Bone & Joint Open

Supplementary Material

10.1302/2633-1462.53.BJO-2023-0133.R1

Appendix

Table i. PRISMA NMA checklist of items to include when reporting a systematic review involving a network meta-analysis

Section/Topic	Item #	Checklist Item	Reported on Page #
TITLE			
Title	1	Identify the report as a systematic review *incorporating a network meta-analysis (or related form of meta-analysis).*	1,4 Introduction (3rd paragraph)
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: **Background:** main objectives **Methods:** data sources; study eligibility criteria, participants, and interventions; study appraisal; and *synthesis methods, such as network meta-analysis.* **Results:** number of studies and participants identified; summary estimates with corresponding confidence/credible intervals; *treatment rankings may also be discussed. Authors may choose to summarize pairwise comparisons against a chosen treatment included in their analyses for brevity.* **Discussion/Conclusions:** limitations; conclusions and implications of findings. **Other:** primary source of funding; systematic review registration number with registry name.	2, Abstract section
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known*, including mention of why a network meta-analysis has been conducted.*	3-4, Introduction(2nd , 3rd paragraph)
Objectives	4	Provide an explicit statement of questions being addressed, with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	3-4, Introduction(3rd paragraph); Supplementary Table 2
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists and if and where it can be accessed (e.g., Web address); and, if available, provide registration information, including registration number.	5, Method(1st paragraph) Supplementary Table 2
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale. *Clearly describe eligible treatments included in the treatment network, and note whether any have been clustered or merged into the same node (with justification).*	5, Method(2nd paragraph) Supplementary Table 2
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5, Method(1st paragraph) Supplementary Table 2

Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	5, Method(1st paragraph); Supplementary Table 2.
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5, Method(3rdparagraph); Figure 1; Supplementary Table 2-3
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	6, Method(4th -5th paragraph) Supplementary Table 2
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5-6, Method(6th paragraph) Supplementary Table 2
Geometry of the network	**S1**	Describe methods used to explore the geometry of the treatment network under study and potential biases related to it. This should include how the evidence base has been graphically summarized for presentation, and what characteristics were compiled and used to describe the evidence base to readers.	*6, Method(7th paragraph)*
Risk of bias within individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6, Method(6th paragraph)
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means). *Also describe the use of additional summary measures assessed, such as treatment rankings and surface under the cumulative ranking curve (SUCRA) values, as well as modified approaches used to present summary findings from meta-analyses.*	6, Method(7th paragraph)
Planned methods of analysis	14	Describe the methods of handling data and combining results of studies for each network meta-analysis. This should include, but not be limited to: • *Handling of multi-arm trials;* • *Selection of variance structure;* • *Selection of prior distributions in Bayesian analyses; and* • *Assessment of model fit.*	*5-6, Method(4-7th paragraph)*
Assessment of Inconsistency	**S2**	Describe the statistical methods used to evaluate the agreement of direct and indirect evidence in the treatment network(s) studied. Describe efforts taken to address its presence when found.	*6, Method(7th paragraph)*
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	*6, Method(6th paragraph)*
Additional analyses	16	Describe methods of additional analyses if done, indicating which were pre-specified. This may include, but not be limited to, the following: • Sensitivity or subgroup analyses; • Meta-regression analyses; • *Alternative formulations of the treatment network; and* • *Use of alternative prior distributions for Bayesian analyses (if applicable).*	*6, Method(7th paragraph)*

RESULTS†			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	9, Result(1st paragraph); Figure 1
Presentation of network structure	**S3**	Provide a network graph of the included studies to enable visualization of the geometry of the treatment network.	9, Result(3st paragraph); Figure 2
Summary of network geometry	**S4**	Provide a brief overview of characteristics of the treatment network. This may include commentary on the abundance of trials and randomized patients for the different interventions and pairwise comparisons in the network, gaps of evidence in the treatment network, and potential biases reflected by the network structure.	9, Result(1st paragraph); Table 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	9, Result(1st paragraph); Table 1
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment.	11, Result; Supplementary Table 4
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: 1) simple summary data for each intervention group, and 2) effect estimates and confidence intervals. *Modified approaches may be needed to deal with information from larger networks.*	9, Result(1st paragraph); Table 1
Synthesis of results	21	Present results of each meta-analysis done, including confidence/credible intervals. *In larger networks, authors may focus on comparisons versus a particular comparator (e.g. placebo or standard care), with full findings presented in an appendix. League tables and forest plots may be considered to summarize pairwise comparisons.* If additional summary measures were explored (such as treatment rankings), these should also be presented.	10-11, Result(3rd-4th paragraph); Table 2; Figure 3; Supplementary Figure 2,4,5; Supplementary Table 5
Exploration for inconsistency	**S5**	Describe results from investigations of inconsistency. This may include such information as measures of model fit to compare consistency and inconsistency models, *P* values from statistical tests, or summary of inconsistency estimates from different parts of the treatment network.	12, Result(7th paragraph); Supplementary Table 8
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies for the evidence base being studied.	10-11; Supplementary Figure 3; Supplementary Table 6, 8
Results of additional analyses	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression analyses, *alternative network geometries studied, alternative choice of prior distributions for Bayesian analyses,* and so forth).	12, Result; Supplementary Table 7
DISCUSSION			
Summary of evidence	24	Summarize the main findings, including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy-makers).	13, Discussion(1-5th paragraph); Table 2.

Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias). *Comment on the validity of the assumptions, such as transitivity and consistency. Comment on any concerns regarding network geometry (e.g., avoidance of certain comparisons).*	15-16, Discussion(6th paragraph)
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	11, 15-16; discussion, and conclusion section
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. This should also include information regarding whether funding has been received from manufacturers of treatments in the network and/or whether some of the authors are content experts with professional conflicts of interest that could affect use of treatments in the network.	Title page, Declarations section

PICOS = population, intervention, comparators, outcomes, study design.

* Text in italics indicate wording specific to reporting of network meta-analyses that has been added to guidance from the PRISMA statement.

† Authors may wish to plan for use of appendices to present all relevant information in full detail for items in this section.

Table ii. Protocol and search strategies (PROSPERO Registration number: CRD42023388516)

(A) PICOS, inclusion and exclusion criteria

Patient	Patients with a posterior malleolar fracture.
Intervention	Percutaneous anteroposterior (A-P) screw fixation, open posteroanterior (P-A) screw fixation, and open posterior plate fixation
Comparator	The posteroanterior screw technique will be most commonly used as the control group.
Outcomes	Postoperative clinical and radiological outcomes were assessed. 1. Clinical outcomes: pain scores, using the Visual Analogue Score (VAS), and functional changes, as measured by the American Orthopedic Foot and Ankle Score (AOFAS), limitation of range of motion (a loss of ankle dorsiflexion ≥ 5 degrees), and complications (infection rate and peroneal nerve injury rate) 2. Radiographic outcomes: post-operative articular step-off ≥ 2mm and the progression in osteoarthritis grade
Study design	This review encompasses studies employing prospective or retrospective designs.
Inclusion criteria	The studies that investigate the comparative efficacy of distinct fixation approaches in patients with PMFs, such as the use of A-P screws, P-A screws, and plates, were included.
Exclusion criteria	Single-arm trials, pediatric trials, case reports, studies with unknown/incomplete outcomes, duplicate data, stress/open/pathologic fractures, and unclear implant usage or outcome measurements were excluded.

(B) Search vocabulary

Database	#	Search syntax
Embase	1	((malleol* OR ankle*) NEAR/3 (fracture* OR injur*)):ti,ab,kw,de
	2	'trimalleolus fracture'/exp OR 'posterior malleolus fracture'/exp 'trimalleolar fracture'/exp OR 'posterior malleolar fracture'/exp OR 'ankle fracture'/de OR 'ankle injury'/de
	3	(((fracture* OR bone*) NEAR/3 fixation*) OR osteosynthes* OR osteo-synthes*):ti,ab,kw,de
	4	'fracture fixation'/exp
	5	(#1 OR #2) AND (#3 OR #4) AND [embase]/lim
MEDLINE (Ovid)	1	((malleol* OR ankle*) ADJ3 (fracture* OR injur*)).mp
	2	"posterior malleolus fractures"/ OR "trimalleolus fractures"/ OR "posterior malleolar fractures"/ OR "trimalleolar fractures"/ OR "ankle fractures"/ OR "ankle Injuries"/
	3	(((fracture* OR bone*) ADJ3 fixation*) OR osteosynthes* OR osteo-synthes*).mp
	4	exp "Fracture Fixation"/
	5	(1 OR 2) AND (3 OR 4)
Scopus	1	**TITLE-ABS-KEY** ((malleol* OR ankle*) W/2 (fracture* OR injur*))
	2	**TITLE-ABS-KEY** (((fracture* OR bone*) W/2 fixation*) OR osteosynthes* OR osteo-synthes*)
	3	#1 AND #2

Table iii. Excluded studies and reasons

- **Studies regarding the concern about fixation or non-fixation for posterior malleolar fracture**
  - Guo J, Liu L, Yang Z, et al. The treatment options for posterior malleolar fractures in tibial spiral fractures. *International Orthopaedics* 2017; 41(9):1935-1943.
- **Studies on posterior malleolar fracture fixation lacking outcomes regarding various implant comparisons**
  - Karaca S, Enercan M, Özdemir G, et al. Importance of fixation of posterior malleolus fracture in trimalleolar fractures: A retrospective study. *Ulusal Travma ve Acil Cerrahi Dergisi* 2016; 22(6):553-558.
  - Li YD, Liu SM, Jia JS, Zhou JL. Choice of internal fixation methods for posterior malleolus fracture in both biomechanics and clinical application. Journal of Peking University Health sciences 2011; 43(5): 718-23. (Comparing groups with different fracture size with two different fixation methods)
  - Yang L, Yin G, Zhu J, et al. Posterolateral approach for posterior malleolus fixation in ankle fractures: functional and radiological outcome based on Bartonicek classification. *Archives of Orthopaedic and Trauma Surgery* 2022.
  - Zhou, Q., Lu, H., Wang, Z., Yu, S., & Zhang, H. (2017). Posterolateral Approach with Buttress Plates and Cannulated Screw Fixation for Large Posterior Malleolus Fractures. The Journal of foot and ankle surgery: official publication of the American College of Foot and Ankle Surgeons, 56(6), 1173–1179.
- **Studies on posterior malleolar fractures lacking primary or secondary outcome measurements**
  - Li M, Collier RC, Hill BW, et al. Comparing Different Surgical Techniques for Addressing the Posterior Malleolus in Supination External Rotation Ankle Fractures and the Need for Syndesmotic Screw Fixation. *Journal of Foot and Ankle Surgery* 2017; 56(4):730-734.
  - Verhage SM, Leijdesdorff A, Schipper IB, et al. Open reduction and internal fixation of the posterior malleolus fragment via the posterolateral approach is radiologically superior to 'A to P' screw fixation. *Foot* 2022; 51.
- **Studies on posterior malleolar fractures solely comparing surgical approaches, without providing specific outcomes for individual implant efficacy**
  - Shi H-F, Xiong J, Chen Y-X, et al. Comparison of the direct and indirect reduction techniques during the surgical management of posterior malleolar

fractures. *BMC musculoskeletal disorders* 2017; 18(1):109.

- **Studies on posterior malleolar fractures with insufficient data available for extraction**
  - Tosun B, Selek O, Gok U, et al. Posterior malleolus fractures in trimalleolar ankle fractures: Malleolus versus transyndesmal fixation. Indian Journal of Orthopaedics, Vol. 52, 2018. pp. 309-314.
  - Weigelt L, Hasler J, Flury A, et al. Clinical and radiological mid- to long-term results after direct fixation of posterior malleolar fractures through a posterolateral approach. *Archives of Orthopaedic and Trauma Surgery* 2020; 140(11):1641-1647.

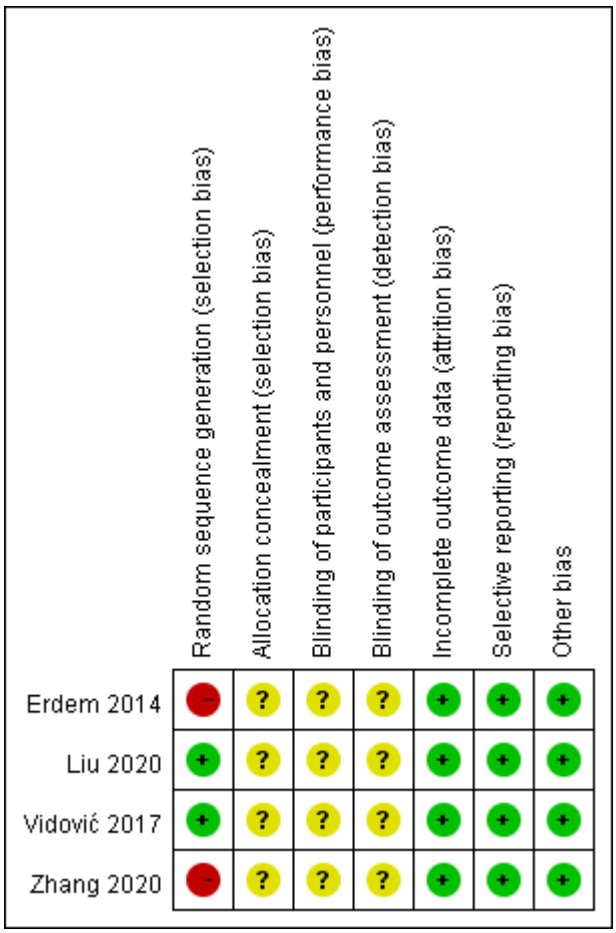
Table iv. Risk of bias assessment

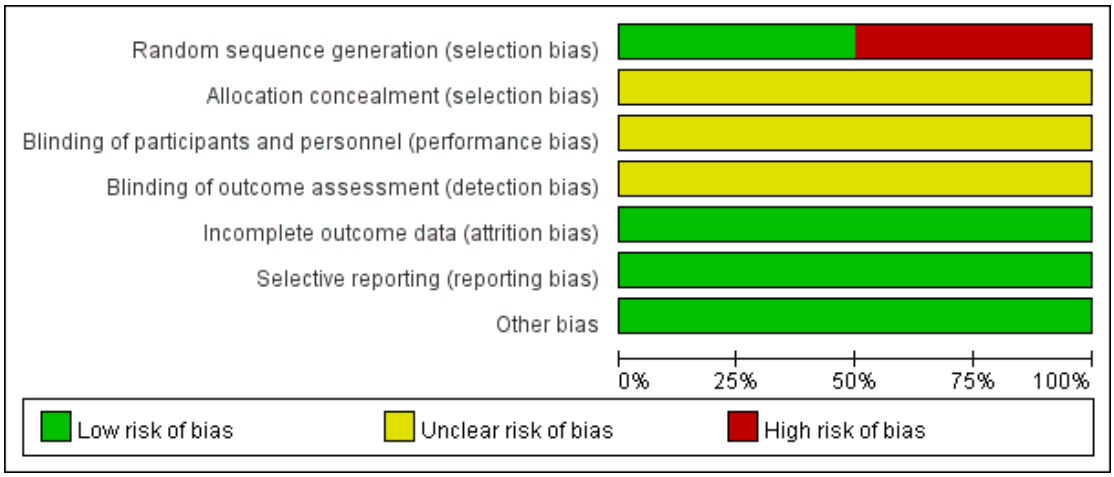
(A) General descriptions

Study ID	Notes for risk of bias assessment
Randomized controlled trials	
Erdem (2014)	Non-standardized randomization: Fixation type was randomly assigned based on presentation order. Unclear: Allocation concealment, blinding of participants, and blinding of outcome assessment.
Vidović (2017)	Unclear: Allocation concealment, blinding of participants, and blinding of outcome assessment.
Liu (2020)	Unclear: Allocation concealment, blinding of participants, and blinding of outcome assessment.
Zhang (2020)	Non-standardized randomization: Fixation type was randomly assigned based on presentation order. Unclear: Allocation concealment, blinding of participants, and blinding of outcome assessment.
Retrospective comparative studies	
Huber (1996)	Confounding and selection bias arise from the differential assessment of study and comparison groups across different time periods. Unclear: Bias due to deviations from intended intervention, bias of missing data, bias in measurement of outcomes and bias of selection of the reported result.
Kalem (2018)	Confounding, selection and missing data biases arise due to the loss of follow-up for several patients included in the study and the selection of interventions based on the surgeon's preference for each patient. Unclear: Bias due to deviations from intended intervention, bias in measurement of outcomes, and bias of selection of the reported result.
Ma (2021)	Unclear: Bias due to confounding, bias in selection of participants in the study, bias due to deviations from intended intervention, bias of missing data, and bias of selection of the reported result.
Neumann (2022)	Unclear: Bias due to confounding, bias in selection of participants in the study, bias due to deviations from intended intervention, bias of missing data, bias in measurement of outcomes, and bias of selection of the reported result.
O'Connor (2015)	Selection bias arises from patient selection based on database coding in the institute. Unclear: Bias in selection of participants in the study, bias due to deviations from intended intervention, bias of missing data, bias in measurement of outcomes, and bias of selection of the reported result.
Yu (2021)	Unclear: Bias due to confounding, bias in selection of participants in the study, bias due to deviations from intended intervention, bias of missing data, bias in measurement of outcomes and bias of selection of the reported result
Wang (2020)	Unclear: Bias due to confounding, bias in selection of participants in the study, bias due to deviations from intended intervention,

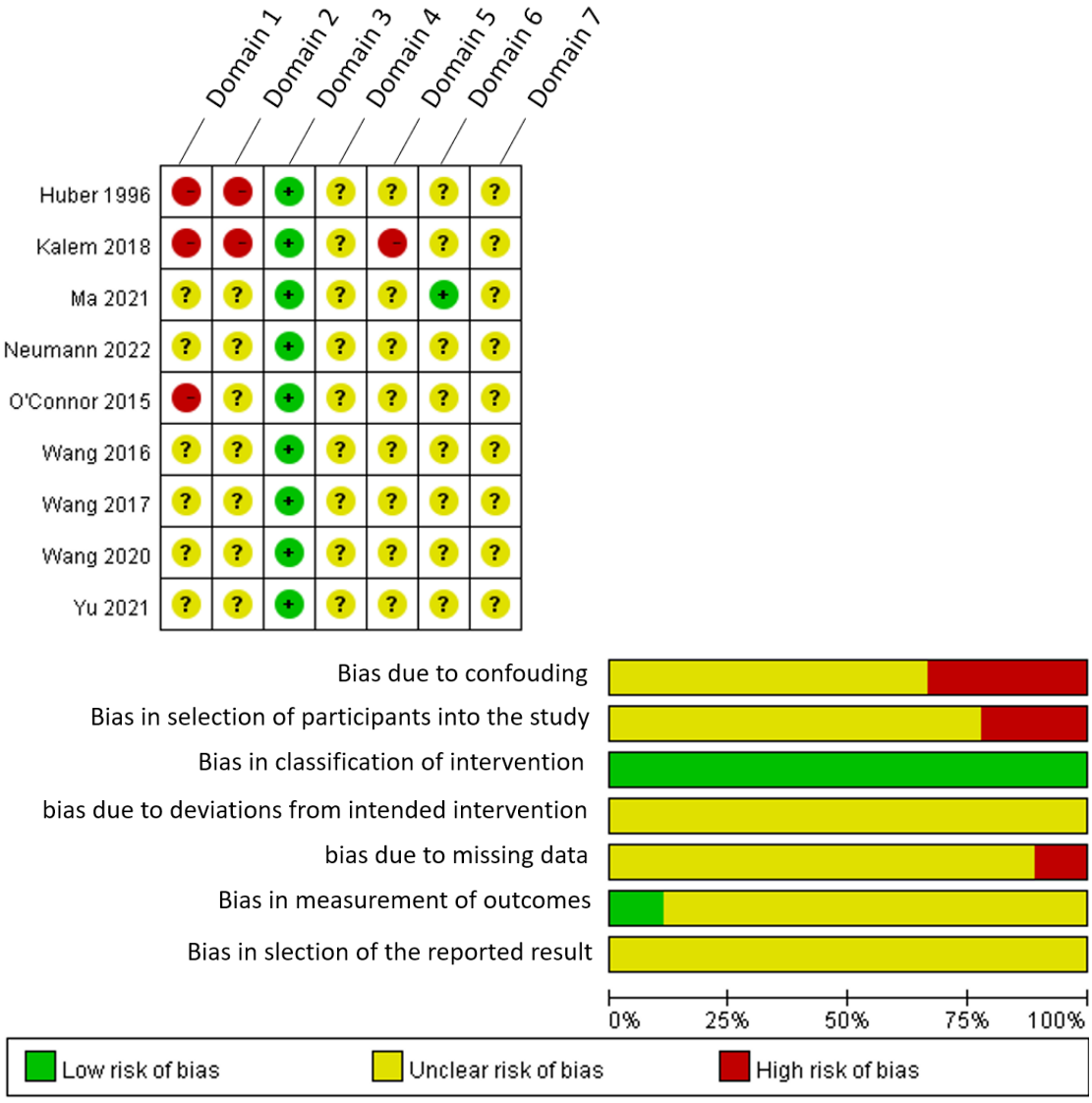
	bias of missing data, bias in measurement of outcomes, and bias of selection of the reported result.
Wang (2017)	Unclear: Bias due to confounding, bias in selection of participants in the study, bias due to deviations from intended intervention, bias of missing data, bias in measurement of outcomes and bias of selection of the reported result.
Wang (2016)	Unclear: Bias due to confounding, bias in selection of participants in the study, bias due to deviations from intended intervention, bias of missing data, bias in measurement of outcomes and bias of selection of the reported result.

