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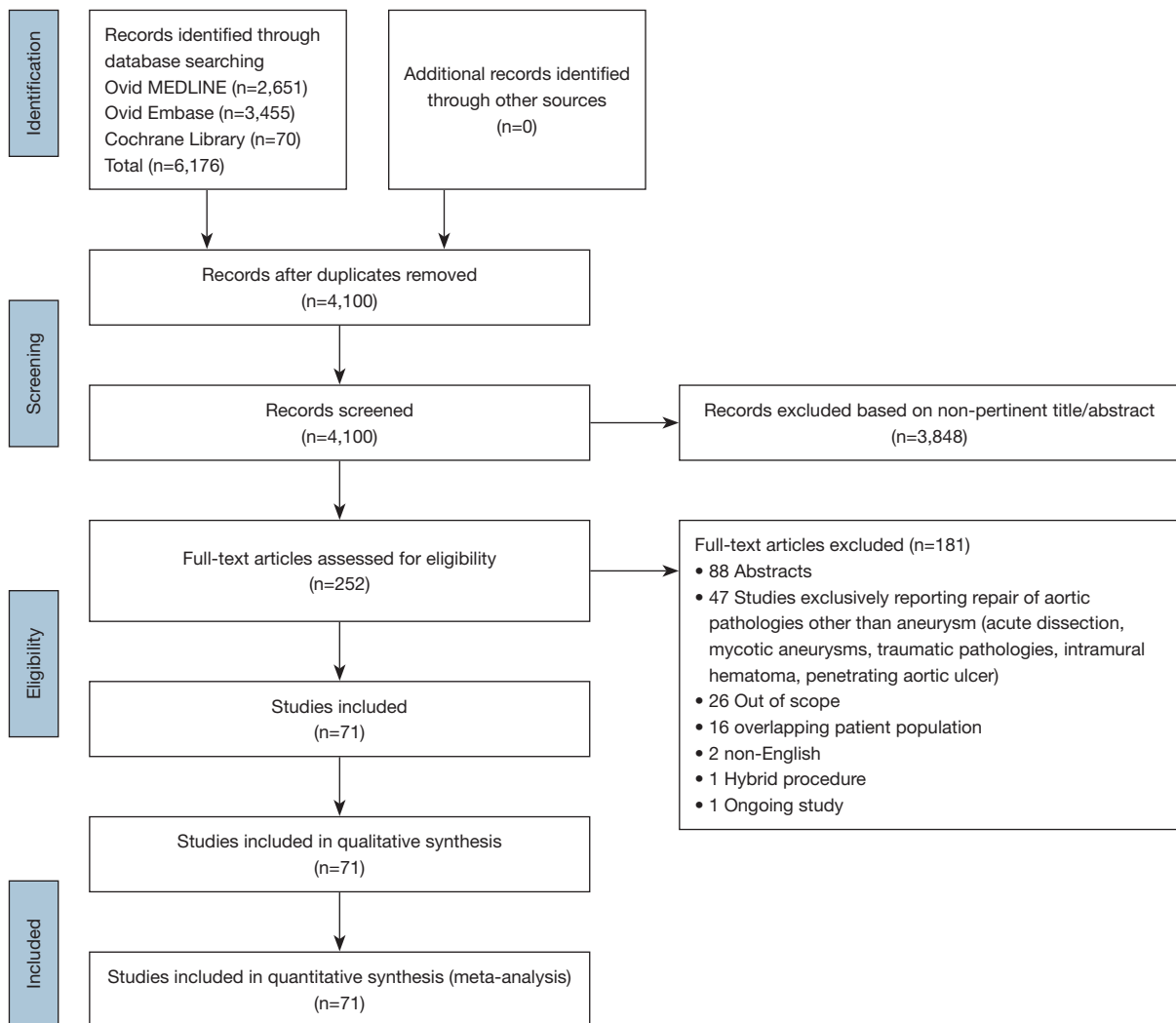


Figure S1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart of our analysis.

