27]	ATIVO	64.0	59.0	61	57.0	NA	NA	NA	68	8-14	40-100
Raju [28]	CIVO	52.0	66.8	304	66.8	7.9	71.7	20.4	NE	NE	NE
Jiang [29]	NIVCS	60.9	61.8	NE	NE	1.8	70.9	27.3	61	NE	NE
Jiang [29]	PIVTS	62.9	50.0	NE	NE	0	75.0	25.0	58	NE	NE
Le [11]	NIVCS	63.1	73.0	NE	NE	NE	NE	NE	NE	NE	NE
Ming [12]	ATIVO	NE	NE	NE	NE	NA	NA	NA	NE	NE	NE
Lim [30]	CIVO	63.0	46.0	115	66.1	0.0	49.6	50.4	173	NE	NE
Kim [31]	ATIVO	69.0	73.1	130	100.0	NA	NA	NA	NE	NE	NE
Satwah [32]	CIVO	57.1	77.2	NE	NE	31.5	61.3	11.2	1223	20	77.3
Alsheekh [33]	NIVCS	67.8	67.0	623	64.8	0	81.2	18.8	NE	NE	NE
Ye [34]	NIVCS	50.5	61.5	224	91.1	NE	NE	NE	227	NE	NE
Jeon [35]	ATIVO	56.7	73.3	NE	NE	NA	NA	NA	NE	NE	NE
Jiang [36]	ATIVO	62.2	58.7	NE	NE	NA	NA	NA	60	13.7	198.5
Raju [37]	CIVO	58.0	33.3	217	NE	NE	NE	NE	NE	NE	NE
Snow [38]	CIVO	55.0	66.0	627	NE	NE	NE	NE	627	NE	NE
Dasari [39]	ATIVO (pregnancy)	28.0	100.0	NE	NE	NE	NE	NE	12	14-16	NE
Kim [15]	ATIVO	51.0	50.0	44	100.0	NA	NA	NA	NE	14	NE
Abdul-Haqq [40]	NIVCS	42.4	83.3	36	97.2	13.9	77.8	8.3	NE	18.5	68.6
Abdul-Haqq [40]	PIVTS	41.9	55.3	38	81.6	0	86.9	13.2	NE	14.8	72.8

Rizvi [41]	NIVCS	72.0	NE	268	53.7	0	88.0	12.0	NE	18	NE
Kwak [14]	ATIVO	58.0	59.1	22	90.9	NA	NA	NA	27	12	30-96
Moini [13]	NIVCS	45.8	25.0	NE	NE	NE	NE	NE	129	NE	NE
Moini [13]	PIVTS	44.0	26.3	NE	NE	NE	NE	NE	150	NE	NE
Lichtenberg [42]	NIVCS	50.0	48.3	31	93.5	NE	NE	NE	37	NE	131
Lichtenberg [42]	PIVTS	61.0	60.0	54	55.6	NE	NE	NE	62	NE	151
Foegh [43]	ATIVO	47.0	86.7	NE	79.2	NA	NA	NA	53	NE	NE
Tang [16]	CIVO	66.4	65.0	71	62.0	0	56.3	43.7	NE	NE	NE
Hügel [44]	CIVO	47.4	46.3	NE	NE	NE	NE	NE	NE	NE	NE
Robertson [45]	NIVCS	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Robertson [45]	PIVTS	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Robertson [45]	ATIVO	NE	NE	NE	NE	NA	NA	NA	NE	NE	NE
Cooke [46]	CIVO	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Taha [47]	CIVO	45.2	47.5	50	70.0	0	82.0	18.0	NE	NE	NE

Abbreviations: ATIVO: Acute thrombotic iliac vein occlusion; CIVO: Chronic iliac vein occlusion; NIVCS: Non-thrombotic iliac vein compression syndrome; PIVTS: Post iliac vein thrombotic syndrome; NE: Not extracted; CEAP: Clinical, etiological, anatomical, pathophysiological (classification). NA: Not applicable. *: data was described as median or mean.