(B) Risk of bias assessment for individual domains of randomized controlled trials





(C) Risk of bias assessment for individual domains of retrospective comparative studies

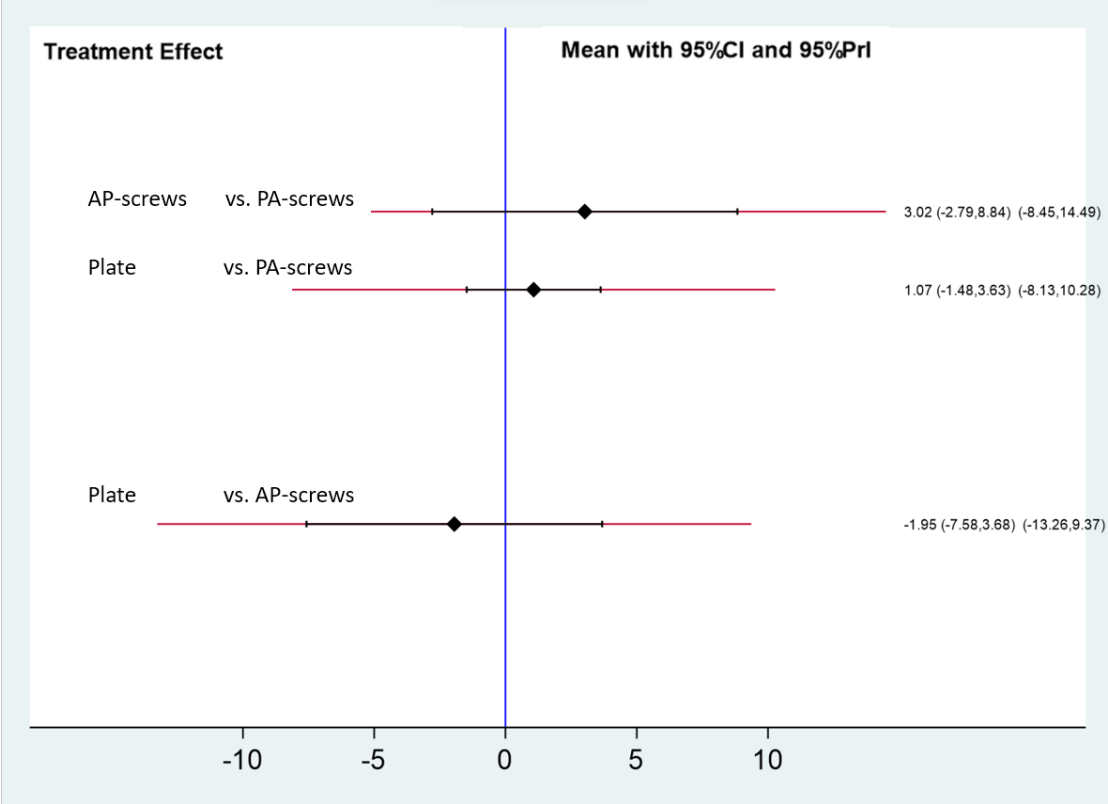


*Domain 1: Bias due to confounding; Domain 2: Bias in the selection of participants into the study; Domain 3: Bias in the classification of intervention; Domain 4: Bias due to deviations from the intended intervention; Domain 5: Bias due to missing data; Domain 6: Bias in the measurement of outcomes; Domain 7: Bias in the selection of the reported result.

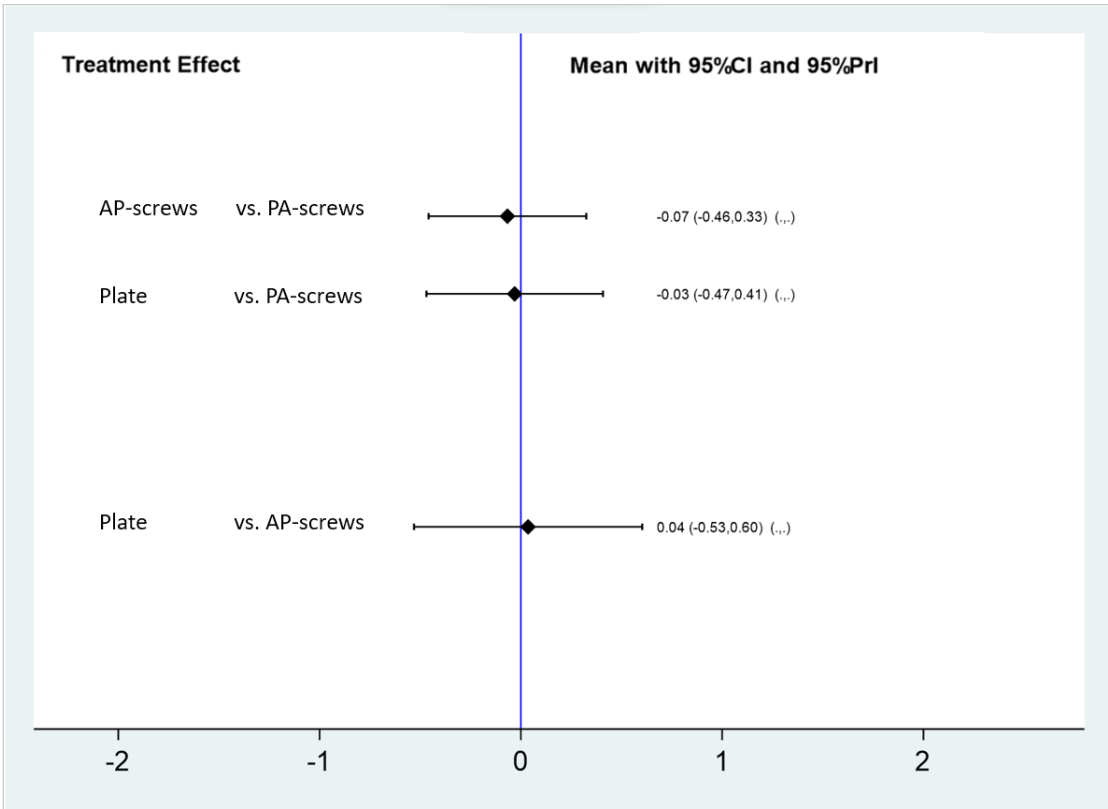
Fig a. Network forest plots

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; AOFAS changes, changes in the American Orthopedic Foot and Ankle Score; VAS changes, changes in visual analogue scale; CI, confidence interval; PrI, prediction interval.

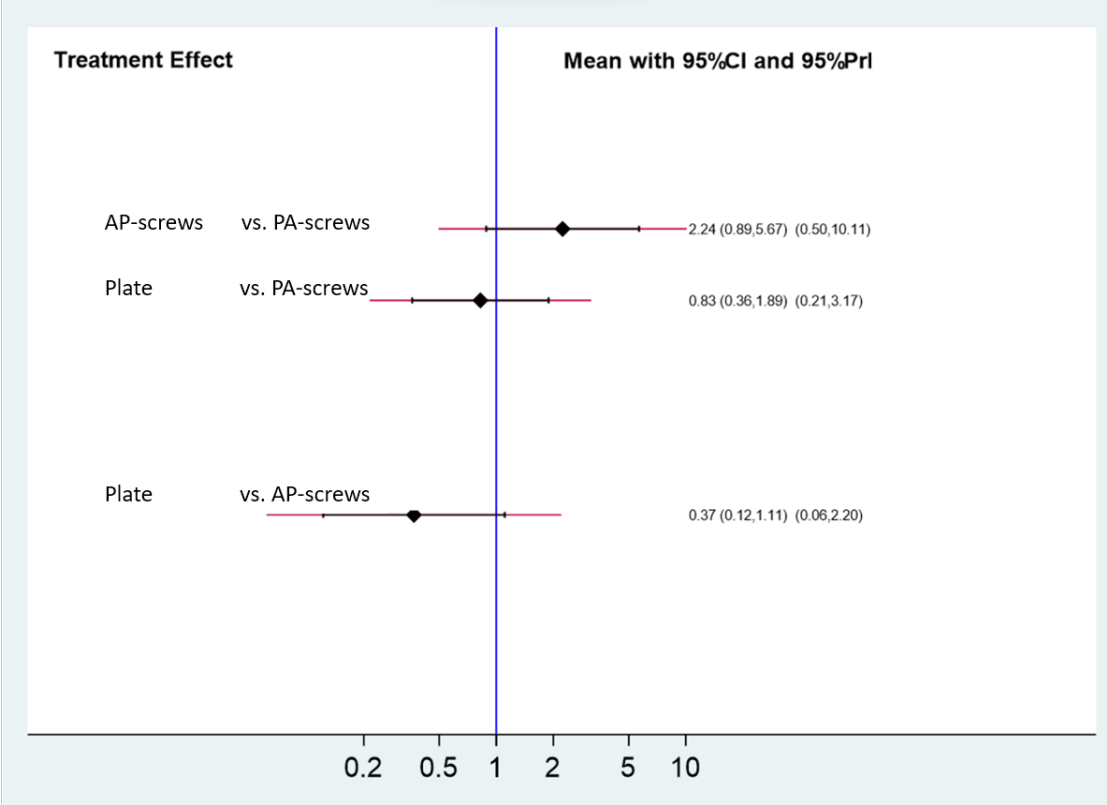
(A) AOFAS changes



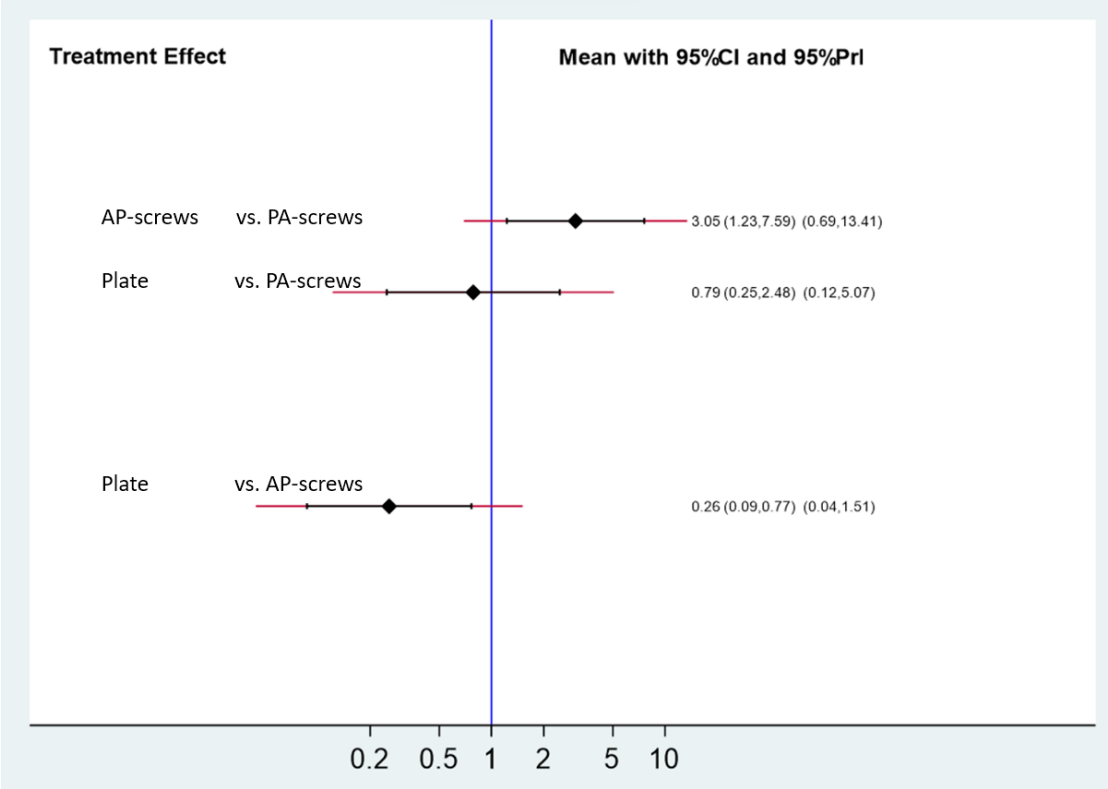
(B) VAS changes



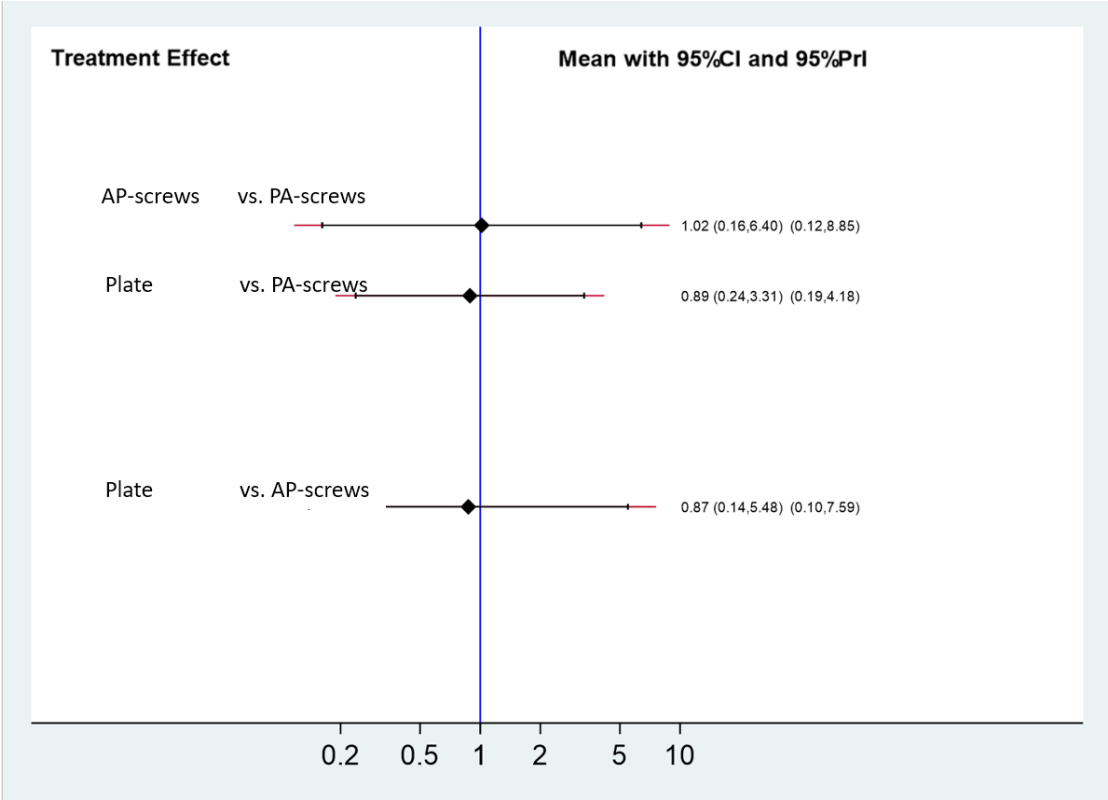
(C) The incidence of osteoarthritis grade progression



