Search strategy

Embase（Performed on 31 September 2022）

#1	'real time ultrasound guided' OR 'ultrasound assisted' OR 'landmark palpation' OR 'traditional positioning'
#2	'spinal anesthesia'/exp OR 'spinal anesthesia' OR 'epidural anesthesia'/exp OR 'epidural anesthesia' OR 'combined spinal and epidural anesthesia'
#3	#1 AND #2 AND [controlled clinical trial]/lim

PubMed（Performed on 31 September 2022）

#1	real time ultrasound guided OR ultrasound assisted OR landmark palpation OR traditional positioning
#2	spinal anesthesia OR epidural anesthesia OR combined spinal and epidural anesthesia
#3	#1 AND #2 (Filters applied: Randomized Controlled Trial)

Web of science（Performed on 31 September 2022）

#1	TS=(real time ultrasound guided OR ultrasound assisted OR landmark palpation OR traditional positioning)
#2	TS=(spinal anesthesia OR epidural anesthesia OR combined spinal and epidural anesthesia)
#3	#1 AND #2 and Clinical Trial

Cochrane Library（Performed on 31 September 2022）

#1	("real time ultrasound guided" OR "ultrasound assisted" OR "landmark palpation" OR "traditional positioning")
#2	("spinal anesthesia" OR "epidural anesthesia" OR "combined spinal and epidural anesthesia")
#3	#1 AND #2 in Trials(search limit)

Inconsistency analysis, local inconsistency test, consistency analysis, ring inconsistency detection of each outcome index

First pass

Inconsistency analysis

Chi2（3）=1.82 Prob ＞ chi2 = 0.6113

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	0.488	0.162	0.596	0.45	-0.108	0.481	0.822	0.511
AC	0.526	0.262	0.719	0.375	-0.194	0.455	0.671	0.518
BC	0.099	0.287	0.074	0.340	0.026	0.466	0.954	0.517

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	0.498	0.148	3.36	0.001	0.207,0.788
A-C	0.584	0.208	2.81	0.005	0.176,0.992

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2
A-B-C	0.083	0.667	0.125	0.901	(0.00,1.39)	0.228

First attempt

Inconsistency analysis

Chi2（3）=1.92　Prob ＞ chi2 = 0.5887

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	0.412	0.134	0.449	0.345	-0.037	0.371	0.920	0.365
AC	0.369	0.166	0.592	0.320	-0.223	0.359	0.534	0.364
BC	0.037	0.237	-0.034	0.234	0.071	0.333	0.830	0.367

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	0.415	0.120	3.44	0.001	0.179,0.651
A-C	0.413	0.144	2.87	0.004	0.131,0.695

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2
A-B-C	0.126	0.319	0.395	0.693	(0.00,0.75)	0.106

Identify time

Inconsistency analysis

Chi2（3）=6.42　Prob ＞ chi2 = 0.0928

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	1.528	0.568	5.956	1.717	-4.427	1.809	0.014	1.678
AC	3.139	1.145	0.512	1.497	2.627	1.885	0.163	1.941
BC	-0.949	1.076	2.273	1.455	-3.222	1.810	0.075	1.851

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	1.977	0.644	3.07	0.002	0.715,3.204
A-C	2.174	0.943	2.30	0.021	0.176,4.023

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2
A-B-C	2.378	1.745	1.363	0.173	(0.00,5.80)	2.322

Time of procedure spinal

Inconsistency analysis

Chi2（3）=7.30 Prob ＞ chi2 = 0.0629

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	-0.790	0.356	0.657	1.360	-1.447	1.405	0.303	0.913
AC	1.401	0.628	-0.323	0.864	1.724	1.065	0.106	0.834
BC	1.342	0.710	1.844	1.027	-0.501	1.247	0.688	0.975

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	-0.697	0.348	-2.01	0.045	-1.378,-0.016
A-C	0.806	0.557	1.45	0.148	-0.286,1.899

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2
A-B-C	0.890	1.119	0.796	0.426	(0.00,3.08)	0.932

subgroup analysis

Obesity/Maternity

First pass

Inconsistency analysis

Chi2（3）=0.29 Prob ＞ chi2 = 0.5896

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	0.454	0.195	0.076	0.665	0.378	0.698	0.588	0.435
AC	0.636	0.541	1.012	0.441	-0.376	0.698	0.590	0.435
BC	0.559	0.389	0.182	0.575	0.377	0.698	0.589	0.435

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	0.419	0.165	2.54	0.011	0.096,0.743
A-C	0.845	0.310	2.73	0.006	0.238,1.452

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2
A-B-C	0.257	0.732	0.351	0.726	(0.00,1.69)	0.094