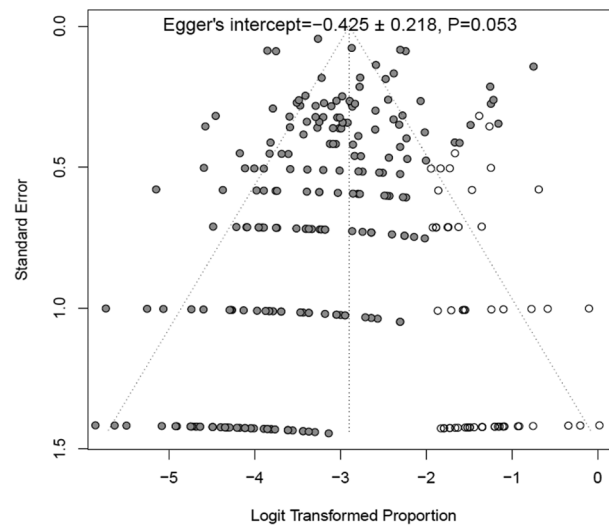
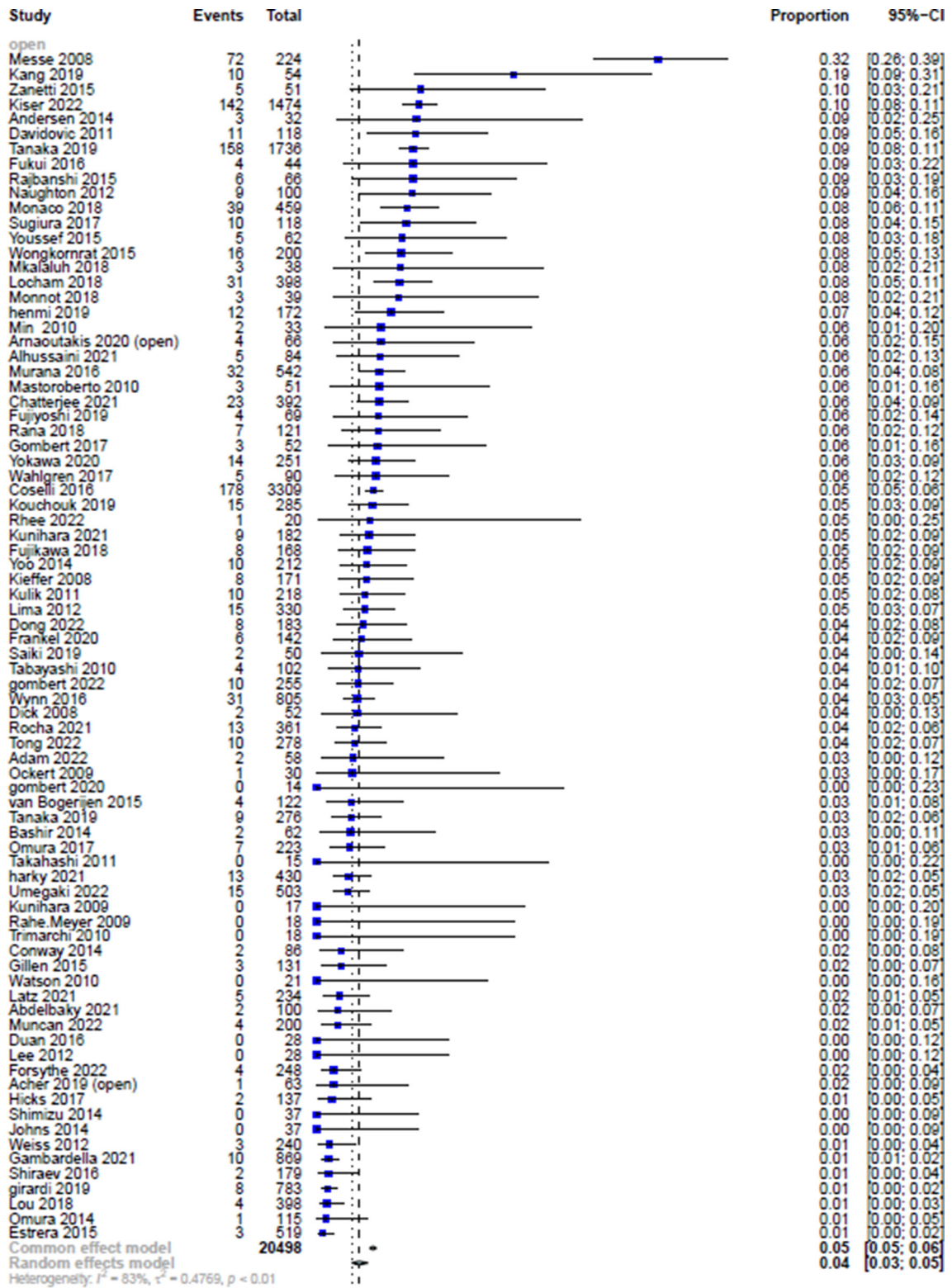
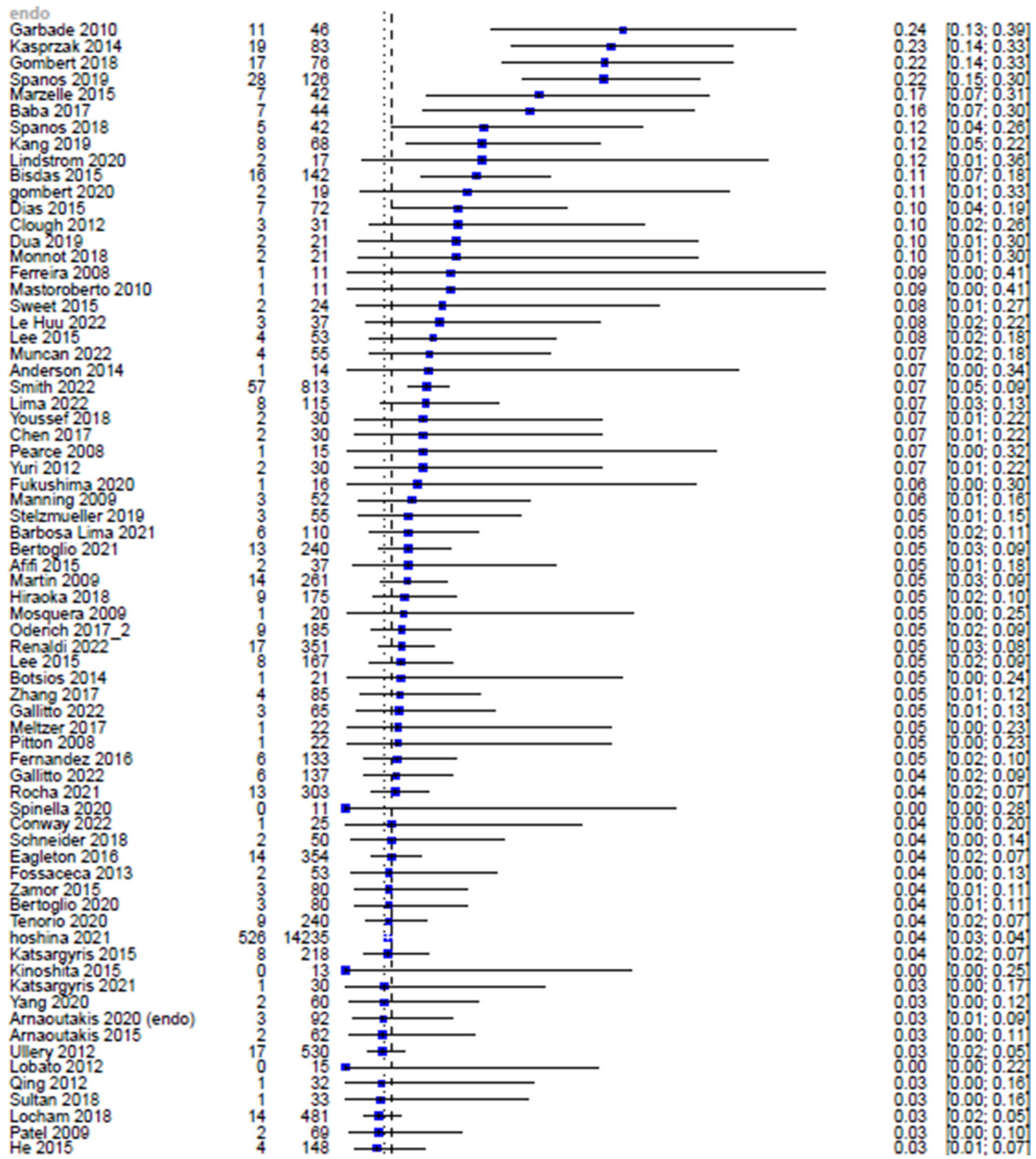


Figure S2 Funnel plot for studies reporting the primary outcome. The gray circles represent each included study (logit transformed proportion, standard error), while the white circles represent the visual assessment of asymmetry using Trim and fill method in addition to statistical assessment using Egger's test.