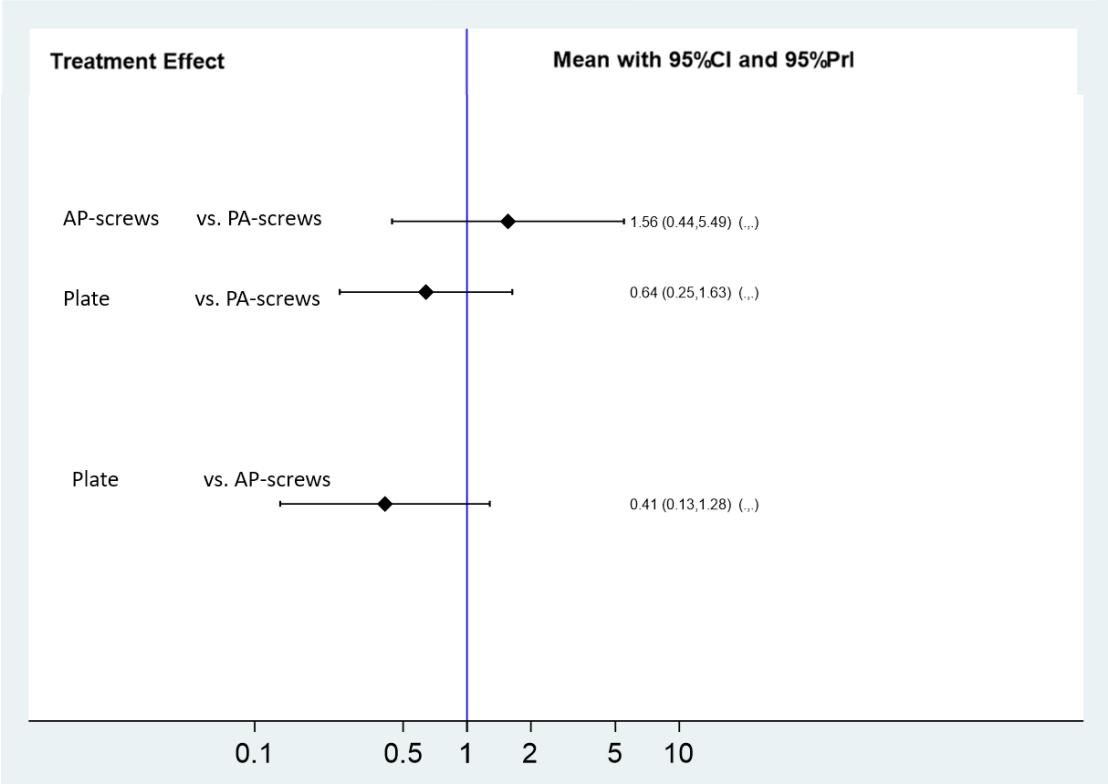
(D) The incidence of step-off ≥ 2mm



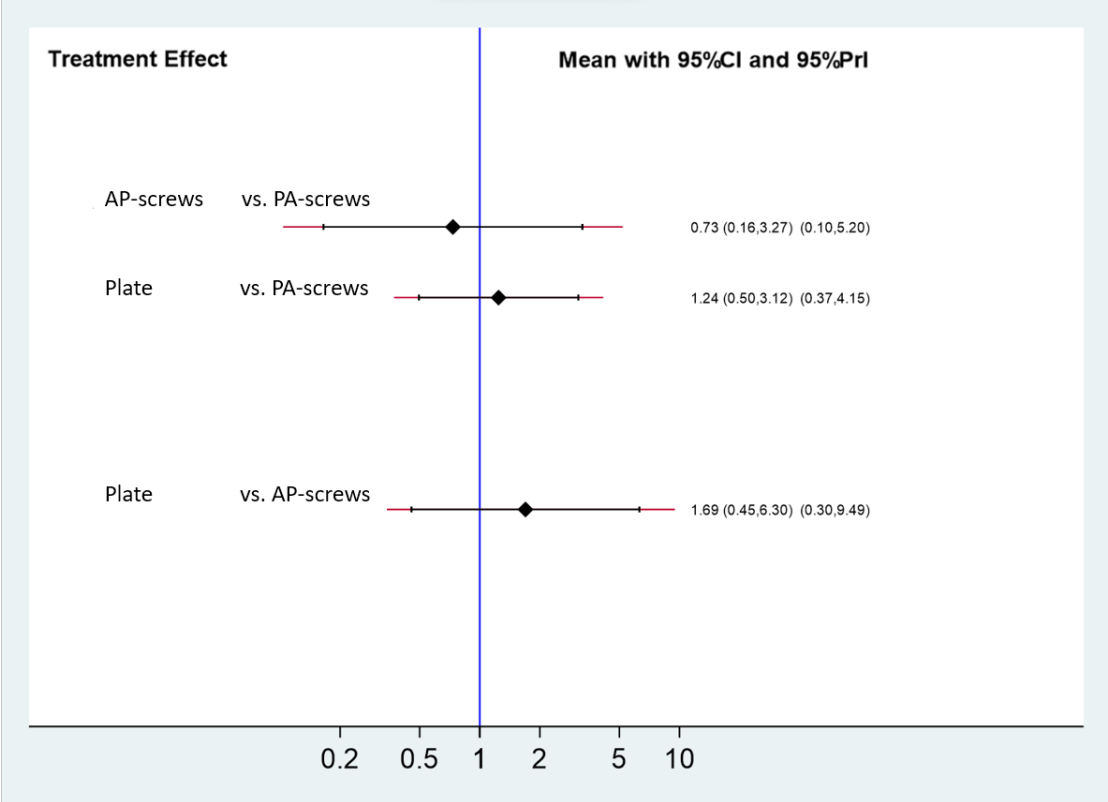
(E) The incidence of non-unions



(F) The incidence of loss of dorsiflexion ≥ 5 degrees



(G) The incidence of infections



(H) The incidence of peroneal nerve injuries

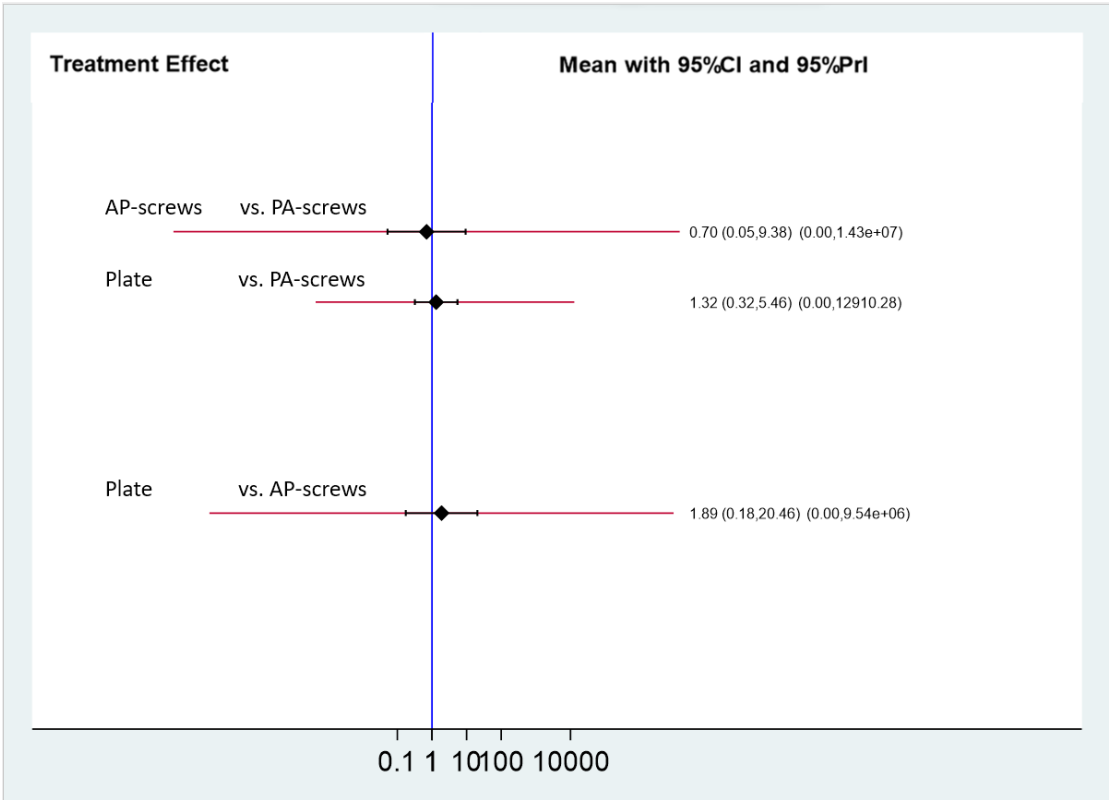
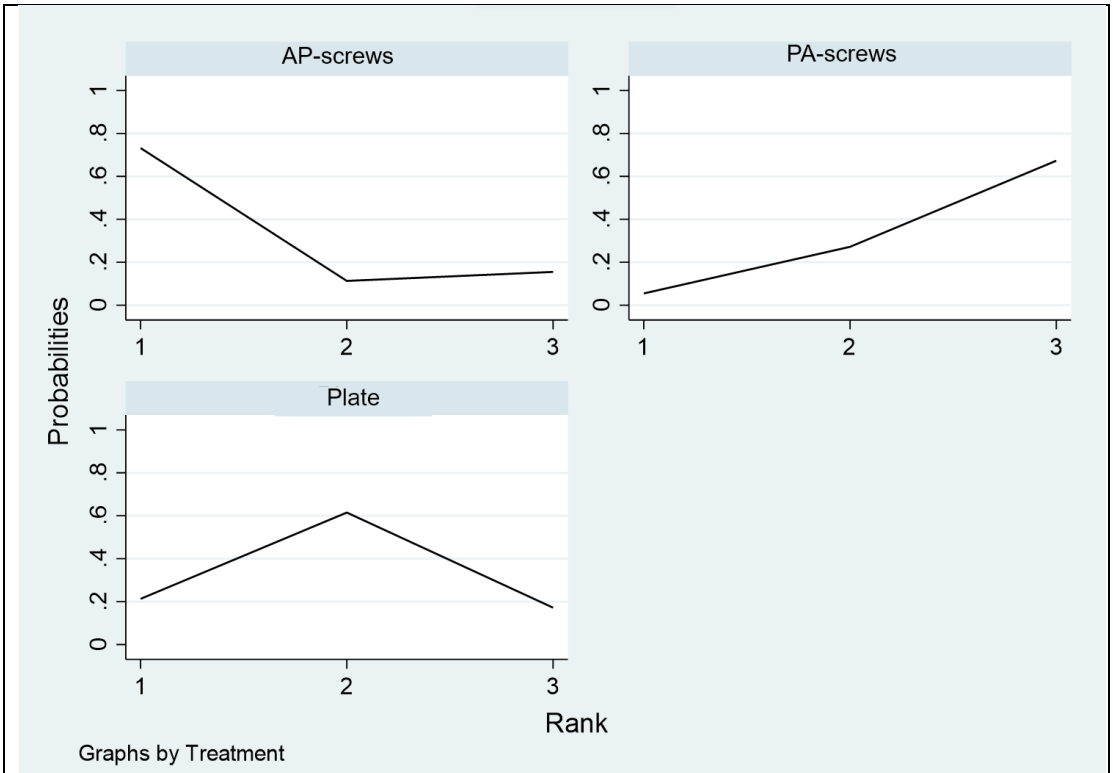


Fig b. Relative ranking probability

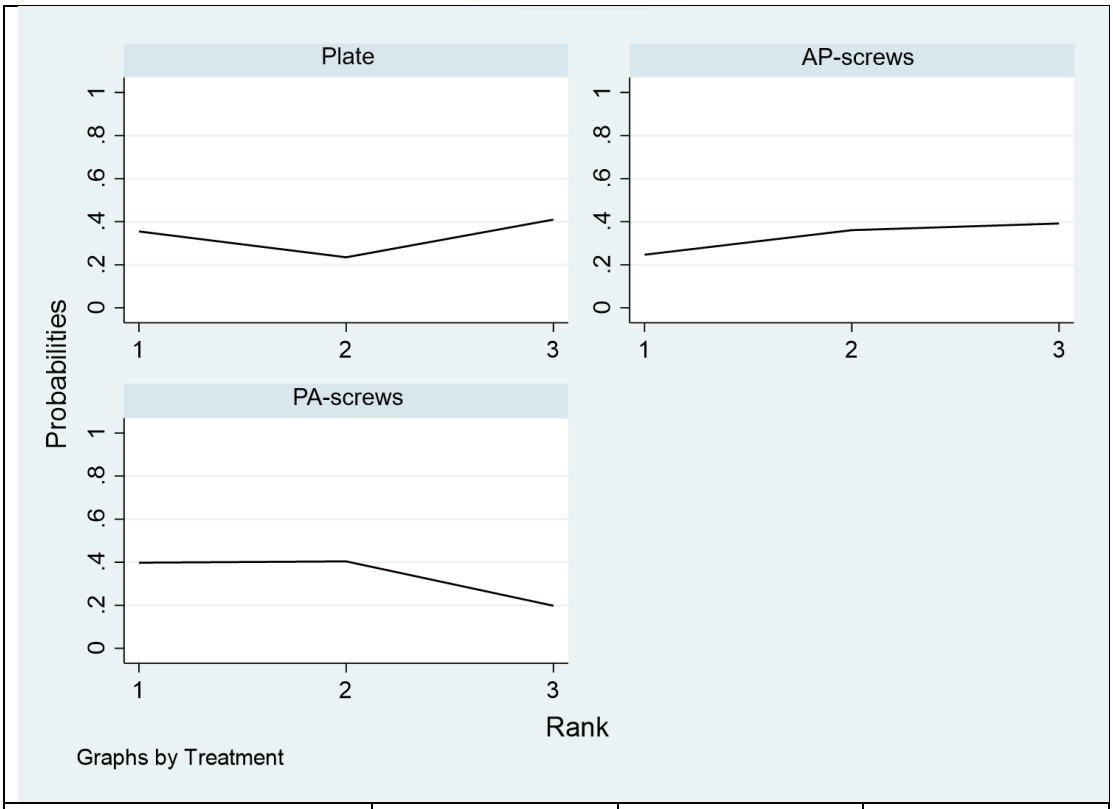
(A) AOFAS changes



Ranking/constructs	P-A screws	A-P screws	Plate
Best	5.5	73.2	21.3
2nd	27.2	11.3	61.5
Worst	67.3	15.5	17.2
Mean rank	2.6	1.4	2.0
SUCRA	19.1	78.8	52.2

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; AOFAS changes, changes in The American Orthopedic Foot and Ankle Score; SUCRA, the surface under the cumulative ranking curve

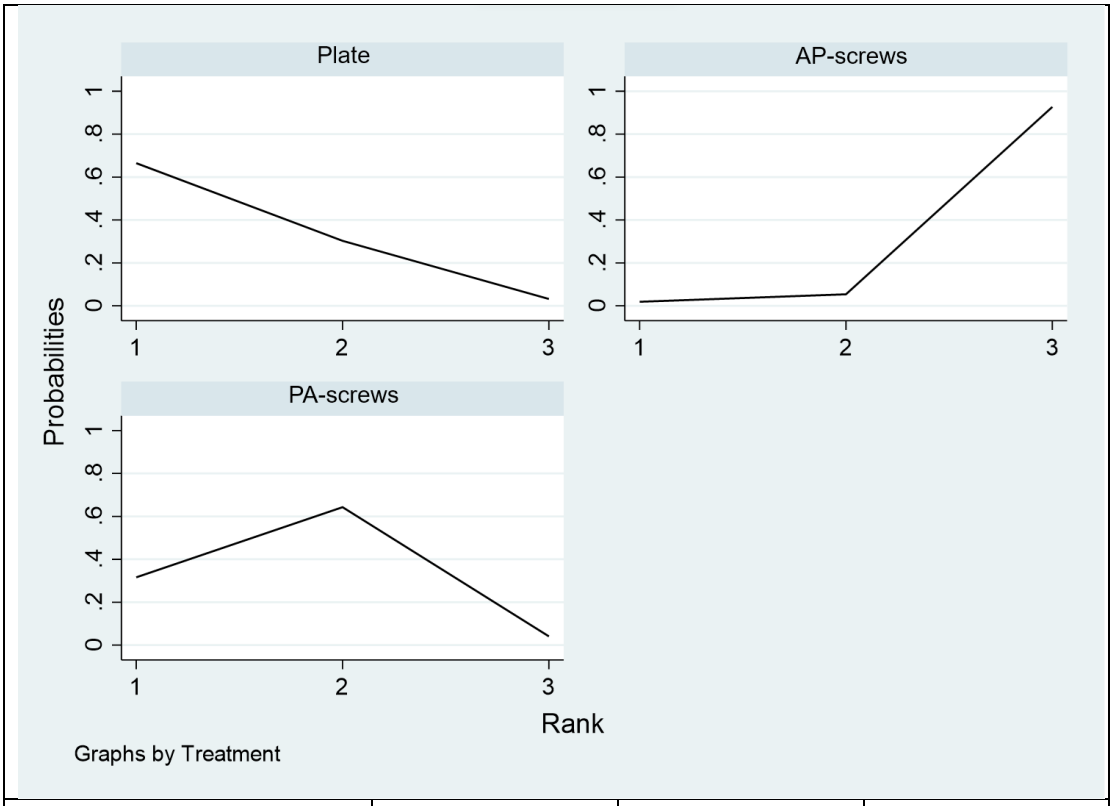
(B) VAS changes



Ranking/constructs	P-A screws	A-P screws	Plate
Best	36.3	26.4	37.3
2nd	46.3	29.7	24.0
Worst	17.4	43.9	38.7
Mean rank	1.8	2.2	2.0
SUCRA	59.4	41.3	49.3

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; VAS changes, changes in Visual Analogue Scale; SUCRA, the surface under the cumulative ranking curve

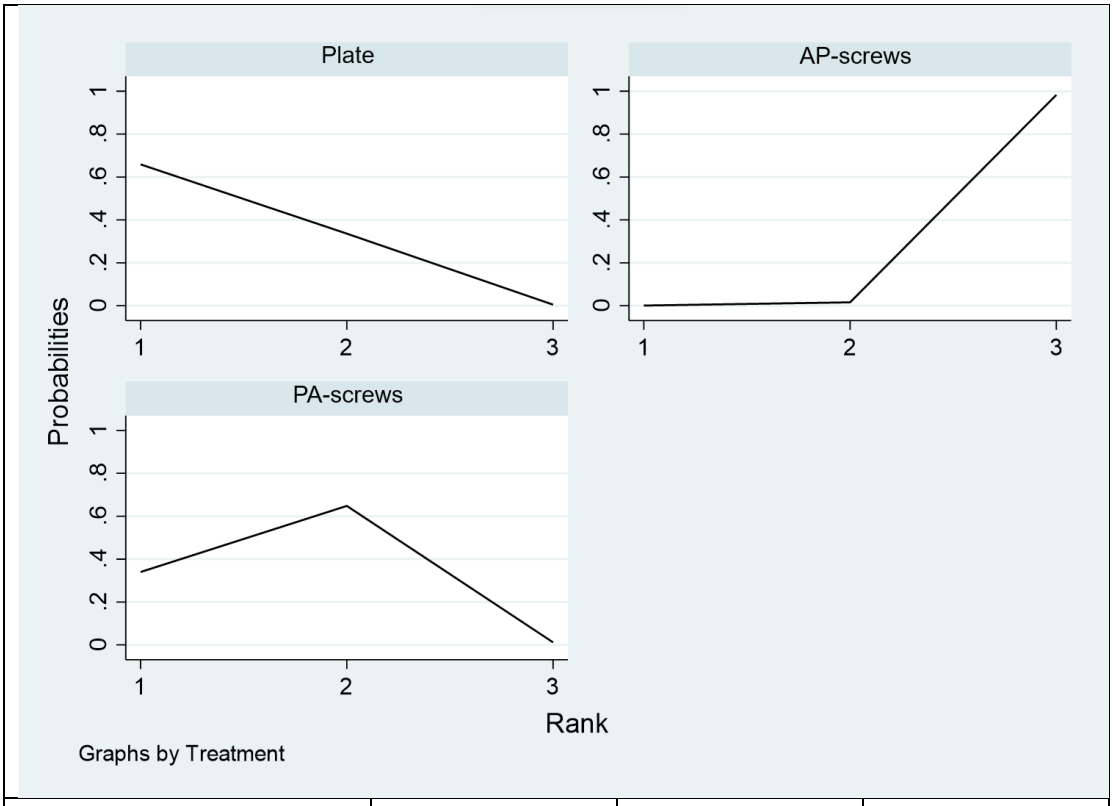
(C) The incidence of osteoarthritis grade progression