First attempt

Inconsistency analysis

Chi2（3）=1.47　Prob ＞ chi2 = 0.2260

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	0.545	0.325	-0.529	0.825	1.074	0.887	0.226	0.539
AC	0.251	0.555	1.325	0.692	-1.074	0.887	0.226	0.539
BC	0.780	0.610	-0.294	0.643	1.074	0.887	0.226	0.539

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	0.403	0.322	1.25	0.210	-0.227,1.033
A-C	0.678	0.462	1.47	0.142	-0.227,1.583

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2
A-B-C	1.072	0.890	1.204	0.228	(0.00,2.82)	0.272

Elderly/Abnormal Spinal Anatomy

First attempt

Inconsistency analysis

Chi2（3）=0.33　Prob ＞ chi2 = 0.5674

local inconsistency test（node-splitting method）

Side	Direct Coef.	Std. Err.	Indierect Coef.	Std. Err.	Difference Coef.	Std. Err.	P＞|z|	tau
AB	0.663	0.114	0.536	0.191	0.128	0.223	0.567	0.000
AC	0.108	0.129	0.236	0.182	-0.127	0.223	0.567	0.000
BC	-0.427	0.141	-0.555	0.172	0.127	0.223	0.567	0.000

consistency analysis

	Coef.	Std. Err.	z	P＞|z|	[95% Conf. Interval]
A-B	0.630	0.098	6.41	0.000	0.437,0.822
A-C	0.151	0.105	1.43	0.151	-0.055,0.357