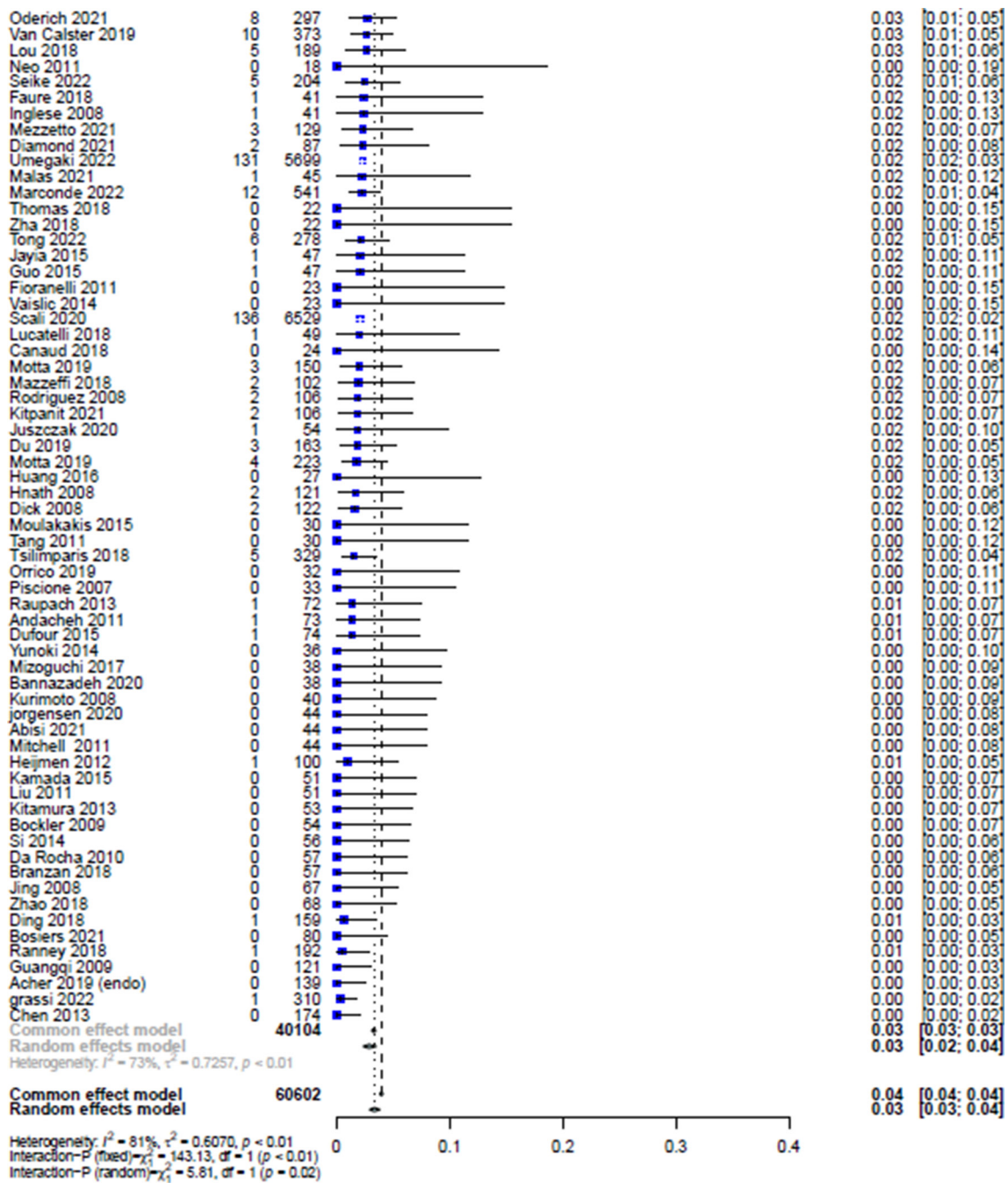
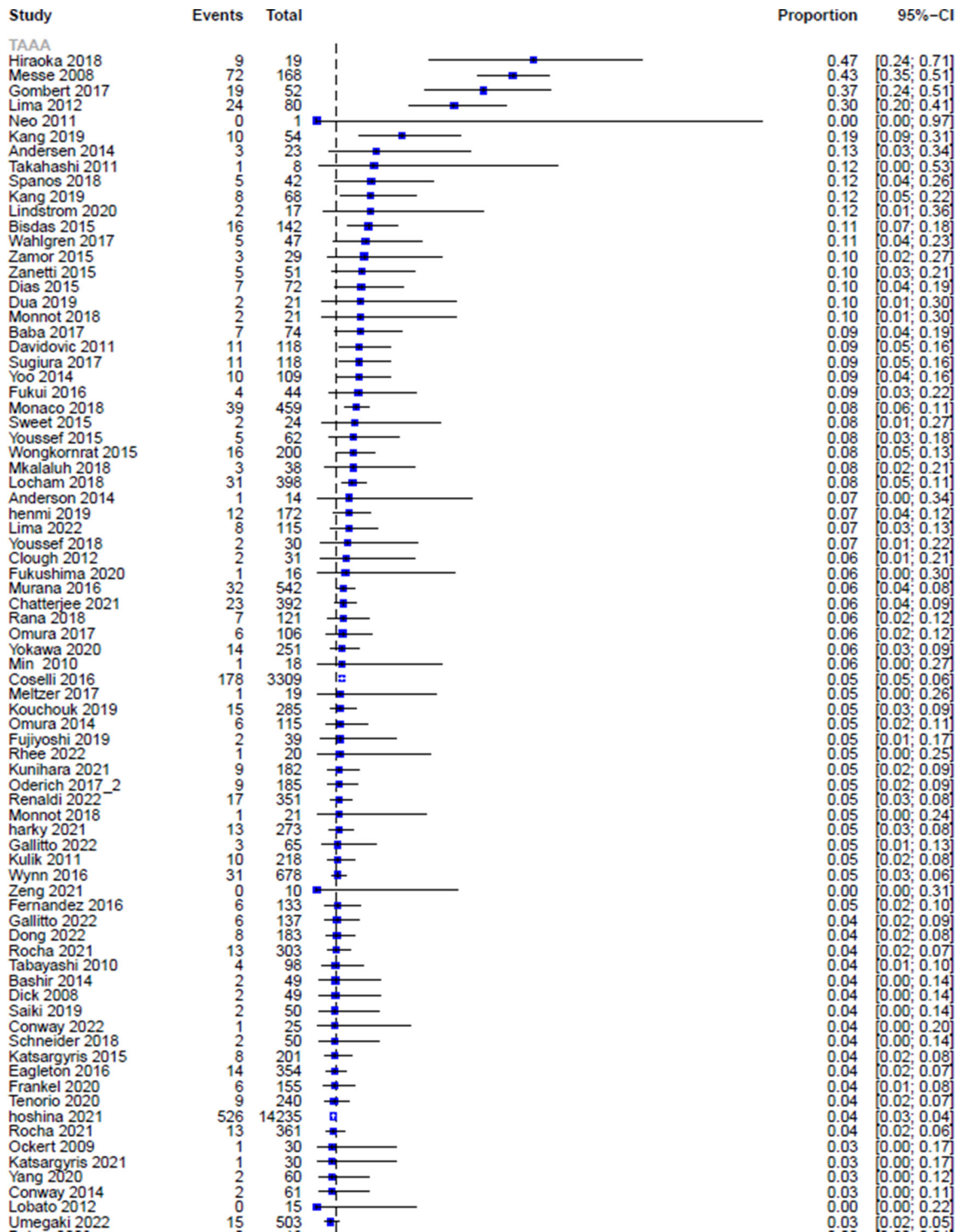


Figure S3 Sub-group analysis of permanent spinal cord injury after open vs. endovascular