Ranking/constructs	P-A Screws	A-P Screws	Plate
Best	31.1	1.8	67.1
2nd	64.1	6.2	28.7
Worst	4.8	92.0	3.2
Mean rank	1.7	2.9	1.4
SUCRA	63.1	4.9	81.9

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

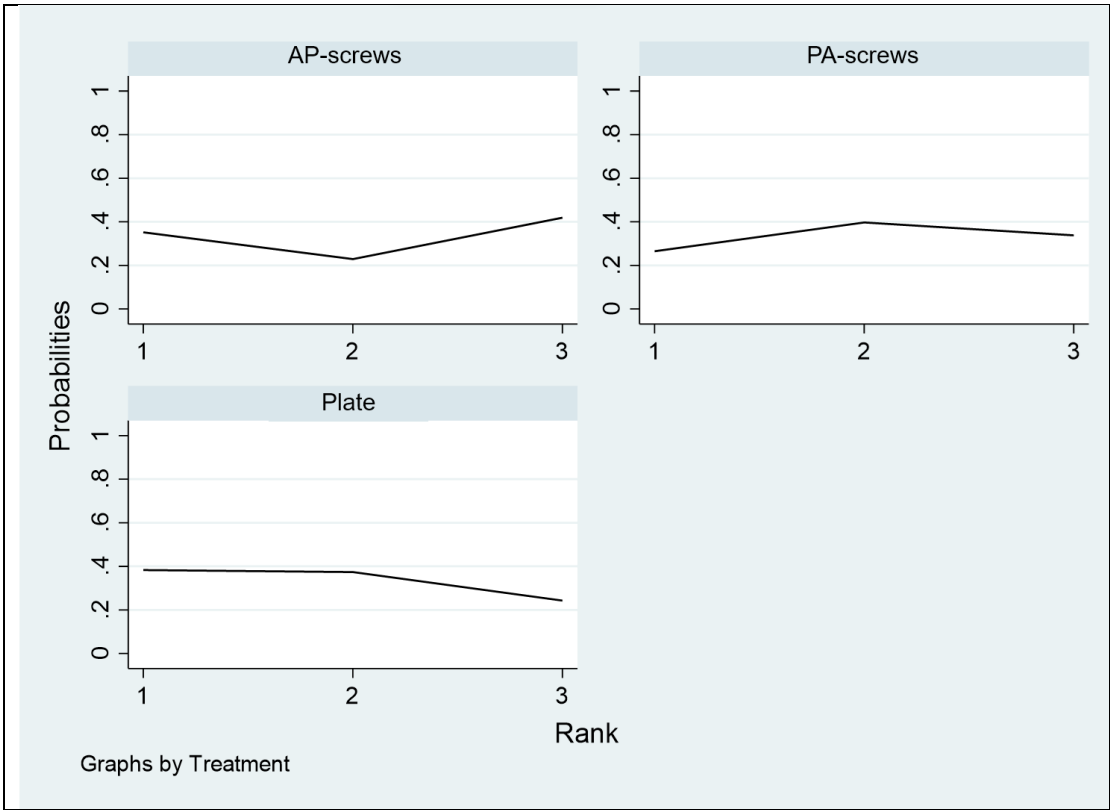
(D) The incidence of step-off ≥ 2mm



Ranking/constructs	P-A Screws	A-P Screws	Plate
Best	32.4	0.0	67.6
2nd	66.8	1.7	31.5
Worst	0.8	98.3	0.9
Mean rank	1.7	3.0	1.3
SUCRA	65.8	0.9	83.3

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

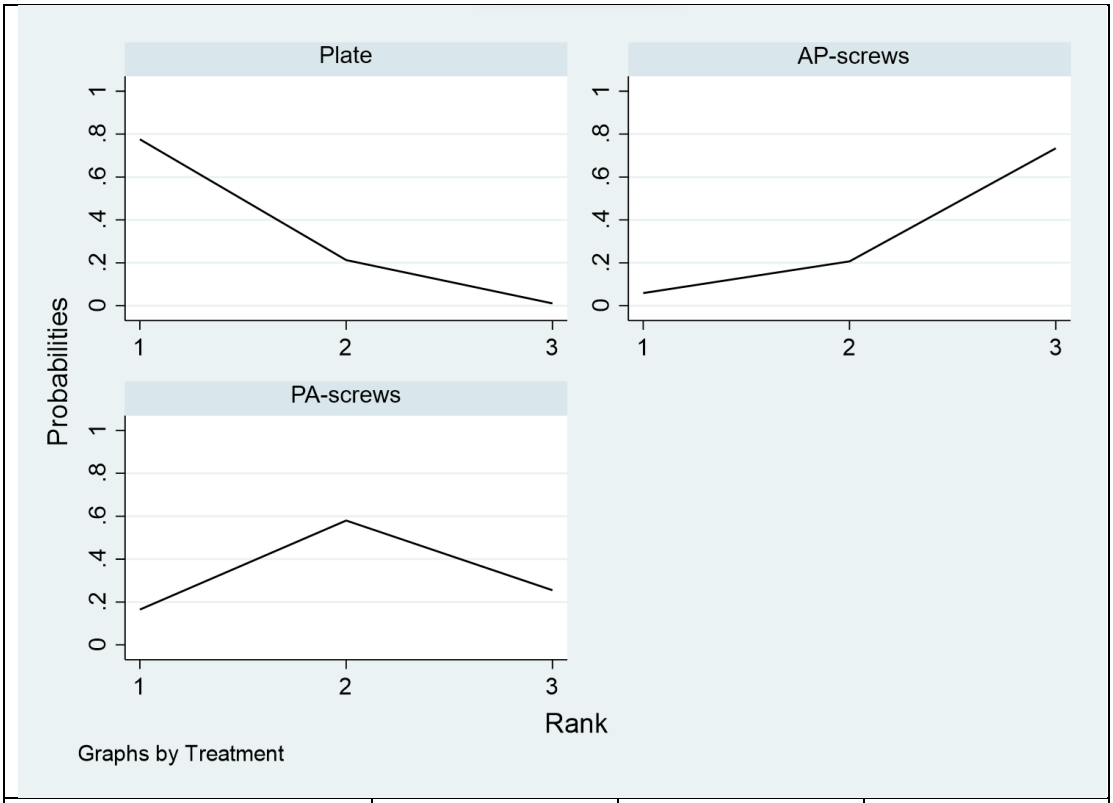
(E) The incidence of non-unions



Ranking/constructs	P-A screws	A-P Screws	Plate
Best	26.5	35.2	38.3
2nd	39.7	22.9	37.4
Worst	33.8	41.9	24.3
Mean rank	2.1	2.1	1.9
SUCRA	46.4	46.7	57.0

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

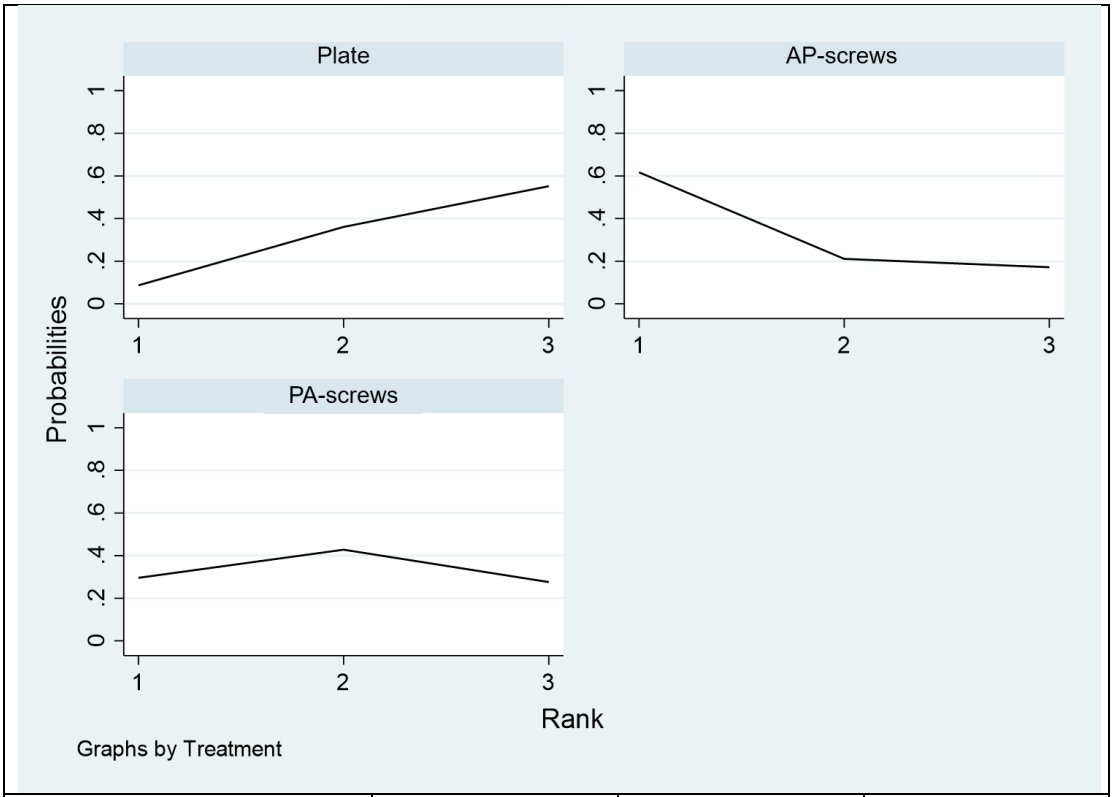
(F) The incidence of loss of dorsiflexion ≥ 5 degrees



Ranking/constructs	P-A screws	A-P Screws	Plate
Best	16.5	5.9	77.6
2nd	58.0	20.7	21.3
Worst	25.5	73.4	1.1
Mean rank	2.1	2.7	1.2
SUCRA	45.5	16.3	88.2

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

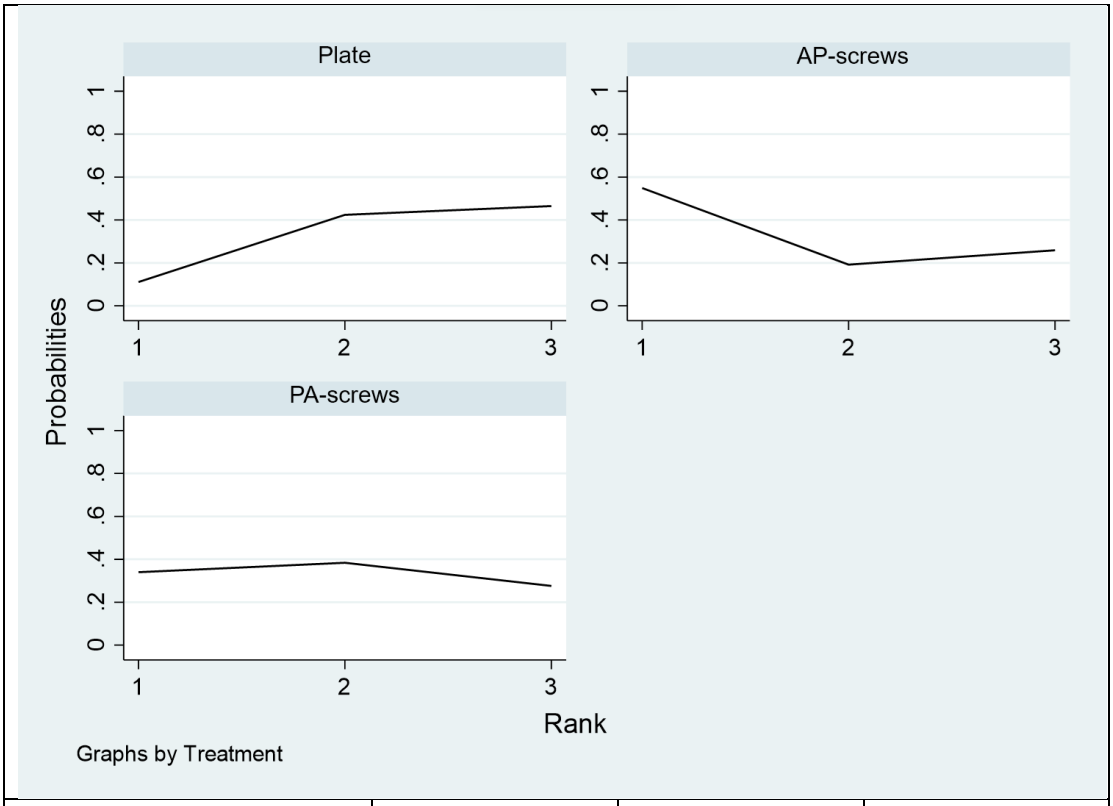
(G) The incidence of infections



Ranking/constructs	P-A screws	A-P Screws	Plate
Best	29.6	61.7	8.7
2nd	42.8	21.1	36.1
Worst	27.6	17.2	55.2
Mean rank	2.0	1.6	2.5
SUCRA	51.0	72.2	26.8

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

(H) The incidence of peroneal nerve injuries



Ranking/constructs	P-A screws	A-P Screws	Plate
Best	32.3	54.4	13.3
2nd	40.9	19.1	40.0
Worst	26.8	26.5	46.7
Mean rank	1.9	1.7	2.3
SUCRA	52.8	63.9	33.3

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

Table v. League tables

(A) Summary of pairwise and network meta-analyses of treatment effectiveness for AOFAS changes

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	6.81 (2.38, 11.23)	1.00 (-1.28, 3.27)
	3.02 (-2.79,8.84)	A-P Screws	-0.69 (-1.76, 3.14)
	1.07 (-1.48,3.63)	-1.95 (-7.58,3.68)	Plate

NOTE. Effect expressed as MD with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. A positive MD value indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; AOFAS changes, changes in The American Orthopedic Foot and Ankle Score.

(B) Summary of pairwise and network meta-analyses of treatment effectiveness for VAS score changes

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	0.00 (-0.29, 0.29)	-0.12 (-0.55, 0.31)
	-0.07 (-0.46,0.33)	A-P Screws	0.39 (-0.33, 1.11)
	-0.03 (-0.47,0.41)	0.04 (-0.53,0.60)	Plate

NOTE. Effect expressed as MD with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. A positive MD value indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; VAS changes, changes in Visual Analogue Scale.

(C) Summary of pairwise and network meta-analyses of treatment effectiveness for the incidence of osteoarthritis grade progression

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	2.20 (0.79, 6.12)	0.86 (0.36, 2.08)
	2.24 (0.89,5.67)	A-P Screws	0.33 (0.66, 1.92)
	0.83 (0.36,1.89)	0.37 (0.12,1.11)	Plate

NOTE. Effect expressed as OR with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. An OR value < 1 indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws.

(D) Summary of pairwise and network meta-analyses of treatment effectiveness for the incidence of step-off ≥ 2mm

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	4.21 (1.52, 11.63)	0.36 (0.08, 1.75)
	3.05 (1.23,7.59)	A-P Screws	0.45 (0.12, 1.72)
	0.79 (0.25,2.48)	0.26 (0.09,0.77)	Plate

NOTE. Effect expressed as OR with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. An OR value < 1 indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws.

(E) Summary of pairwise and network meta-analyses of treatment effectiveness for the incidence of non-unions

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	0.87 (0.09, 8.52)	0.86 (0.17, 4.32)
	1.02 (0.16,6.40)	A-P Screws	0.64 (0.04, 10.69)
	0.89 (0.24,3.31)	0.87 (0.14,5.48)	Plate

NOTE. Effect expressed as OR with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. An OR value < 1 indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(F) Summary of pairwise and network meta-analyses of treatment effectiveness for the incidence of loss of dorsiflexion ≥ 5 degrees

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	1.31 (0.32, 5.43)	0.64 (0.25, 1.63)
	1.56 (0.44,5.49)	A-P Screws	0.38 (0.11, 1.23)
	0.64 (0.25,1.63)	0.41 (0.13,1.28)	Plate

NOTE. Effect expressed as OR with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. An OR value < 1 indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(G) Summary of pairwise and network meta-analyses of treatment effectiveness for the incidence of infections

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	0.45 (0.04, 5.58)	1.33 (0.51, 3.43)
	0.73 (0.16,3.27)	A-P Screws	1.46 (0.35, 6.10)
	1.24 (0.50,3.12)	1.69 (0.45,6.30)	Plate

NOTE. Effect expressed as OR with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. An OR value < 1 indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(H) Summary of pairwise and network meta-analyses of treatment effectiveness for the incidence of peroneal nerve injuries

	Pairwise Meta-analysis		
Network Meta-analysis	P-A Screws	0.66 (0.01, 35.23)	1.26 (0.30, 5.29)
	0.70 (0.05,9.38)	A-P Screws	1.60 (0.13, 19.61)
	1.32 (0.32,5.46)	1.89 (0.18,20.46)	Plate

NOTE. Effect expressed as OR with 95% CI for network meta-analysis or pairwise meta-analysis. The results of the network meta-analyses are shown in the lower left diagonal, while the results of the pairwise meta-analyses are displayed in the upper right diagonal. An OR value < 1 indicates a favorable outcome for the intervention in the lower diagonal.