ring inconsistency detection

Loop	IF	seIF	z_value	P_value	CI_95	Loop_Heterog_tau2

A-B-C	0.127	0.223	0.572	0.567	(0.00,0.56)	0.000

A：Traditional positioning B:Ultrasound assistance C: Real-time guidance

Figure 1S

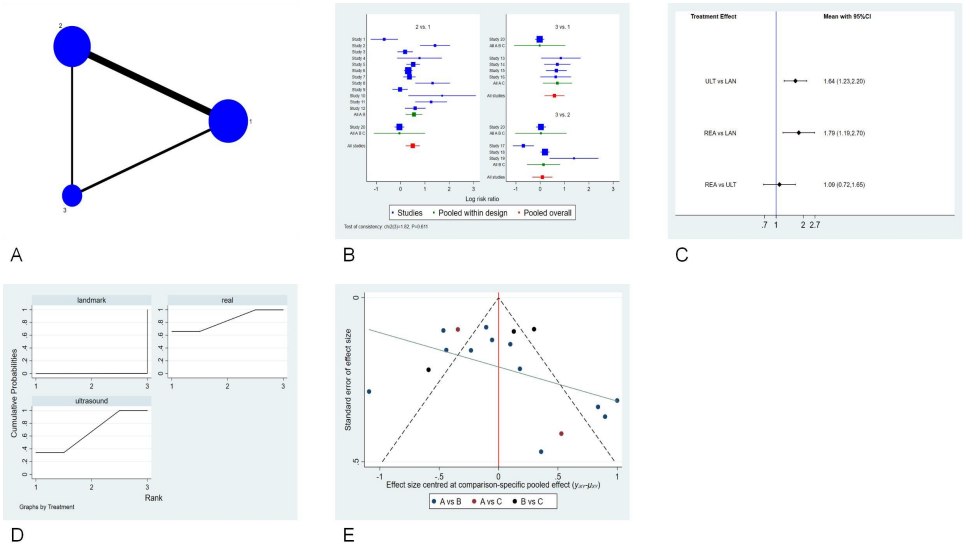


Figure 2S

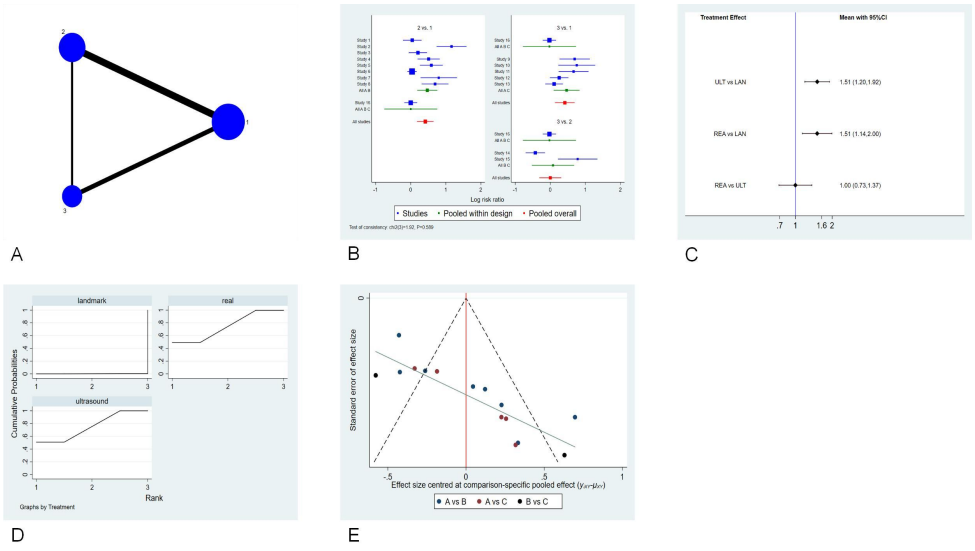


Figure 3S

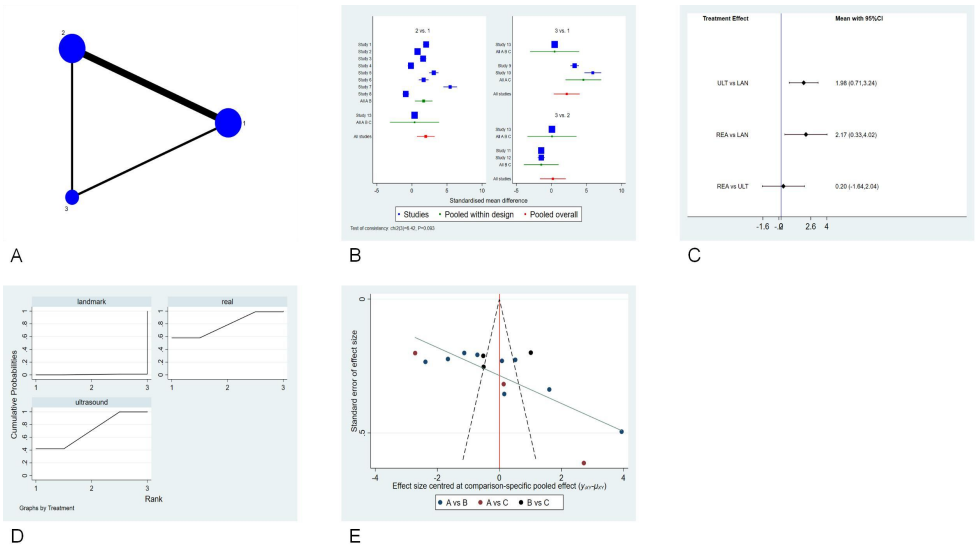


Figure 4S

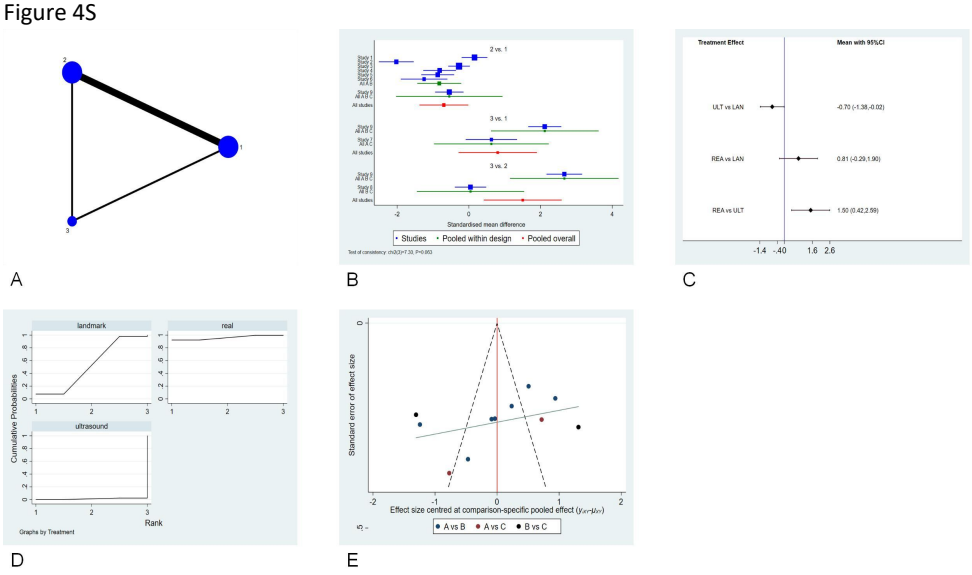


Figure 5S

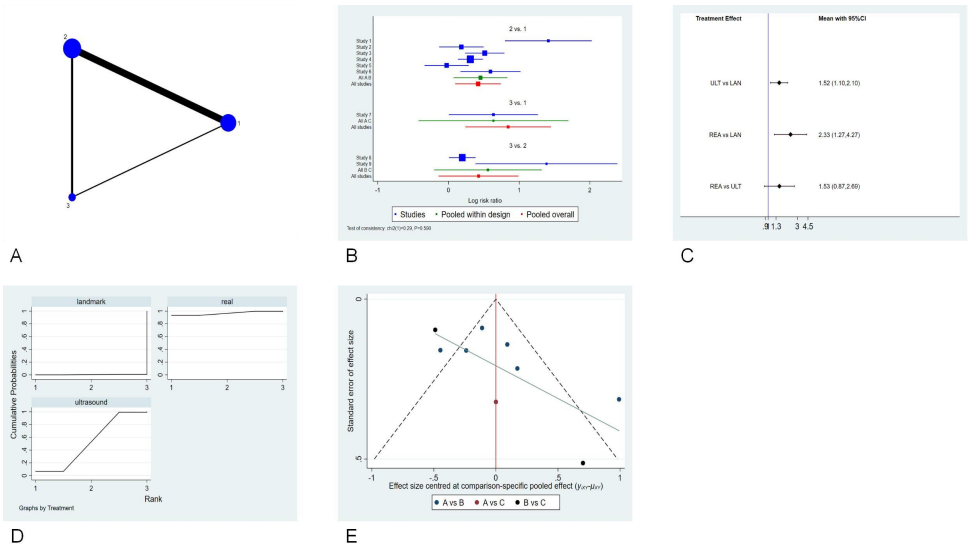


Figure 6S

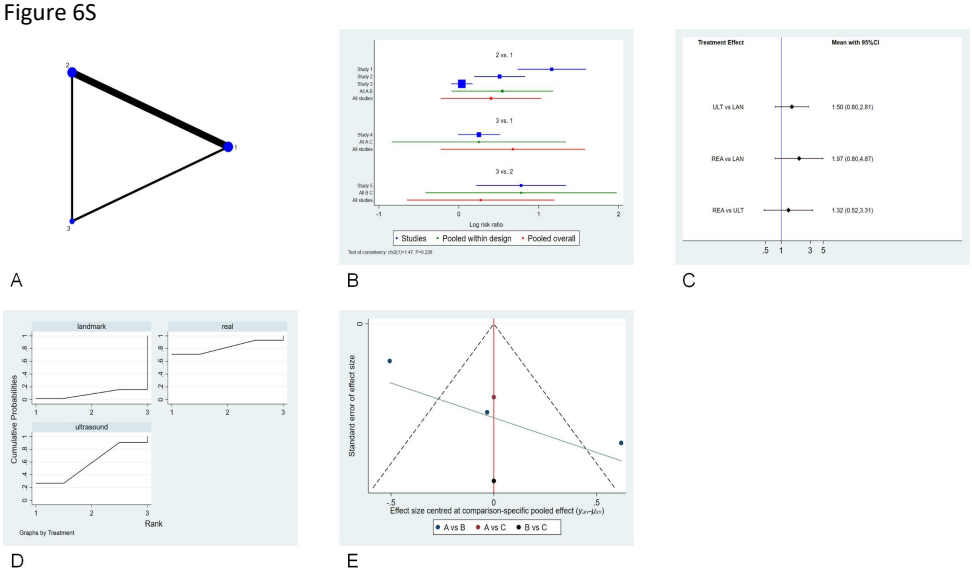
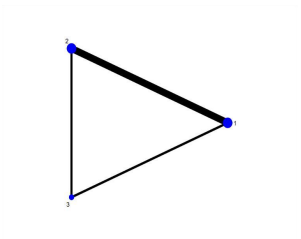