Table S4. Efficacy outcomes other than primary patency

Reference	Enrolled population	*Average follow-up period	Ulcer healing, %	Edema relief, %	Pain relief, %	QoL improvement, %	*Average rVCSS reduction
Xue [27]	ATIVO	31mo	NE	NE	NE	NE	NE
Raju [28]	CIVO	2y	62.0	Y	Y	46.6	NE
Jiang [29]	NIVCS	3y	NE	NE	NE	NE	NE
Jiang [29]	PIVTS	3y	NE	NE	NE	NE	NE
Le [11]	NIVCS	3y	NE	NE	NE	NE	NE
Ming [12]	ATIVO	NE	NE	NE	NE	NE	NE
Lim [30]	CIVO	NE	NE	NE	Y	NE	5.75
Kim [31]	ATIVO	14mo	NE	NE	NE	NE	NE
Satwah [32]	CIVO	NE	NE	NE	NE	NE	NE
Alsheekh [33]	NIVCS	1y	NE	NE	NE	NE	NE
Ye [34]	NIVCS	4y	82.3	89.1	Y	Y	NE
Jeon [35]	ATIVO	1y	NE	NE	NE	NE	NE
Jiang [36]	ATIVO	2y	NE	NE	NE	NE	NE
Raju [37]	CIVO	2y	NE	NE	NE	NE	NE
Snow [38]	CIVO	NE	NE	NE	NE	NE	NE
Dasari [39]	ATIVO (pregnancy)	63mo	NE	NE	NE	NE	NE
Kim [15]	ATIVO	25mo	NE	NE	NE	NE	NE
Abdul-Haqq [40]	NIVCS	20mo	NE	NE	NE	NE	NE
Abdul-Haqq [40]	PIVTS	20mo	NE	NE	NE	NE	NE
Rizvi [41]	NIVCS	499d	NE	NE	NE	NE	NE

Kwak [14]	ATIVO	21mo	NE	NE	NE	NE	NE
Moini [13]	NIVCS	6mo	42.4	100	100	NE	4.72
Moini [13]	PIVTS	6mo	31.0	96.0	98.7	NE	7.77
Lichtenberg [42]	NIVCS	24mo	100	NE	NE	NE	Y
Lichtenberg [42]	PIVTS	24mo	100	NE	NE	NE	Y
Foegh [43]	ATIVO	13y	NE	NE	NE	NE	NE
Tang [16]	CIVO	29mo	100	NE	Y	Y	Y
Hügel [44]	CIVO	41mo	NE	NE	NE	NE	NE
Robertson [45]	NIVCS	6mo	NE	NE	NE	NE	NE
Robertson [45]	PIVTS	6mo	NE	NE	NE	NE	NE
Robertson [45]	ATIVO	6mo	NE	NE	NE	NE	NE
Cooke [46]	CIVO	6mo	NE	80.0	NE	NE	NE
Taha [47]	CIVO	17mo	100	NE	NE	Y	Y

Abbreviations: ATIVO: Acute thrombotic iliac vein occlusion; CIVO: Chronic iliac vein occlusion; NIVCS: Non-thrombotic iliac vein compression syndrome; PIVTS: Post iliac vein thrombotic syndrome; mo: Months; y: Year (s); NE: Not extracted; d: Days; Y: Yes: that is: compared to pre-operative data: post-operative data showed statistical difference: with a *p* value less than 0.05; QoL: Quality of life; rVCSS: Revised venous clinical severity score. *: data was described as range, median, or mean.