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

Table vi. Grading the evidence using CINeMA web application

(A) Grading the evidence in fixation constructs for the American Orthopedic Foot and Ankle Score change/improvement

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	2	Some concerns	Low risk	No concerns	No concerns	Some concerns	No concerns	Moderate
Plate:P-A screws	9	Some concerns	Low risk	No concerns	No concerns	Some concerns	No concerns	Moderate
A-P Screws:P-A screws	2	Some concerns	Low risk	No concerns	No concerns	Some concerns	No concerns	Moderate

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(B) Grading the evidence in fixation constructs for visual Analogue Scale change/improvement

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	1	Major concerns	Low risk	No concerns	No concerns	Major concerns	No concerns	Very low
Plate:P-A screws	2	Some concerns	Low risk	No concerns	No concerns	Major concerns	No concerns	Very low
A-P Screws:P-A screws	2	Some concerns	Low risk	No concerns	No concerns	Major concerns	No concerns	Very low

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(C) Grading the evidence in fixation constructs for the incidence of osteoarthritis grade progression

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	2	Some concerns	Low risk	No concerns	Some concerns	Some concerns	No concerns	Moderate
Plate:P-A screws	5	No concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low
A-P Screws:P-A screws	2	Some concerns	Low risk	No concerns	Some concerns	No concerns	No concerns	Moderate

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(D) Grading the evidence in fixation constructs for the incidence of step-off ≥ 2mm

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	2	Some concerns	Low risk	No concerns	No concerns	Major concerns	No concerns	**Low**
Plate:P-A screws	3	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	**Low**
A-P Screws:P-A screws	2	Some concerns	Low risk	No concerns	No concerns	Some concerns	No concerns	**Moderate**

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(E) Grading the evidence in fixation constructs for the incidence of non-unions

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	3	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low
Plate:P-A screws	8	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low
A-P Screws:P-A screws	3	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(F) Grading the evidence in fixation constructs for the incidence of loss of dorsiflexion ≥ 5 degrees

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	1	Major concerns	Low risk	No concerns	Some concerns	Some concerns	No concerns	Low
Plate:P-A screws	2	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low
A-P Screws:P-A screws	1	Major concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Very low

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

(G) Grading the evidence in fixation constructs for the incidence of infections

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	2	Major concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Very low
Plate:P-A screws	7	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low
A-P Screws:P-A screws	2	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low

*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

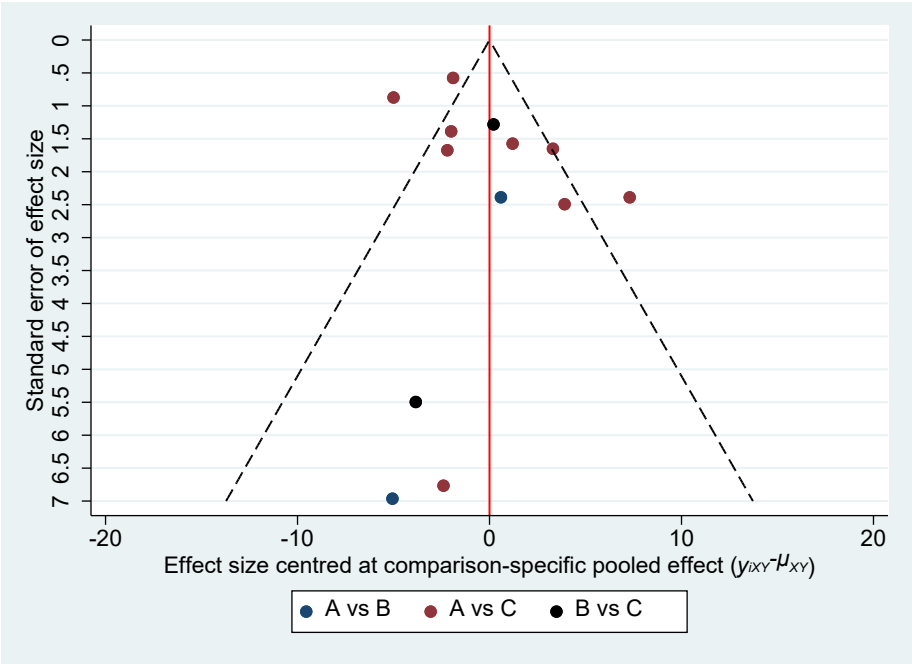
(H) Grading the evidence in fixation constructs for the incidence of peroneal nerve injuries

Comparison	Studies	Within-study bias	Reporting bias	Indirectness	Imprecision	Heterogeneity	Incoherence	Confidence rating
Plate:A-P screws	2	Major concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Very low
Plate:P-A screws	4	Some concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Low
A-P Screws:P-A screws	1	Major concerns	Low risk	No concerns	Major concerns	No concerns	No concerns	Very low

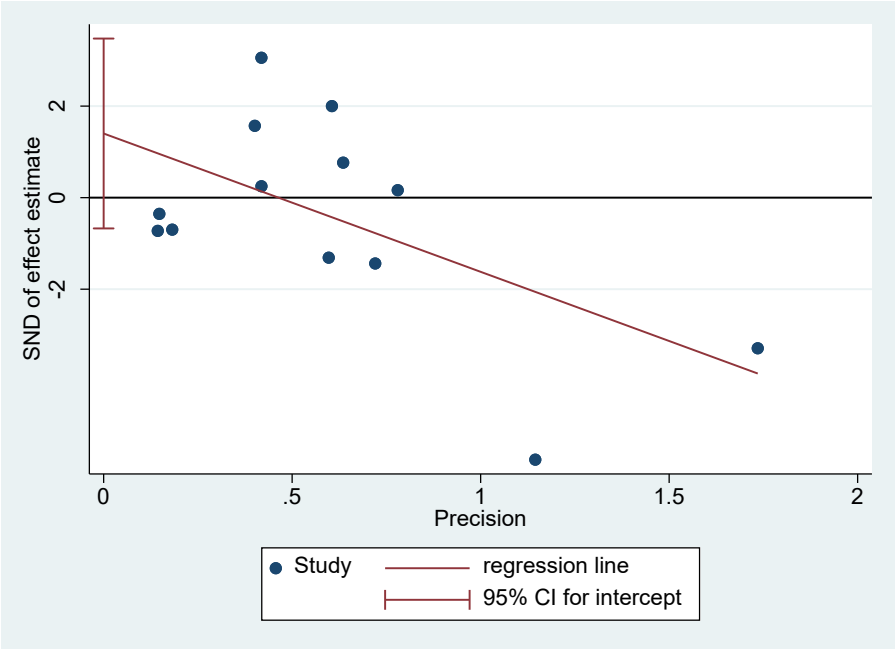
*Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws

Figure c. Publication bias

(A) Funnel plot and Egger's regression test for AOFAS changes

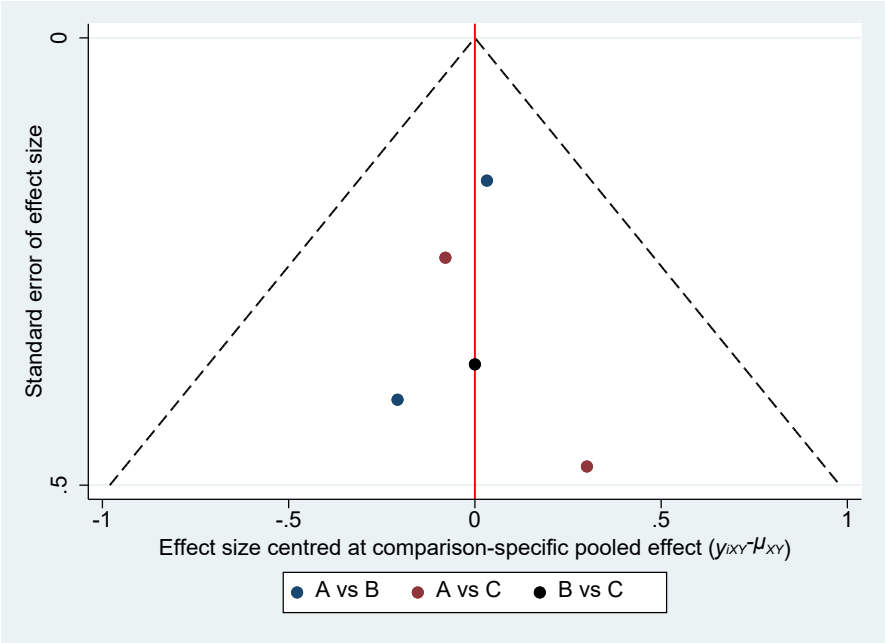


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate; American Orthopedic Foot and Ankle Score(final follow-up)

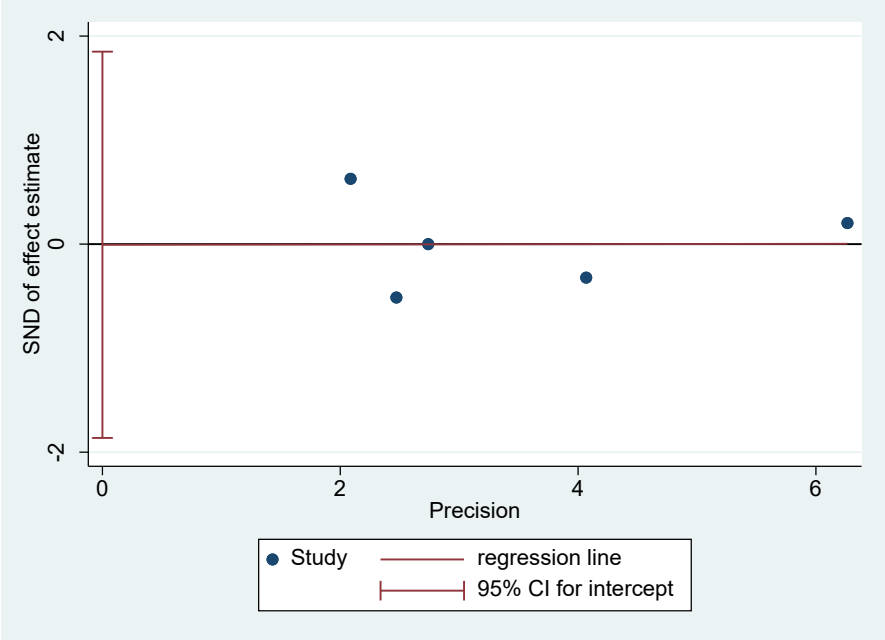


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	-3.022259	1.269577	-2.38	0.036	-5.816579	-.2279399
bias	1.401978	.9423804	1.49	0.165	-.672187	3.476144
Test of H0: no small-study effects *P* = 0.165						

(B) Funnel plot and Egger's regression test for VAS changes

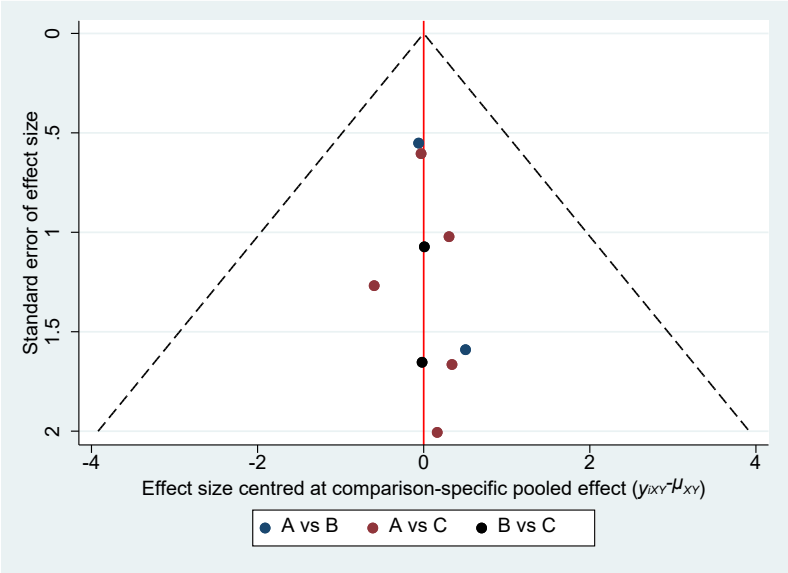


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate; Visual Analogue Scale score(final follow-up)

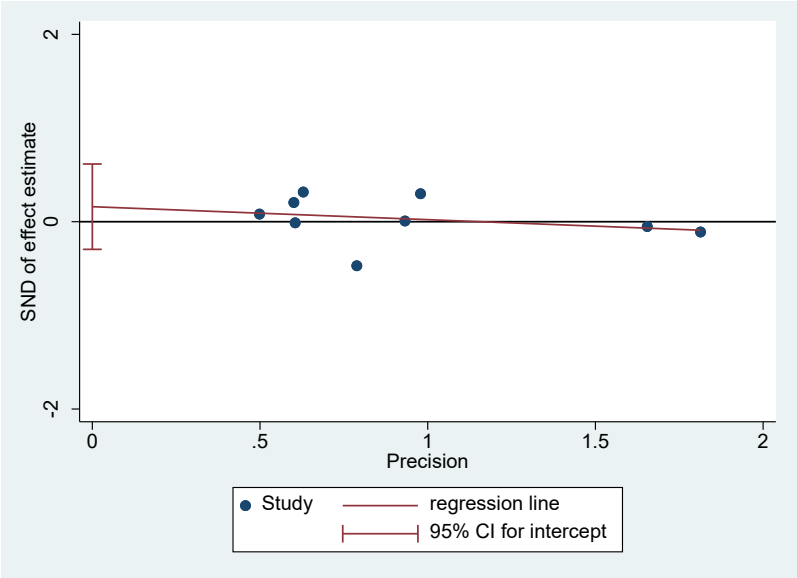


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	.0015353	.1518789	0.01	0.993	-.4818112	.4848817
bias	-0.006424	.5834252	-0.01	0.992	-1.863143	1.850295
Test of H0: no small-study effects *P* = 0.992						

(C) Funnel plot and Egger's regression test for the incidence of osteoarthritis grade progression

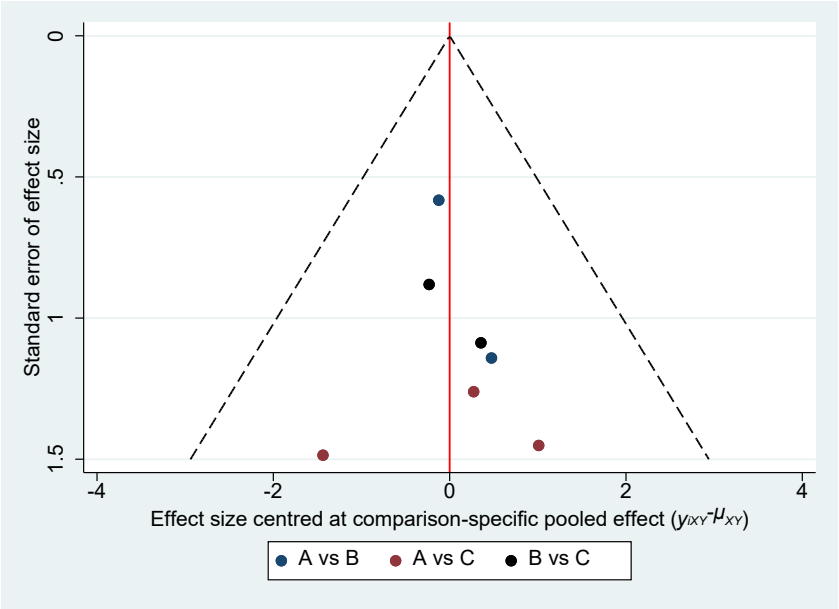


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

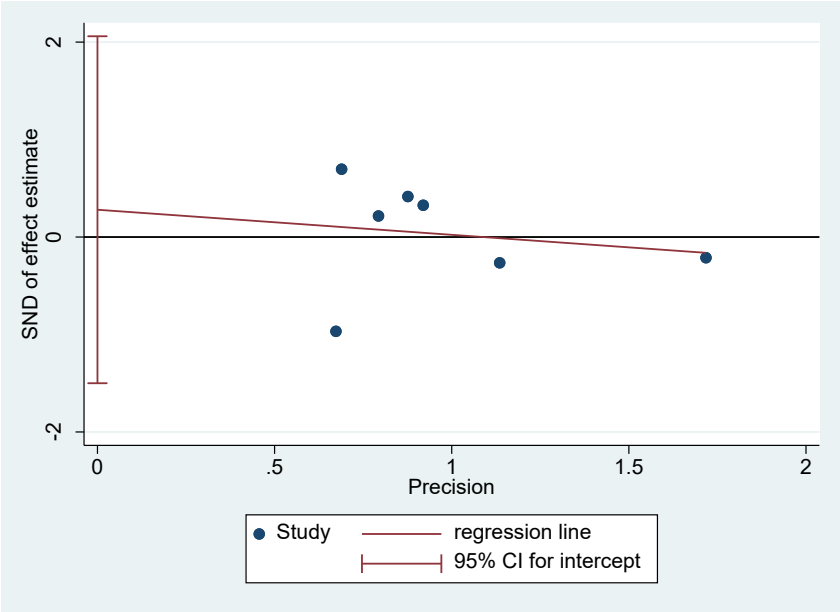


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	-.1384289	.1841923	-0.75	0.477	-.5739744	.2971165
bias	.160336	.1926532	0.83	0.433	-.2952165	.6158884
Test of H0: no small-study effects *P* = 0.433						

(D) Funnel plot and Egger's regression test for the incidence of step-off ≥ 2mm

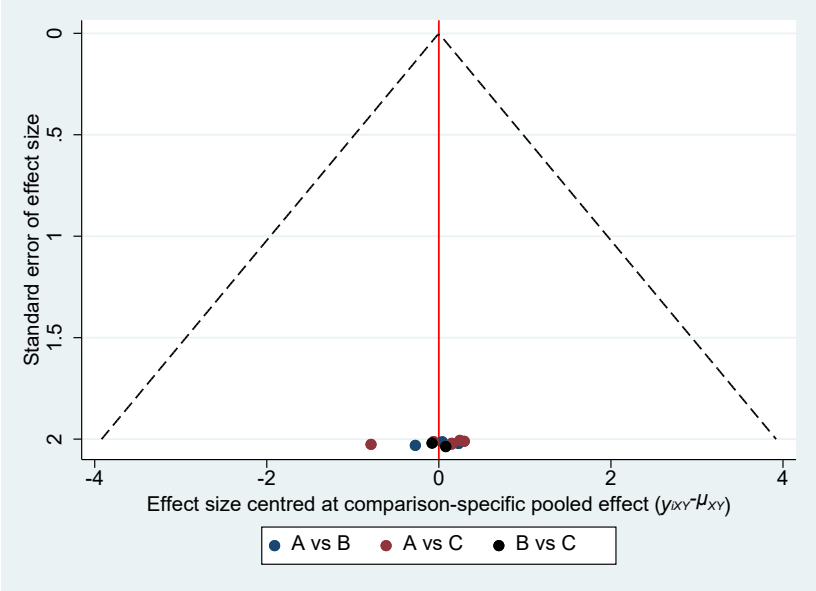


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

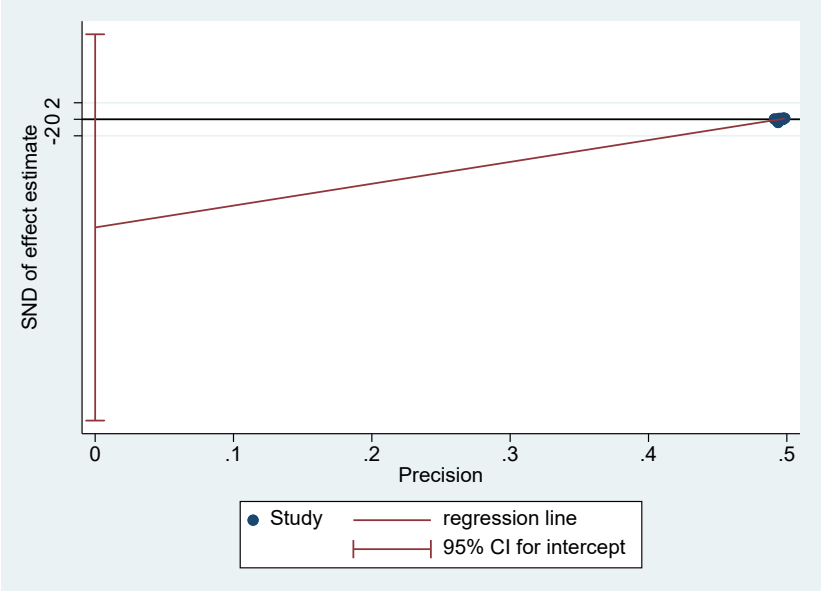


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	-.2572949	.67302	-0.38	0.718	-1.987348	1.472758
bias	.2802092	.6924838	0.40	0.702	-1.499877	2.060295
Test of H0: no small-study effects *P* = 0.702						