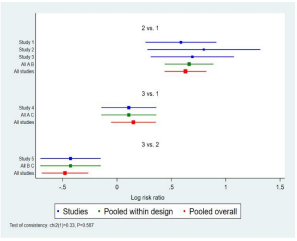


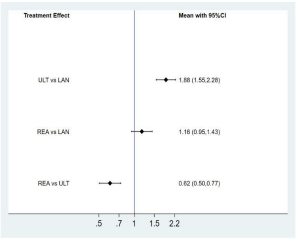
Figure 7S


2
1
3

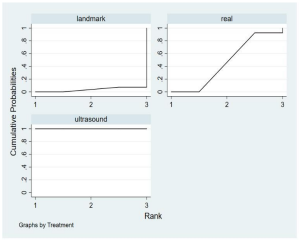
A


2 vs. 1
3 vs. 1
3 vs. 2
Log risk ratio
Studies
Pooled within design
Pooled overall

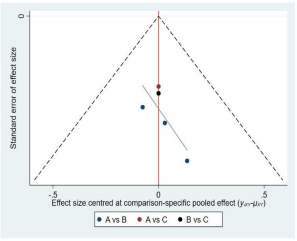
B


Treatment Effect
Mean with 95%CI
ULT vs LAN
1.88 (1.55,2.28)
REA vs LAN
1.16 (0.95,1.43)
REA vs ULT
0.62 (0.50,0.77)

C


landmark
real
ultrasound
Cumulative Probabilities
Rank
Graphs by Treatment

D


Standard error of effect size
Effect size centred at comparison-specific pooled effect
A vs B
A vs C
B vs C

E