aneurysm repair. CI, confidence interval.



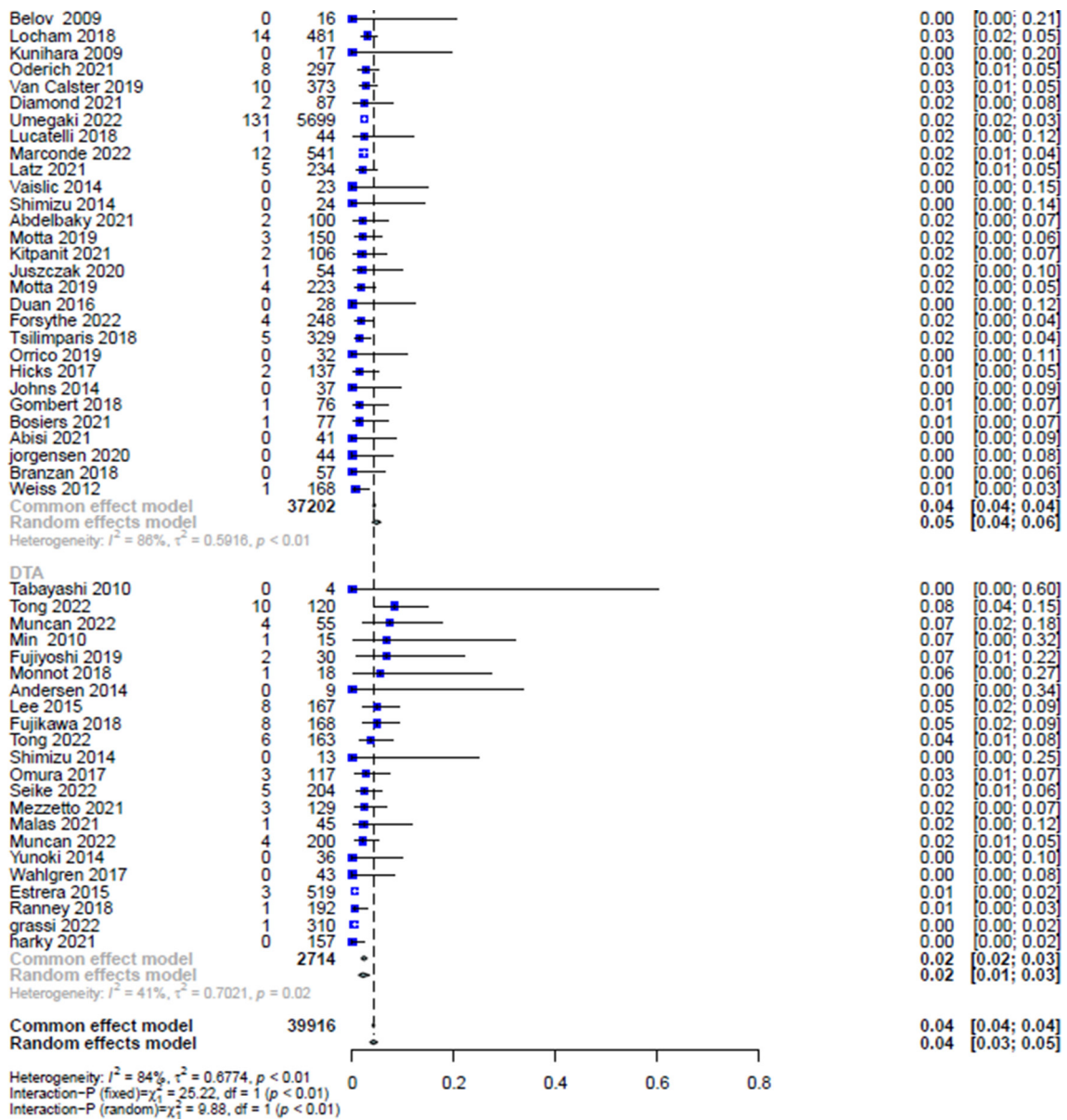


Figure S4 Sub-group analysis of permanent spinal cord injury after repair of TAAA