(E)Funnel plot and Egger's regression test for the incidence of non-unions

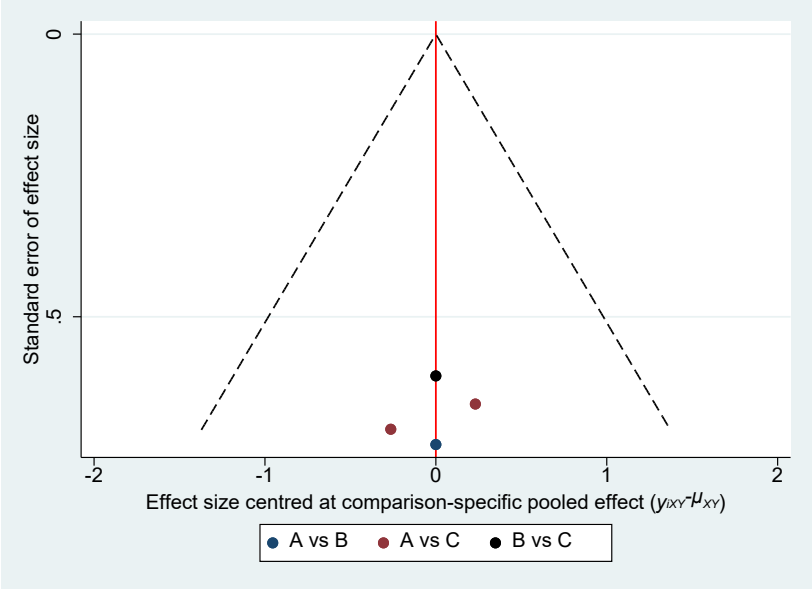


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

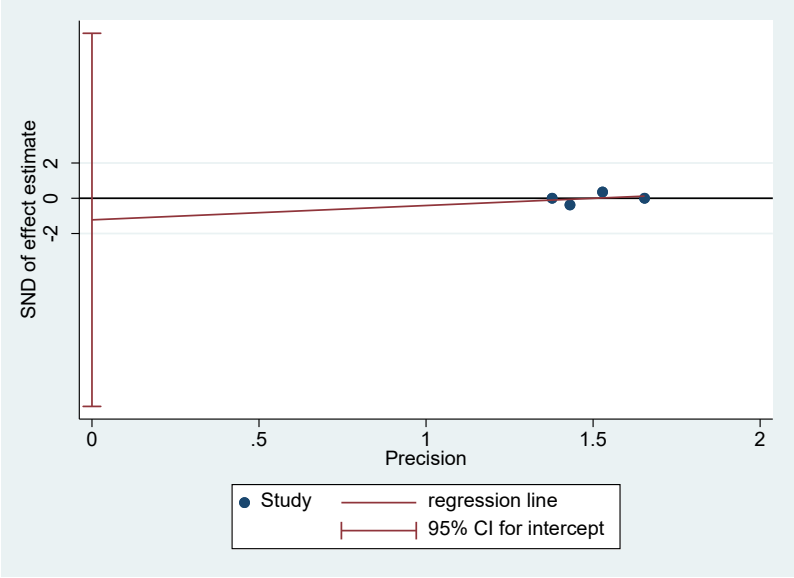


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	26.45574	20.88847	1.27	0.237	-20.79727	73.70875
bias	-13.09814	10.34171	-1.27	0.237	-36.4927	10.29643
Test of H0: no small-study effects *P* = 0.237						

(F) Funnel plot and Egger's regression test for the incidence of loss of dorsiflexion ≥ 5 degrees

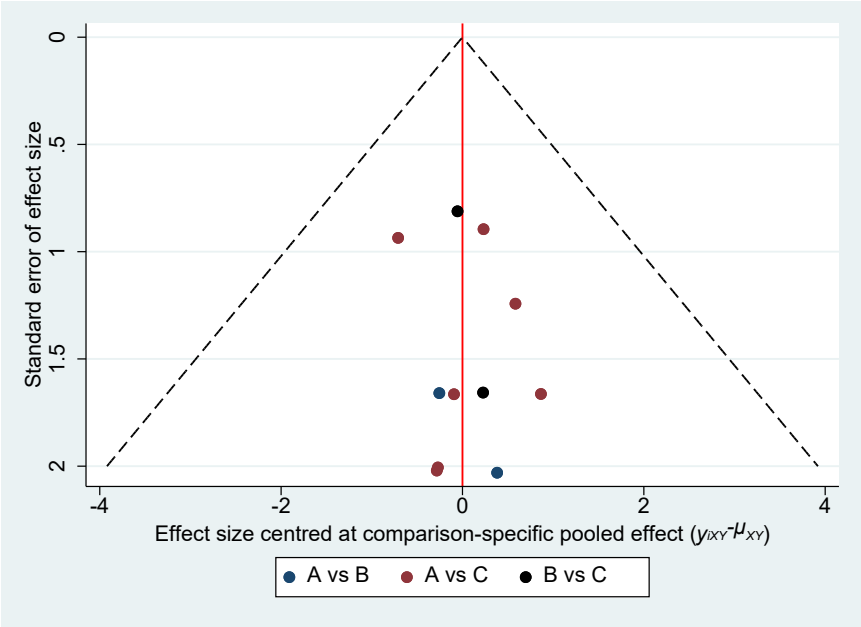


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

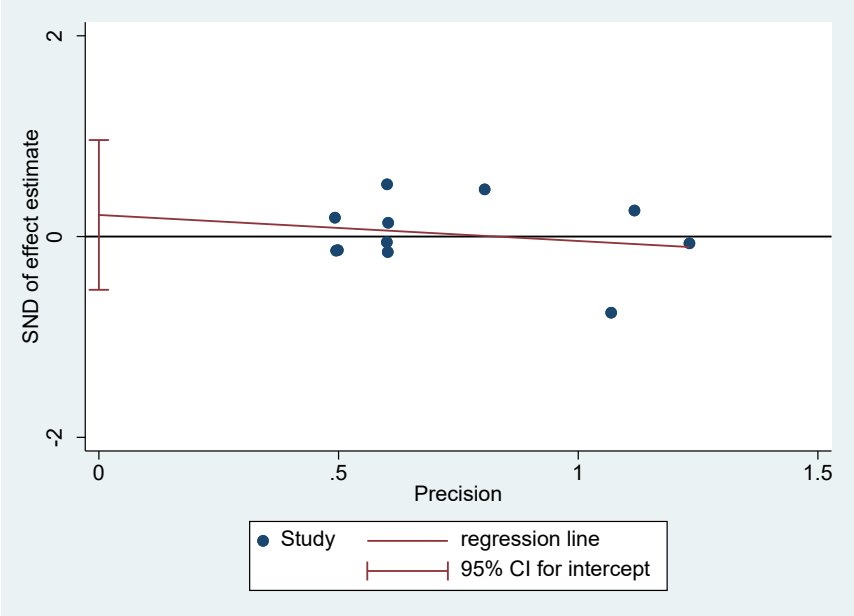


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	.813796	1.638069	0.50	0.669	-6.234245	7.861837
bias	-1.224837	2.459375	-0.50	0.668	-11.80667	-9.356998
Test of H0: no small-study effects *P* = 0.668						

(G)Funnel plot and Egger's regression test for the incidence of infections

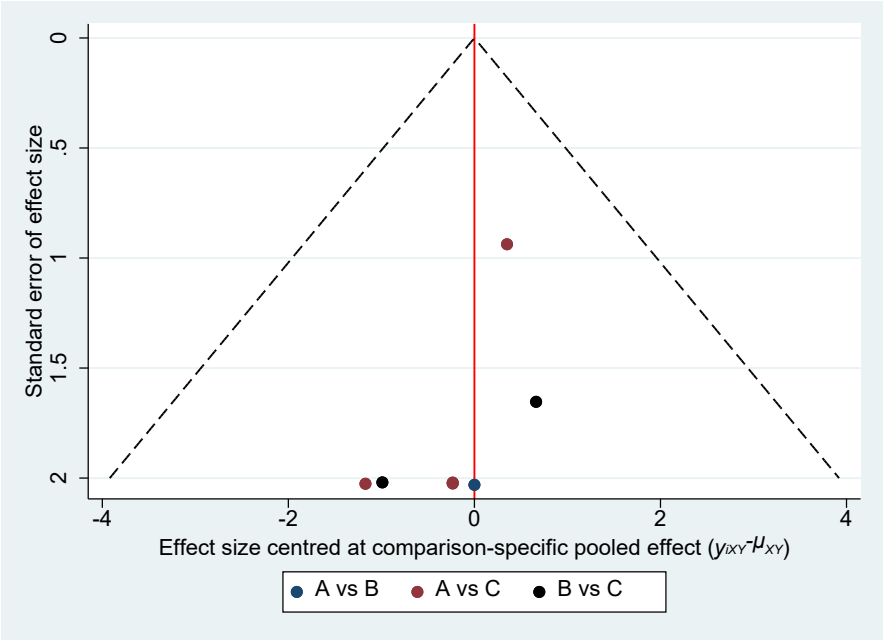


*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

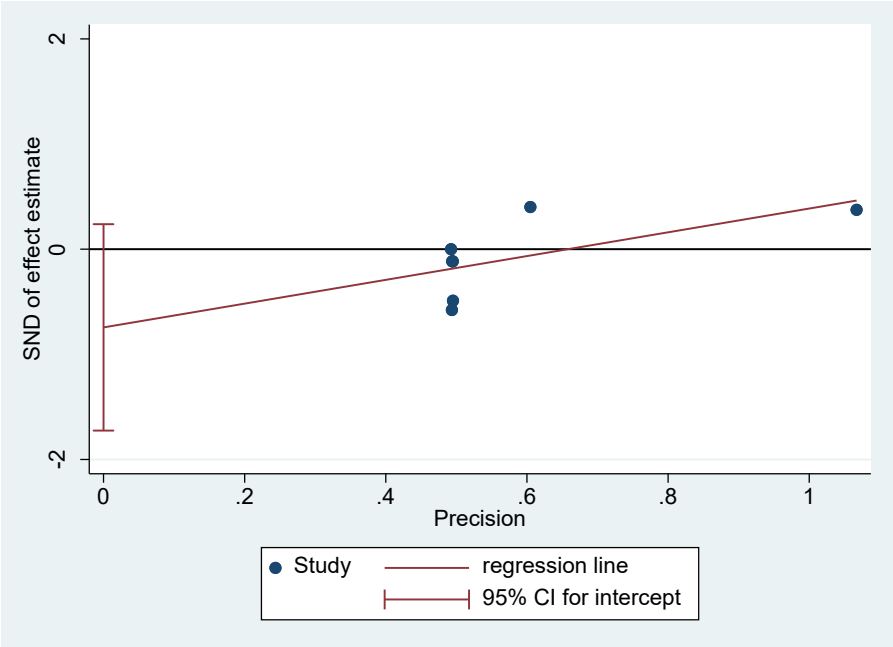


Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	-.2592954	.4211579	-0.62	0.553	-1.212021	.6934299
bias	.2153737	.3297208	0.65	0.530	-.5305066	.961254
Test of H0: no small-study effects *P* = 0.530						

(H) Funnel plot and Egger's regression test for the incidence of peroneal nerve injuries



*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate



Egger's test for small-study effects:						
Std_Eff	Coefficient	Std. err.	t	*P*>|t|	[95% conf.	interval]
slope	1.130469	.6119427	1.85	0.124	-.4425794	2.703518
bias	-.7437146	.3818208	-1.95	0.109	-1.725216	.2377871
Test of H0: no small-study effects *P* = 0.109						

Table vii. Meta-regression

(A) SUCRA and mean ranks changes of AOFAS changes before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	25.8	78.6	45.5
Age	41.5	85.7	22.8
Male ratio	44.8	72.2	32.9
Publish year	28.7	71.3	42.8
Publish type	21.1	69.3	59.6

Covariate/ Mean rank	P-A Screw	A-P Screw	Plate
Unadjusted model	2.5	1.4	2.1
Age	2.2	1.3	2.5
Male ratio	2.1	1.6	2.3
Publish year	2.4	1.4	2.1
Publish type	2.6	1.6	1.8

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; AOFAS changes, changes in The American Orthopedic Foot and Ankle Score; SUCRA, the surface under the cumulative ranking curve

(B) SUCRA and mean ranks changes of VAS changes before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	59.4	41.3	49.3
Age	78.2	16.8	55.0
Male ratio	50.8	22.4	76.8
Publish year	N/A*	N/A*	N/A*
Publish type	33.0	33.0	83.9

Covariate/ Mean rank	P-A Screws	A-P Screws	Plate
Unadjusted model	1.8	2.2	2.0
Age	1.4	2.7	1.9
Male ratio	2.0	2.6	1.5
Publish year	N/A*	N/A*	N/A*
Publish type	2.3	2.3	1.3

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws;VAS changes, changes in Visual Analogue Scale; SUCRA, the surface under the cumulative ranking curve

*Unavailability of subgroup data for meta-regression

(C) SUCRA and mean ranks changes of the incidence of osteoarthritis grade progression before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	63.1	4.9	81.9
Age	35.9	89.6	24.4
Male ratio	36.9	84.6	28.4
Publish year	54.2	66.9	28.9
Publish type	37.9	93.1	19.0

Covariate/ Mean rank	P-A Screws	A-P Screws	Plate
Unadjusted model	1.7	2.9	1.4
Age	2.3	1.2	2.5
Male ratio	2.3	1.3	2.4
Publish year	1.9	1.7	2.4
Publish type	2.2	1.1	2.6

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

(D) SUCRA and mean ranks changes of the incidence of step-off ≥ 2mm before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	65.8	0.9	83.3
Age	29.0	98.4	22.5
Male ratio	78.5	47.1	24.4
Publish year	40.6	90.8	18.5
Publish type	36.4	94.5	19.1

Covariate/ Mean rank	P-A Screws	A-P Screws	Plate
Unadjusted model	1.7	3	1.3
Age	2.4	1.0	2.5
Male ratio	1.4	2.1	2.5
Publish year	2.2	1.2	2.6
Publish type	2.3	1.1	2.6

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

(E) SUCRA and mean ranks changes of the incidence of non-unions before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	45.9	46.7	57.4
Age	49.0	56.5	44.6
Male ratio	52.3	53.8	43.9
Publish year	48.6	54.6	47.1
Publish type	51.0	52.7	46.3

Covariate/ Mean rank	P-A Screws	A-P Screws	Plate
Unadjusted model	2.1	2.1	1.9
Age	2.0	1.9	2.1
Male ratio	2.0	1.9	2.1
Publish year	2.0	1.9	2.1
Publish type	2.0	1.9	2.1

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

(F) SUCRA and mean ranks changes of the incidence of loss of dorsiflexion ≥ 5 degrees before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	45.5	16.3	88.2
Age	48.5	66.2	35.3
Male ratio	N/A*	N/A*	N/A*
Publish year	N/A*	N/A*	N/A*
Publish type	48.5	66.2	35.3

Covariate/ Mean rank	P-A Screws	A-P Screws	Plate
Unadjusted model	2.1	2.7	1.2
Age	2.0	1.7	2.3
Male ratio	N/A*	N/A*	N/A*
Publish year	N/A*	N/A*	N/A*
Publish type	2.0	1.7	2.3

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

*Unavailability of subgroup data for meta-regression

(G) SUCRA and mean ranks changes of the incidence of infections before and after model adjustment

Covariate/ SUCRA	P-A Screw	A-P Screw	Plate
Unadjusted model	60.3	68.4	21.3
Age	40.9	35.2	73.9
Male ratio	36.5	40.7	72.8
Publish year	51.2	32.4	66.4
Publish type	48.2	22.1	79.6

Covariate/ Mean rank	P-A Screw	A-P Screw	Plate
Unadjusted model	1.8	1.6	2.6
Age	2.2	2.3	1.5
Male ratio	2.3	2.2	1.5
Publish year	2.0	2.4	1.7
Publish type	2.0	2.6	1.4

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

(H) SUCRA and mean ranks changes of the incidence of peroneal nerve injuries before and after model adjustment

Covariate/ SUCRA	P-A Screws	A-P Screws	Plate
Unadjusted model	52.8	63.9	33.3
Age	45.7	31.0	73.3
Male ratio	40.4	51.3	58.2
Publish year	59.3	28.9	61.8
Publish type	53.3	42.7	54.0

Covariate/ Mean rank	P-A Screws	A-P Screws	Plate
Unadjusted model	1.9	1.7	2.3
Age	2.1	2.4	1.5
Male ratio	2.2	2.0	1.8
Publish year	1.8	2.4	1.8
Publish type	1.9	2.1	1.9

Abbreviations: P-A screws, posteroanterior (P-A) screws; A-P screws, anteroposterior (A-P) screws; SUCRA, the surface under the cumulative ranking curve

Table viii. Inconsistency

In this study, both local and global inconsistencies within our network analysis framework were evaluated [1,2]. For local inconsistency, two distinct methods were implemented: the loop-specific method, which scrutinizes discrepancies between direct and indirect evidence, and the node-splitting approach, disaggregating evidence pertaining to a particular comparison into direct and indirect forms, enabling a detailed assessment of their variances. Additionally, we conducted a design-by-treatment analysis, a strategy aimed at appraising global inconsistency in the network.

References:

1. Lu G, Ades AE. Combination of direct and indirect evidence in mixed treatment comparisons. Stat Med. 2004;23(20):3105–3124.

2. White IR. Multivariate random-effects meta-regression: updates to Mvmeta. The Stata Journal. 2011;11(2):255–270.

(A) Overview of global design inconsistency and local loop inconsistency

Outcome	Fit design-by-treatment interaction model	Explore loop inconsistency
AOFAS changes	*P*=0.0806	*P*=0.4089
VAS changes	*P*=0.8121	*P*=0.8912
The incidence of osteoarthritis grade progression	*P*=0.9892	*P*=0.9321
The incidence of step-off ≥ 2mm	*P*=0.1600	*P*=0.1600
The incidence of non-unions	*P*=0.9792	*P=0.*9254
The incidence of loss of dorsiflexion ≥ 5 degrees	*P*=0.6678	*P*=0.3517
The incidence of infections	*P*=0.9622	*P*=0.6603
The incidence of peroneal nerve injuries	*P*=0.7489	*P*=0.6596

Symbols for abbreviation: AOFAS changes, changes in The American Orthopedic Foot and Ankle Score; VAS changes, changes in Visual Analogue Scale

(B) AOFAS changes: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
A B *	6.583443	2.251179	-9.784472	2.968006	16.36791	4.568124	0.000
A C *	.	.	.	.	.	.	.
B C	.6786113	1.248323	-15.6893	4.397447	16.36791	4.568124	0.000

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate; AOFAS changes, changes in The American Orthopedic Foot and Ankle Score

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -22.985 Number of observations = 9

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B						
_cons	6.300269	3.263543	1.93	0.054	-.0961583	12.6967
_y_C						
des_AC	-6.137529	3.513181	-1.75	0.081	-13.02324	.74818
_cons	6.378723	3.278746	1.95	0.052	-.0475015	12.80495

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant 6.30 represents the average mean difference between treatments A (P-A screws) and B in the AB design.