Table S5. Safety outcomes

Reference	Enrolled population	*Average follow-up period	Back pain, %	Pulmonary embolism, %	All cause death, %	Stent thrombosis, %	Stent migration, %	Stent fracture, %	Stent collapse, %	Contralateral DVT, %	Ipsilateral DVT*, %	PTS, %
Xue [27]	ATIVO	31mo	1.6	NE	3.3	0	0	NE	NE	NE	NE	11.5
Raju [28]	CIVO	2y	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Jiang [29]	NIVCS	3y	60.0	0	NE	NE	0	0	NE	NE	NE	NE
Jiang [29]	PIVTS	3y	50.0	0	NE	NE	0	0	NE	NE	NE	NE
Le [11]	NIVCS	3y	NE	NE	NE	NE	NE	NE	NE	9.0	NE	NE
Ming [12]	ATIVO	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	21.6
Lim [30]	CIVO	NE	NE	NE	NE	4.3	NE	NE	NE	NE	NE	NE
Kim [31]	ATIVO	14mo	NE	NE	NE	NE	NE	NE	NE	5.4	8.5	NE
Satwah [32]	CIVO	NE	NE	NE	0	NE	NE	NE	NE	NE	NE	NE
Alsheekh [33]	NIVCS	1y	NE	NE	NE	0	NE	NE	NE	NE	NE	NE
Ye [34]	NIVCS	4y	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Jeon [35]	ATIVO	1y	NE	NE	NE	NE	NE	NE	3.3	NE	NE	NE
Jiang [36]	ATIVO	2y	NE	0	NE	NE	NE	NE	NE	NE	NE	2.2
Raju [37]	CIVO	2y	25.0	NE	0	3.7	NE	NE	NE	NE	NE	NE
Snow [38]	CIVO	NE	66.0	NE	NE	NE	NE	NE	NE	NE	NE	NE
Dasari [39]	ATIVO (pregnancy)	63mo	NE	NE	NE	NE	NE	NE	9.1	NE	NE	NE
Kim [15]	ATIVO	25mo	NE	NE	NE	NE	NE	NE	NE	11.4	NE	NE
Abdul-Haqq [40]	NIVCS	20mo	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Abdul-Haqq [40]	PIVTS	20mo	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Rizvi [41]	NIVCS	499d	NE	NE	NE	1.5	NE	NE	NE	NE	NE	NE
Kwak [14]	ATIVO	21mo	NE	NE	4.5	4.5	4.5	NE	NE	NE	NE	NE
Moini [13]	NIVCS	6mo	NE	NE	NE	1.3	NE	NE	NE	NE	NE	NE
Moini [13]	PIVTS	6mo	NE	NE	NE	10.2	NE	NE	NE	NE	NE	NE
Lichtenberg [42]	NIVCS	24mo	NE	NE	0	NE	0	NE	NE	NE	0	NE
Lichtenberg [42]	PIVTS	24mo	NE	NE	0	NE	0	NE	NE	NE	0	NE
Foegh [43]	ATIVO	13y	NE	NE	NE	NE	NE	1.9	11.3	NE	NE	NE
Tang [16]	CIVO	29mo	NE	0	1.7	0	0	0	NE	0	0	NE
Hügel [44]	CIVO	41mo	NE	0	0	NE	0	0.9	NE	NE	NE	NE
Robertson [45]	NIVCS	6mo	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Robertson [45]	PIVTS	6mo	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Robertson [45]	ATIVO	6mo	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Cooke [46]	CIVO	6mo	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Taha [47]	CIVO	17mo	NE	0	NE	NE	0	0	NE	NE	NE	NE

Abbreviations: ATIVO: Acute thrombotic iliac vein occlusion; CIVO: Chronic iliac vein occlusion; NIVCS: Non-thrombotic iliac vein compression syndrome; PIVTS: Post iliac vein thrombotic syndrome; mo: Months; y: Year (s); NE: Not extracted; d: Days; DVT: Deep vein thrombosis; PTS: Post-thrombotic syndrome. *: For patients with thrombotic iliac vein compression syndrome: this variable was defined as ipsilateral lower extremity deep vein thrombosis recurrence. *: data was described as median or mean.