vs. DTA. CI, confidence interval; TAAA, thoracoabdominal aortic aneurysm; DTA, descending thoracic aneurysm.

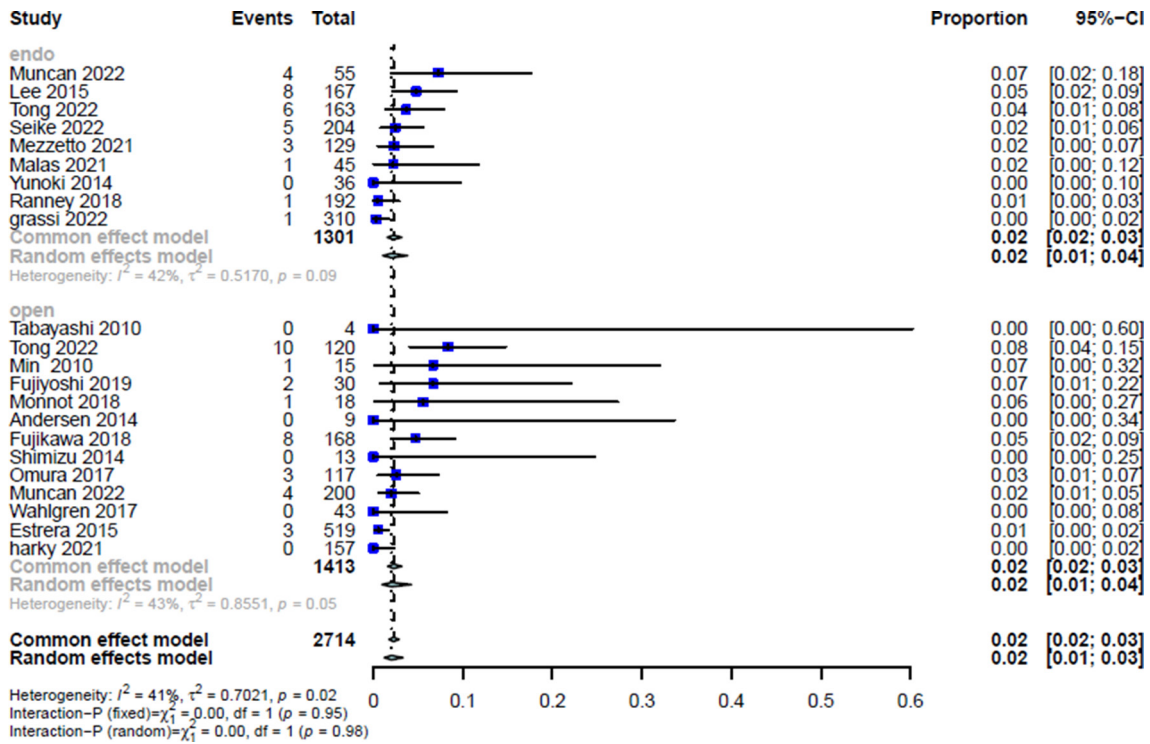
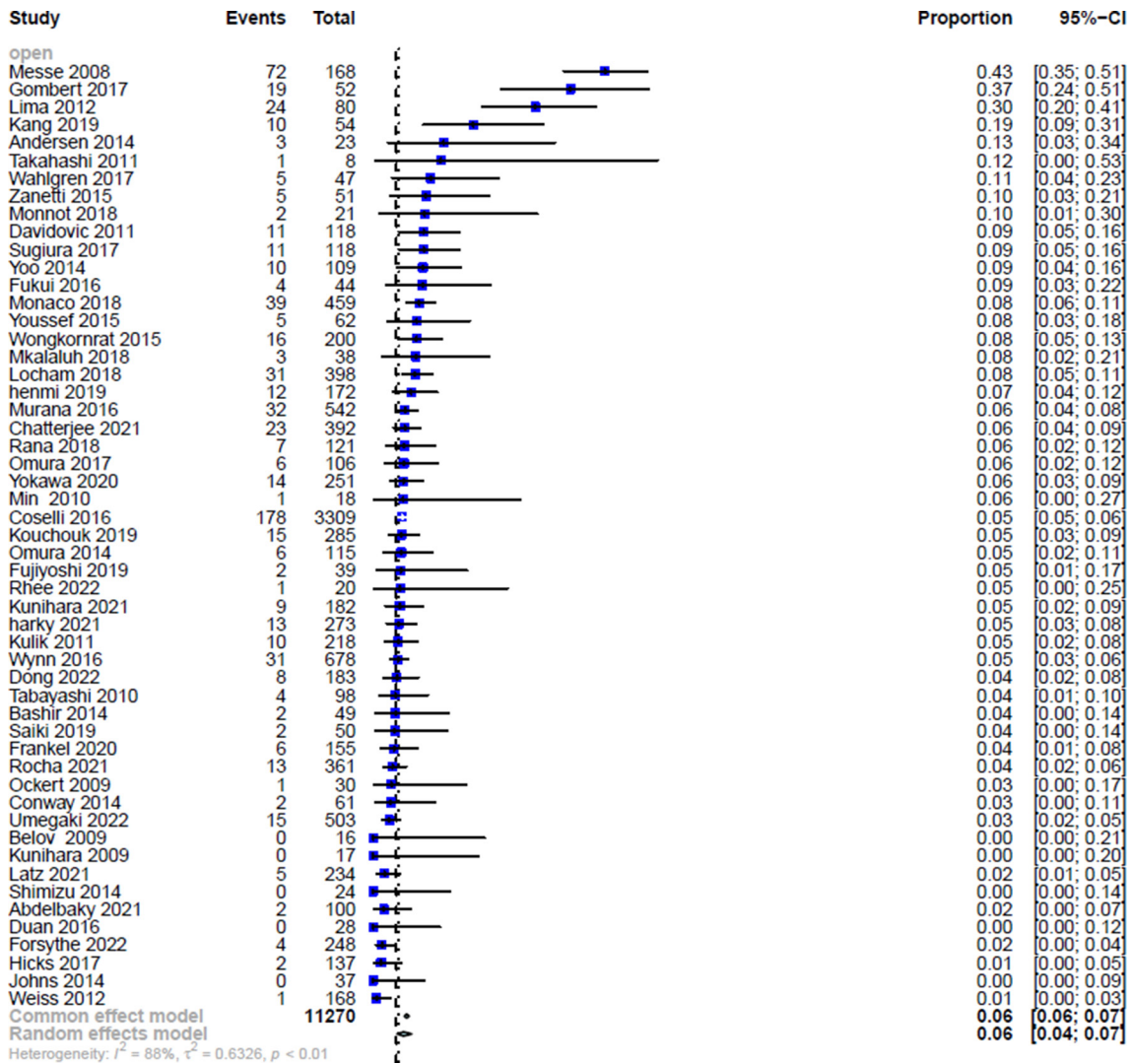


Figure S5 Sub-group analysis of permanent spinal cord injury for endovascular vs. open repair of descending thoracic aneurysms. CI, confidence interval.