For_y_C, the constant 6.38 denotes the average mean difference between treatments A (P-A screws) and C in the AC design.

(C) VAS changes: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
A B *	-.002333	.1484688	-1.092326	.8686015	1.089993	.8958126	0.224
A C *	-.1208315	.2186997	.6998662	.6802681	-.8206976	.7233747	0.257
B C	.3775063	.356806	-.2233813	.2902408	.6008876	.4531157	0.185

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate; VAS changes, changes in Visual Analogue Scale

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -1.0845516 Number of observations = 3

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B _cons	-.0667333	.1999043	-0.33	0.739	-.4585385	.325072
_y_C _cons	-0.0306035	.2236868	-0.14	0.891	-.4690216	.4078147

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant -0.67 represents the average mean difference between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant -0.03 denotes the average mean difference between treatments A (P-A screws) and C in the AC design.

(D) Incidence of osteoarthritis grade progression: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
A B*	.7885385	.517013	.9290872	1.44603	-.1405487	1.573995	0.929
A C*	-.1564702	.4489139	-.5302033	1.480902	.3737331	1.569951	.812
B C	-1.128656	.8982209	-.9156778	.7227519	.2129781	1.154161	.854

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -12.840438 Number of observations = 7

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B _cons	.7971654	.487554	1.64	0.102	-.158421	1.752752
_y_C groupB	-.1498756	1.758159	-0.09	0.932	-3.595803	3.296052
_cons	-.1849159	.4317511	-0.43	0.688	-1.031133	.6613007

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant 0.80 represents the average difference of log odds ratio between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant -0.18 denotes the average difference of log odds ratio between treatments A (P-A screws) and C in the AC design.

(E) Incidence of step-off ≥ 2mm: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
A B	1.437214	.5185889	-.2131576	1.05369	1.650371	1.174392	0.160
A C	-1.010065	.801261	.64032	.8586722	-.1650385	1.174452	0.160
B C	-.7967799	.6844218	-2.447289	.9544347	1.650509	1.174468	0.160

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

3. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -17.328236 Number of observations = 7

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B						
_cons	1.437149	.5185729	2.77	0.006	.4207651	2.453533
_y_C						
groupB	1.650385	1.174452	1.41	0.160	-.6514979	3.952269
_cons	-1.010065	.0801261	-1.26	0.207	-2.580508	.5603773

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant 1.44 represents the average difference of log odds ratio between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant -1.01 denotes the average difference of log odds ratio between treatments A (P-A screws) and C in the AC design.

(F) Incidence of non-unions: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
AB	-.1440458	1.167122	.5808861	2.076505	-.7249319	2.382706	0.761
AC	-.1497636	.8231576	-.3433699	2.437137	.1936063	2.572728	0.940
BC	-.4423378	1.433938	.1245603	1.657618	-.5668981	2.191409	0.796

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -15.33458 Number of observations = 9

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B						
des_ABC	-.4079477	2.481334	-0.16	0.869	-5.271274	4.455378
_cons	-.0097875	1.426242	-0.01	0.995	2.80517	2.785595
_y_C						
des_AC	.9443646	2.216909	0.43	0.670	-3.400697	5.289426
des_BC	.5674831	3.206924	0,18	0.860	-5.717972	6.852938
_cons	-.9382696	2.025601	-0.46	0.643	-4.908375	3.031836

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant -0.01 represents the average difference of log odds ratio between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant -0.94 denotes the average difference of log odds ratio between treatments A (P-A screws) and C in the AC design.

(G) Incidence of loss of dorsiflexion ≥ 5 degrees: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
A B *	.2693329	.7259616	1.259487	1.700976	-.9901545	1.914759	0.605
A C	.	.	.	.	.	.	.
B C *	-.9779843	.6045509	.0121702	1.837991	-.9901545	1.914759	0.605

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -1.009088 Number of observations = 2

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B _cons	.4448779	.641702	0.69	0.488	-.8128349	1.702591
_y_C _cons	-.4448146	.477651	-0.93	0.352	-1.380993	.4913641

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant 0.44 represents the average difference of log odds ratio between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant -0.44 denotes the average difference of log odds ratio between treatments A (P-A screws) and C in the AC design.

(H) Incidence of infections: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
AB*	-.800117	1.284897	-.0426915	0.9460424	-.7574255	1.595932	0.635
AC*	.279788	.4838002	-.6682674	1.758577	.948005	1.814128	0.601
BC*	.3925495	.7254338	1.22737	1.596603	-.8348201	1.725889	0.629

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -16.605115 Number of observations = 9

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B						
_cons	-.6980267	1.167725	-0.60	0.550	-2.986726	1.590673
_y_C						
groupB	-.6329755	1.440165	-0.44	0.660	-3.455647	2.189696
_cons	.2603912	.478936	0.54	0.587	-.678306	1.199088

*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant -0.70 represents the average difference of log odds ratio between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant -0.26 denotes the average difference of log odds ratio between treatments A (P-A screws) and C in the AC design.

(I) Incidence of peroneal nerve injuries: a detailed analysis for local side-splitting inconsistency and global design inconsistency

1. Side-splitting inconsistency between direct and indirect evidence

Side	Direct		Indirect		Difference		
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	*P*>|z|
AB	-.4128683	2.030471	-.3158613	1.749149	-.097007	2.681271	0.971
AC*	.2329864	.7309696	2.378235	4.818329	-2.145248	4.872255	0.660
BC*	.4688036	1.279231	2.17737	3.850983	-1.708566	4.055917	0.674

*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

2. Design inconsistency

Multivariate meta-analysis

Variance-covariance matrix = proportional .5*I(2)+.5*J(2,2,1)

Method = reml Number of dimensions = 2

Restricted log likelihood = -11.476316 Number of observations = 5

	Coefficient	Std. err.	z	*P*>|z|	[95% conf.	interval]
_y_B						
_cons	.1742399	1.791823	0.10	0.923	-3.337669	3.686149
_y_C						
groupB	1.073153	2.436732	0.44	0.660	-3.702753	5.849059
_cons	.2329793	.7309681	0.32	0.750	-1.199692	1.66565

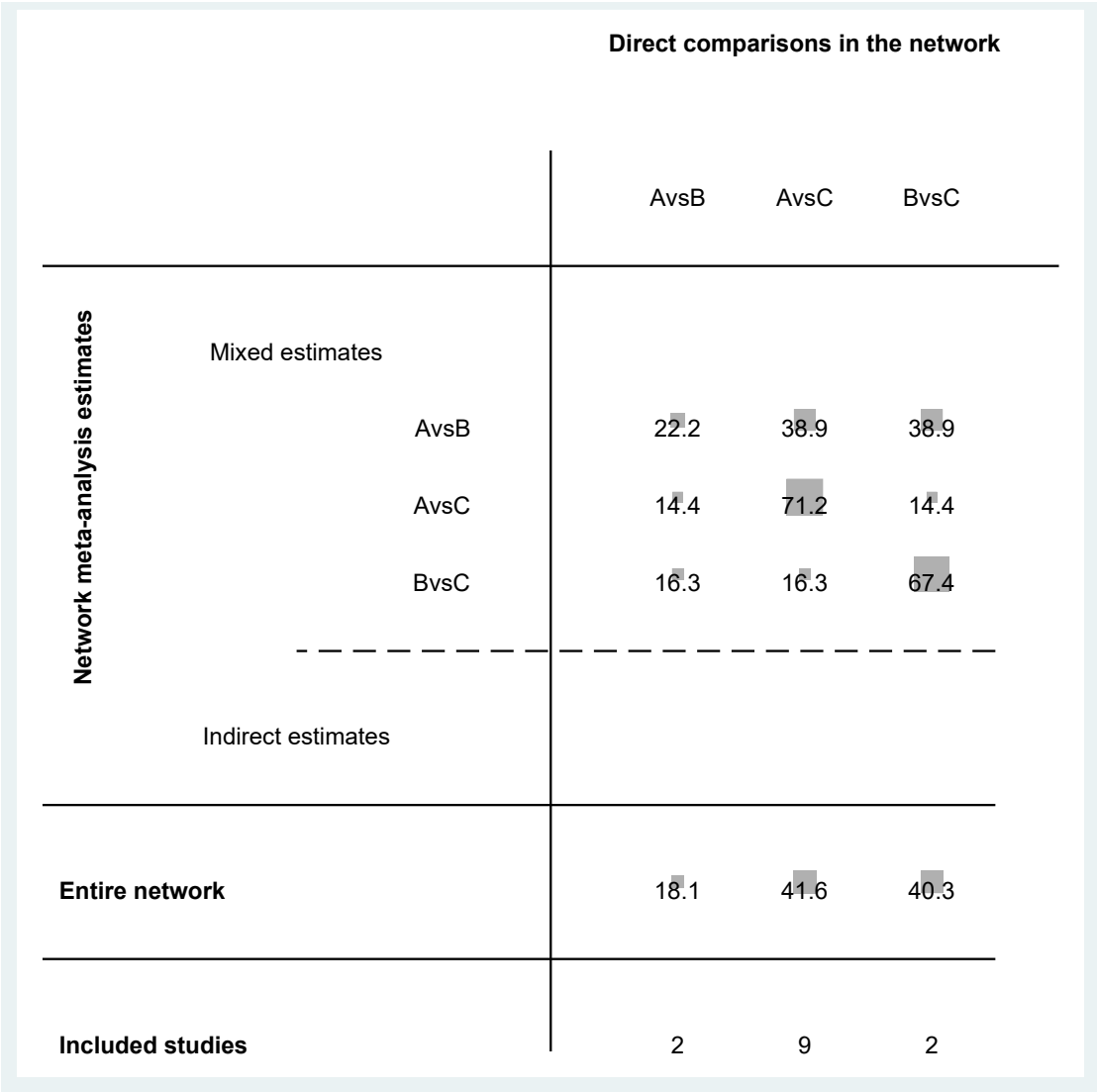
*Symbols for abbreviation: B for A-P screws, anteroposterior (A-P) screws; C for plate

For _y_B, the constant 0.17 represents the average difference of log odds ratio between treatments A (P-A screws) and B in the AB design.

For _y_C, the constant 0.23 denotes the average difference of log odds ratio between treatments A (P-A screws) and C in the AC design.

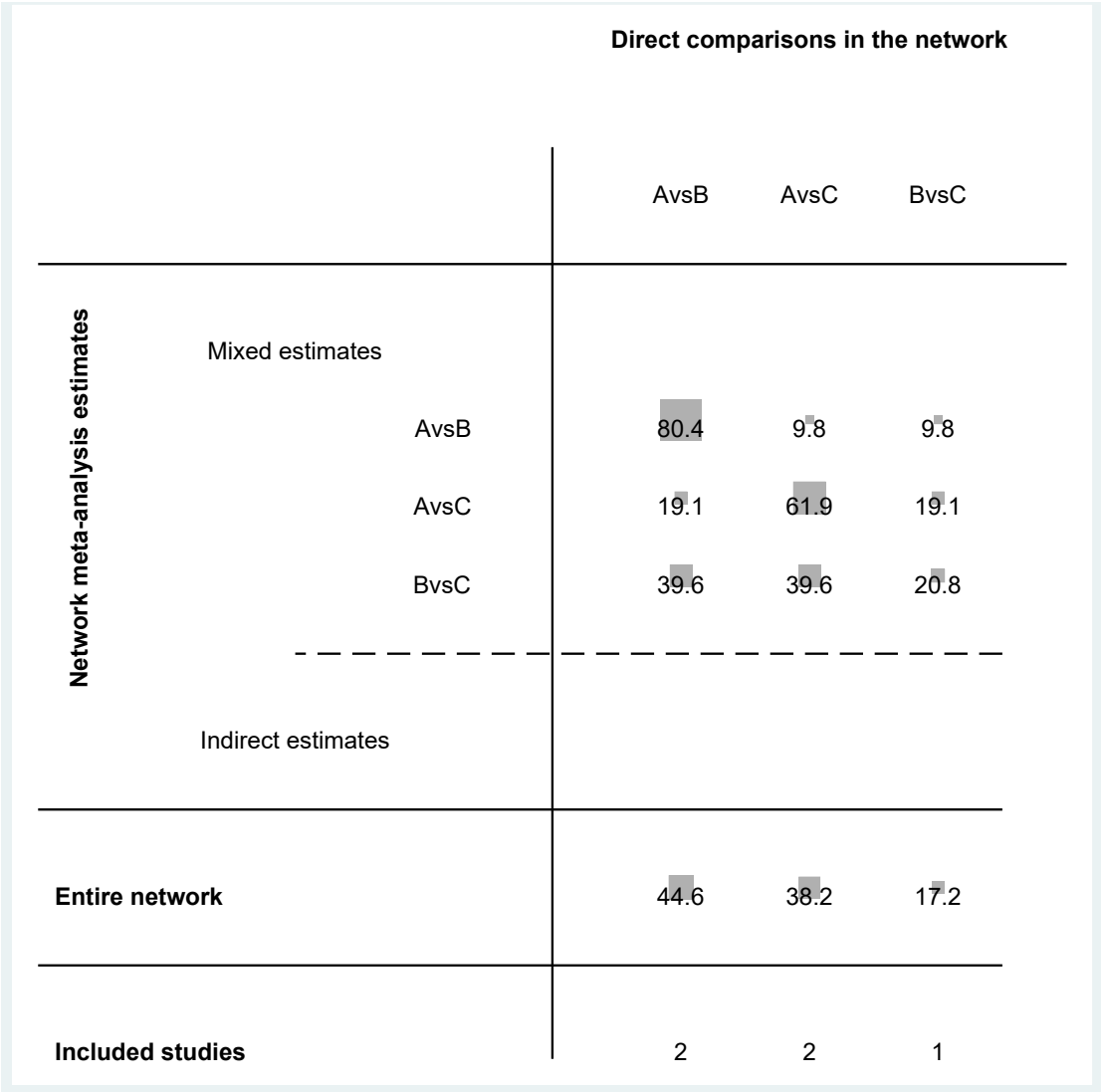
Figure d. Contribution plots

(A) AOFAS changes



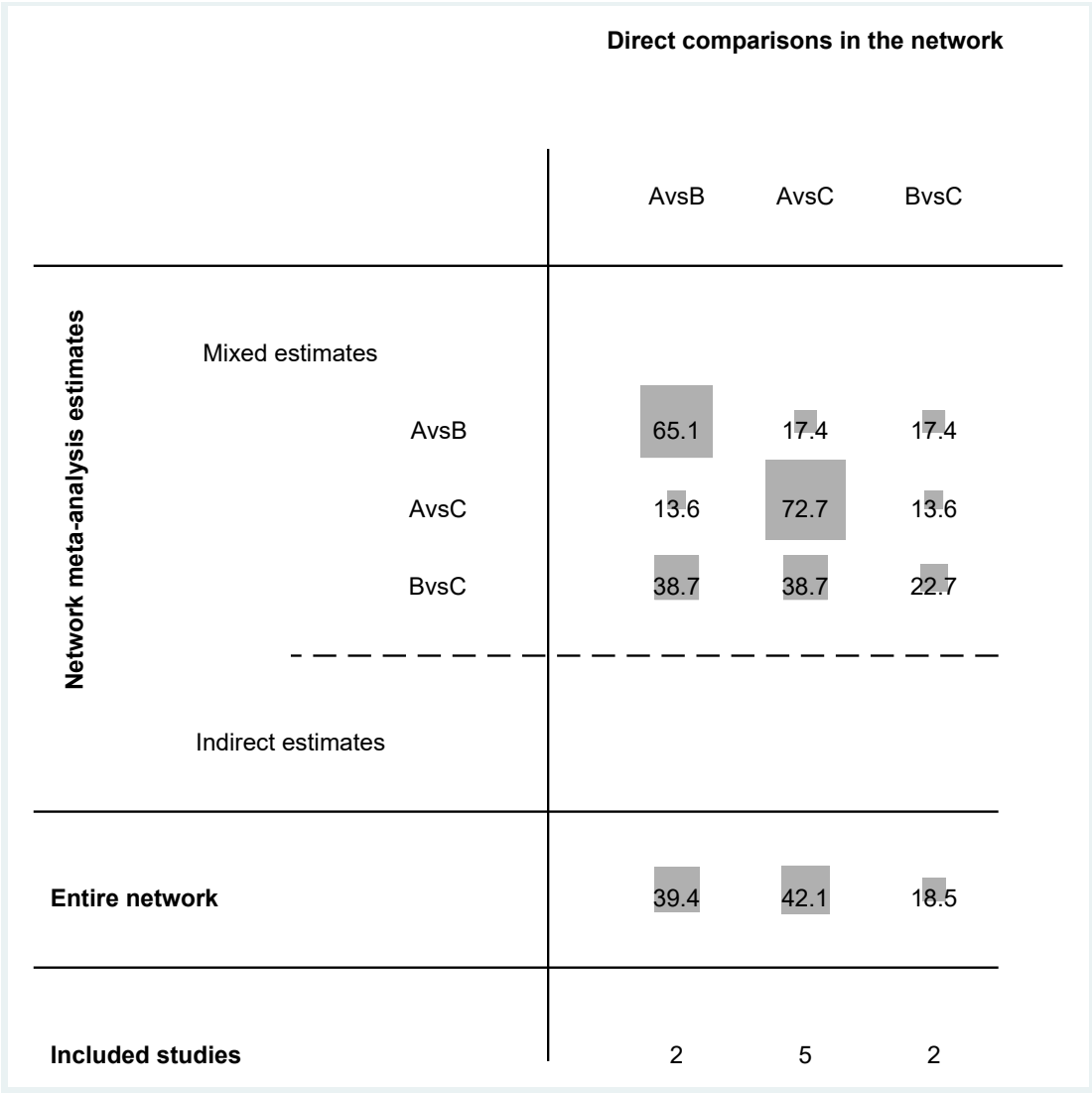
*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate; AOFAS changes, changes in The American Orthopedic Foot and Ankle Score

(B) VAS changes



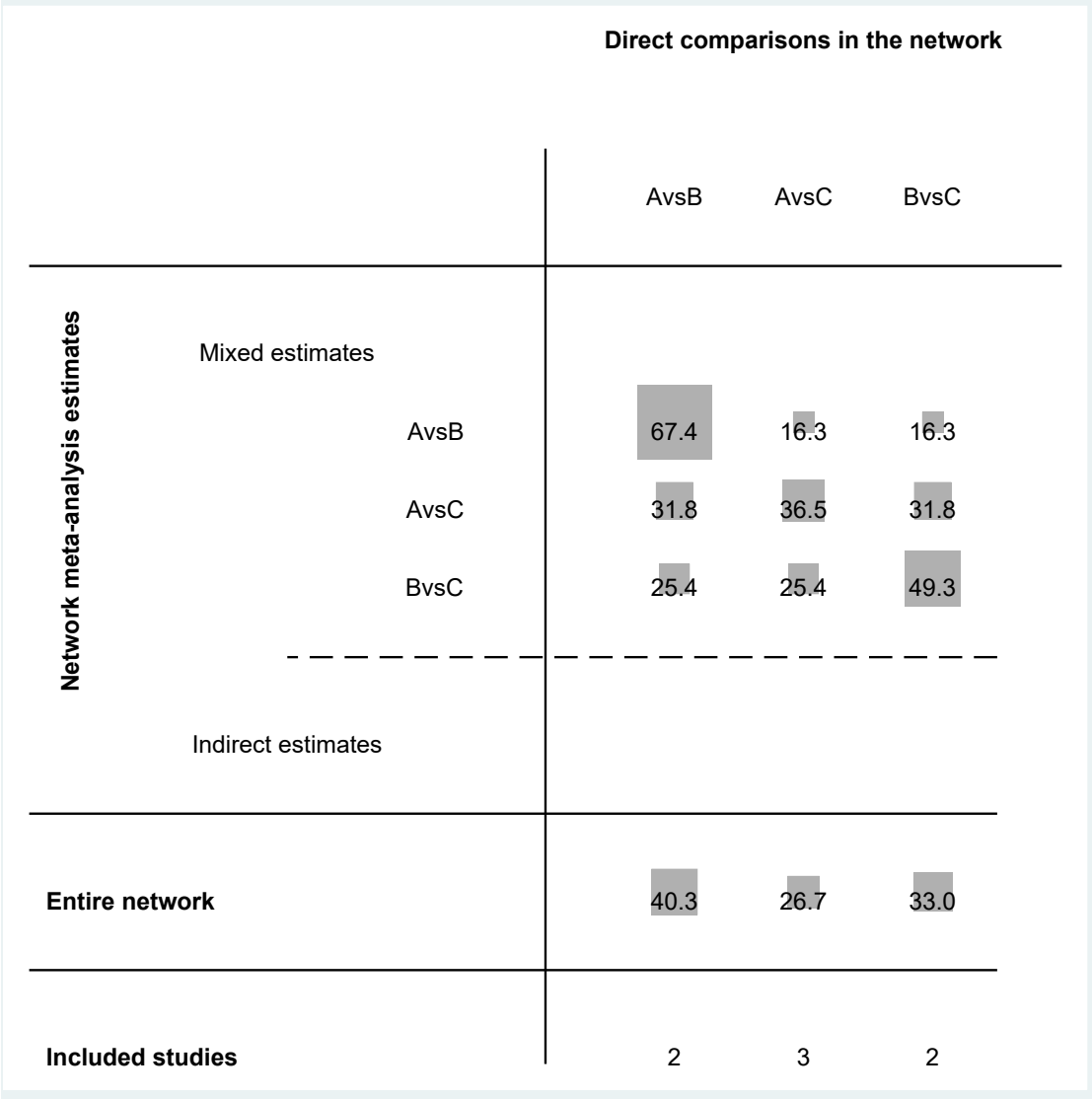
*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate; VAS changes, changes in Visual Analogue Scale

(C) The incidence of osteoarthritis grade progression



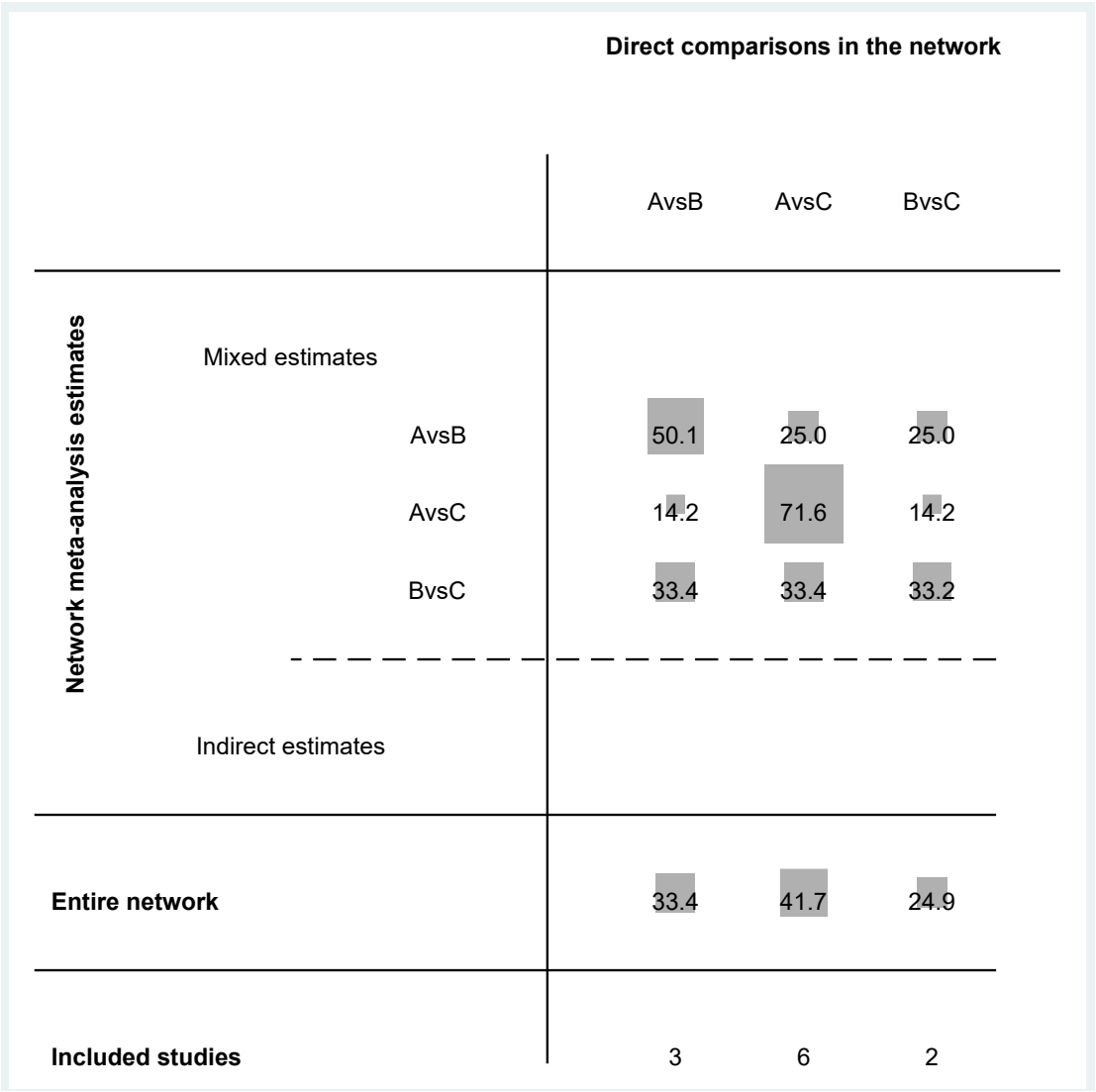
*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

(D) The incidence of step-off ≥ 2mm



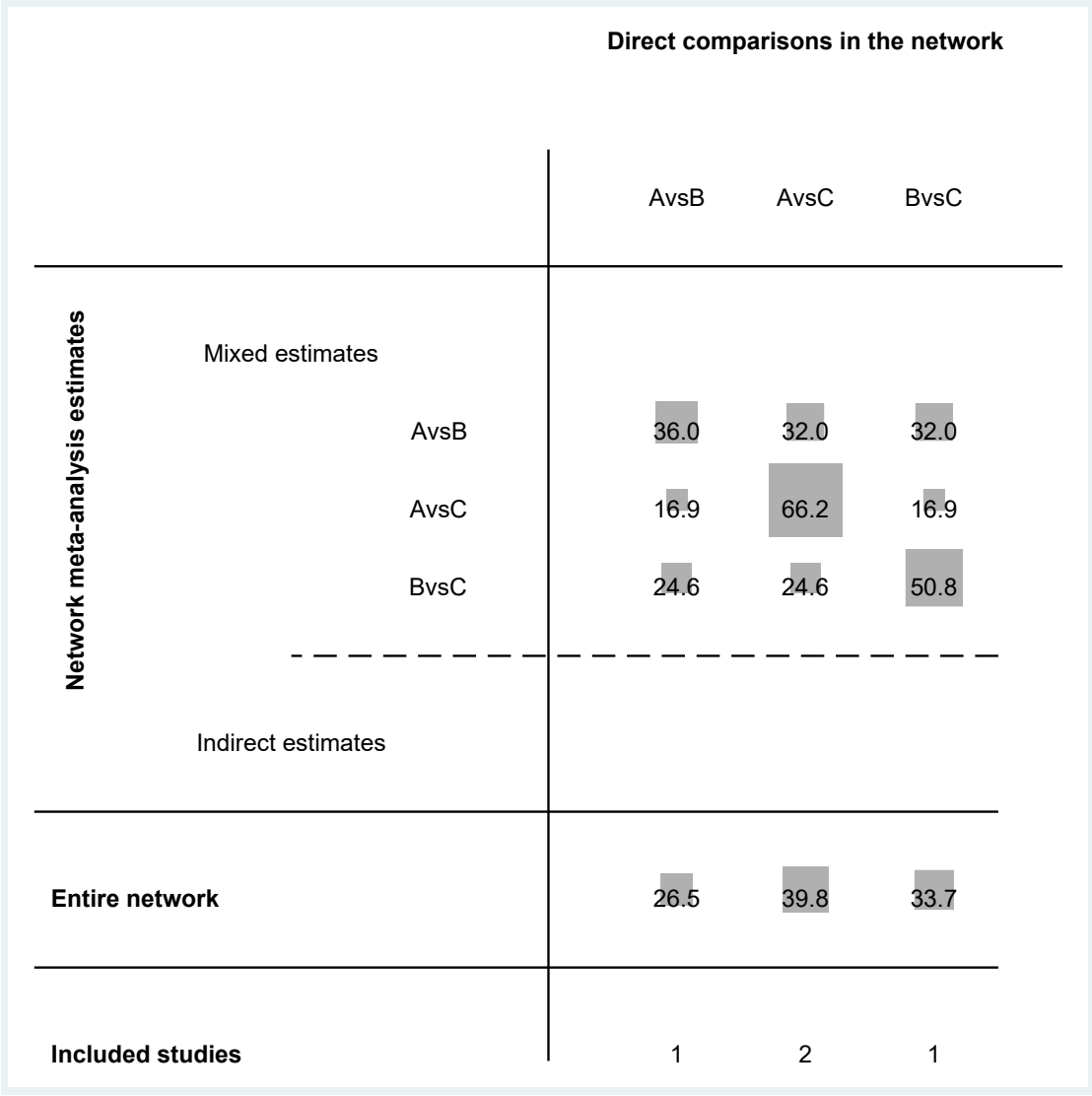
*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

(E) The incidence of non-unions



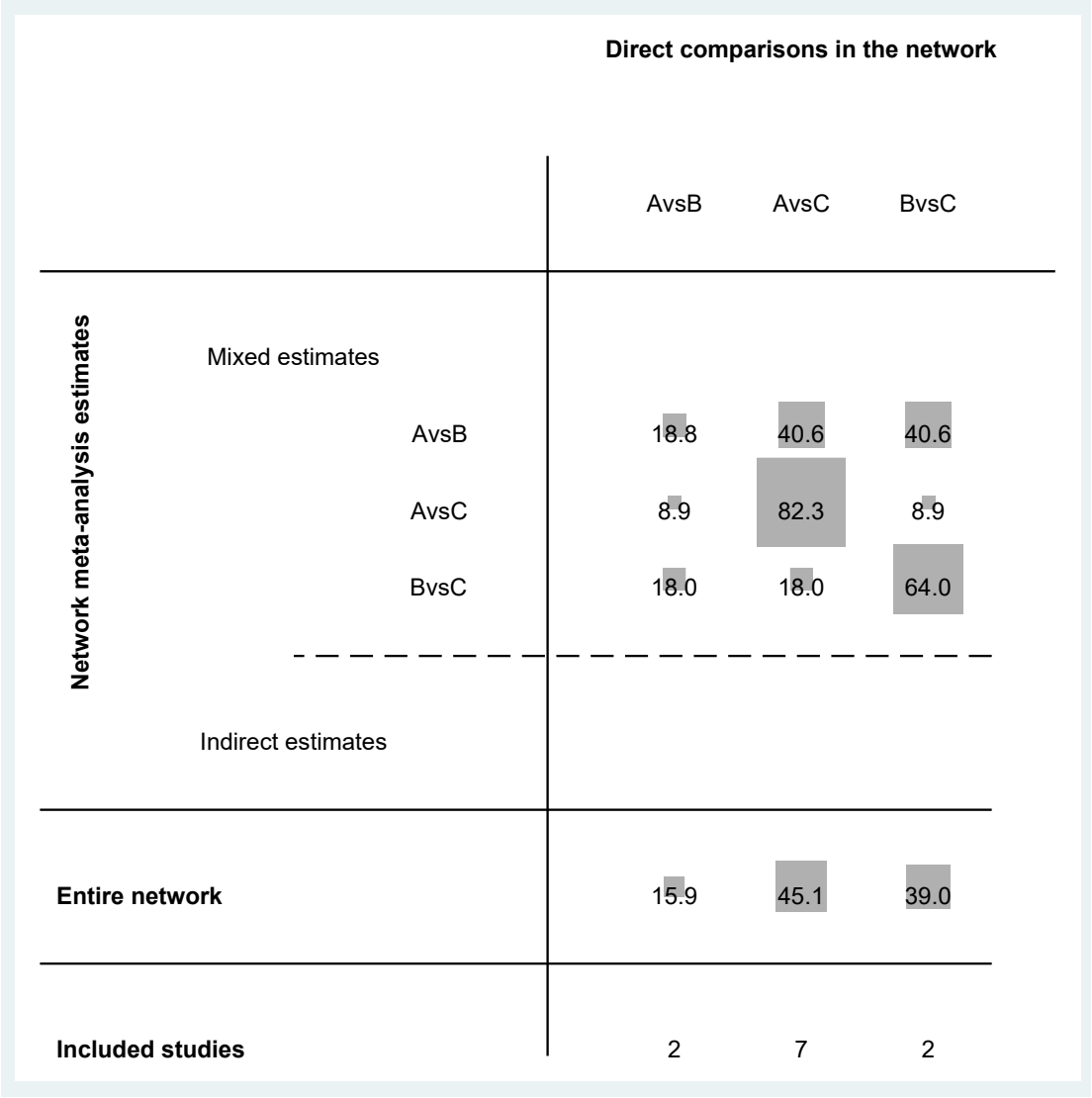
*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

(F) The incidence of loss of dorsiflexion ≥ 5 degrees



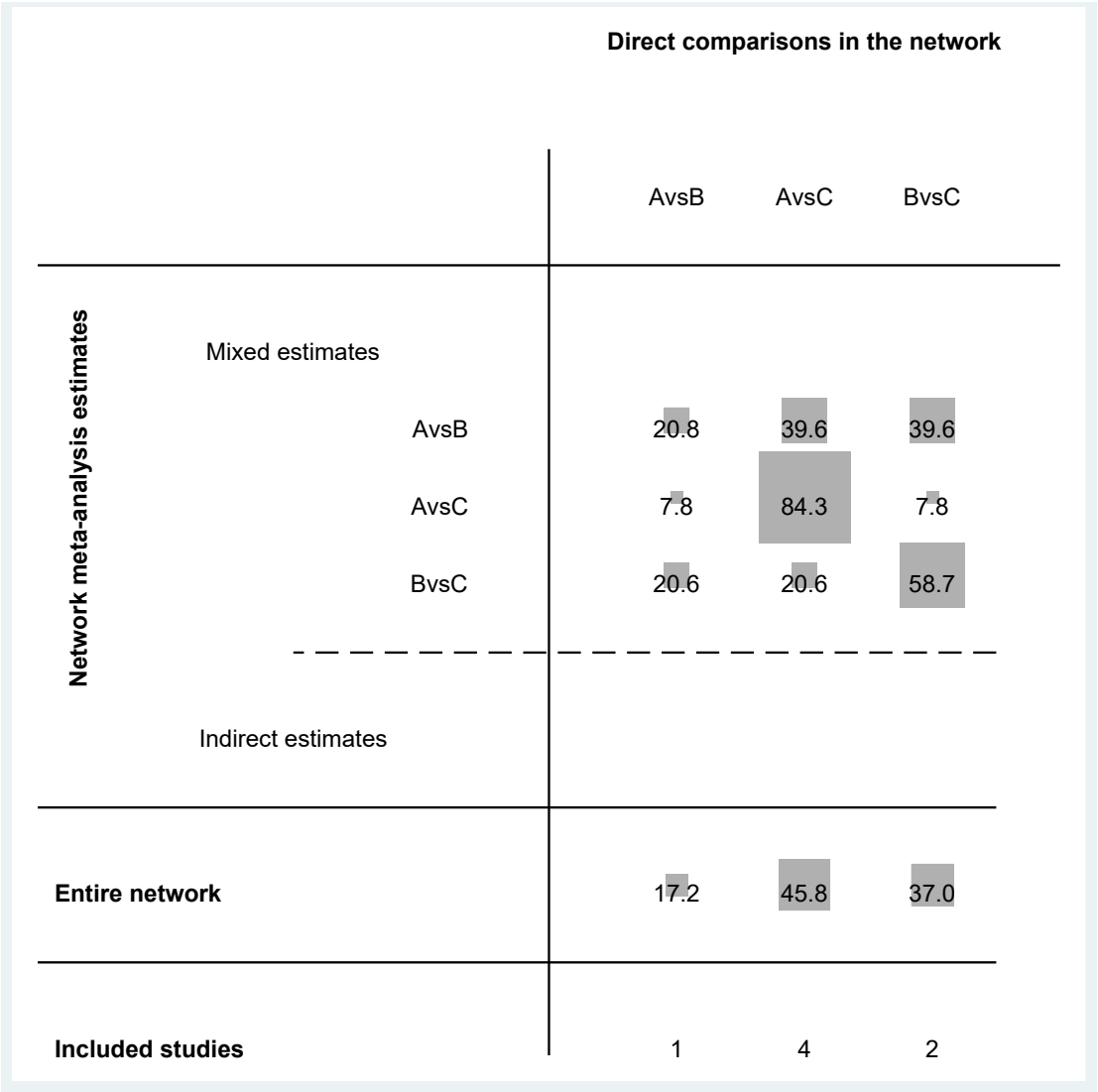
*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

(G) The incidence of infections



*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate

(H) The incidence of peroneal nerve injuries



*Symbols for abbreviation: A for P-A screws, posteroanterior (P-A) screws; B for A-P screws, anteroposterior (A-P) screws; C for plate