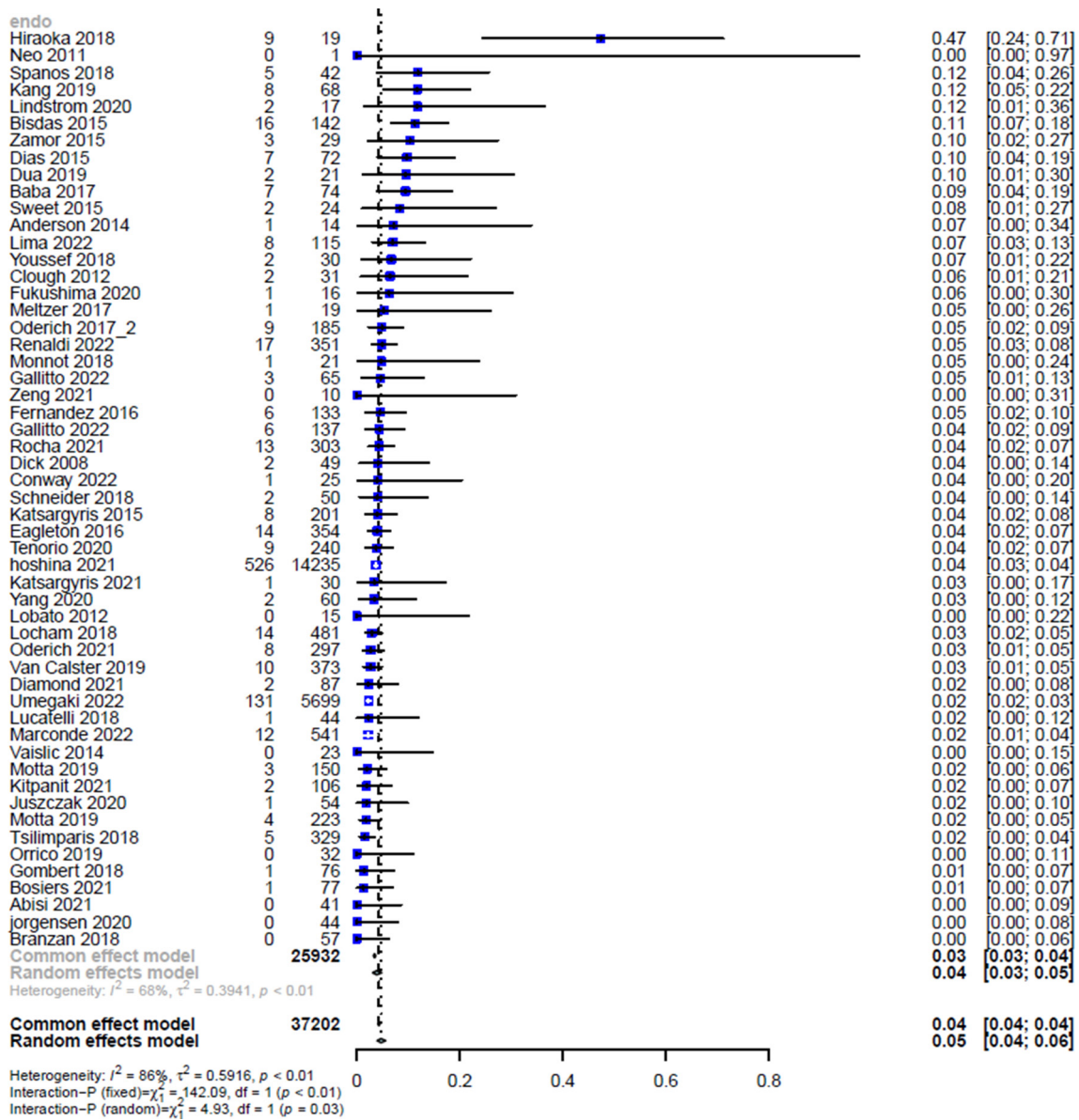


Figure S6 Sub-group analysis of permanent spinal cord injury for open vs. endovascular repair of thoracoabdominal aortic aneurysms. CI, confidence interval.

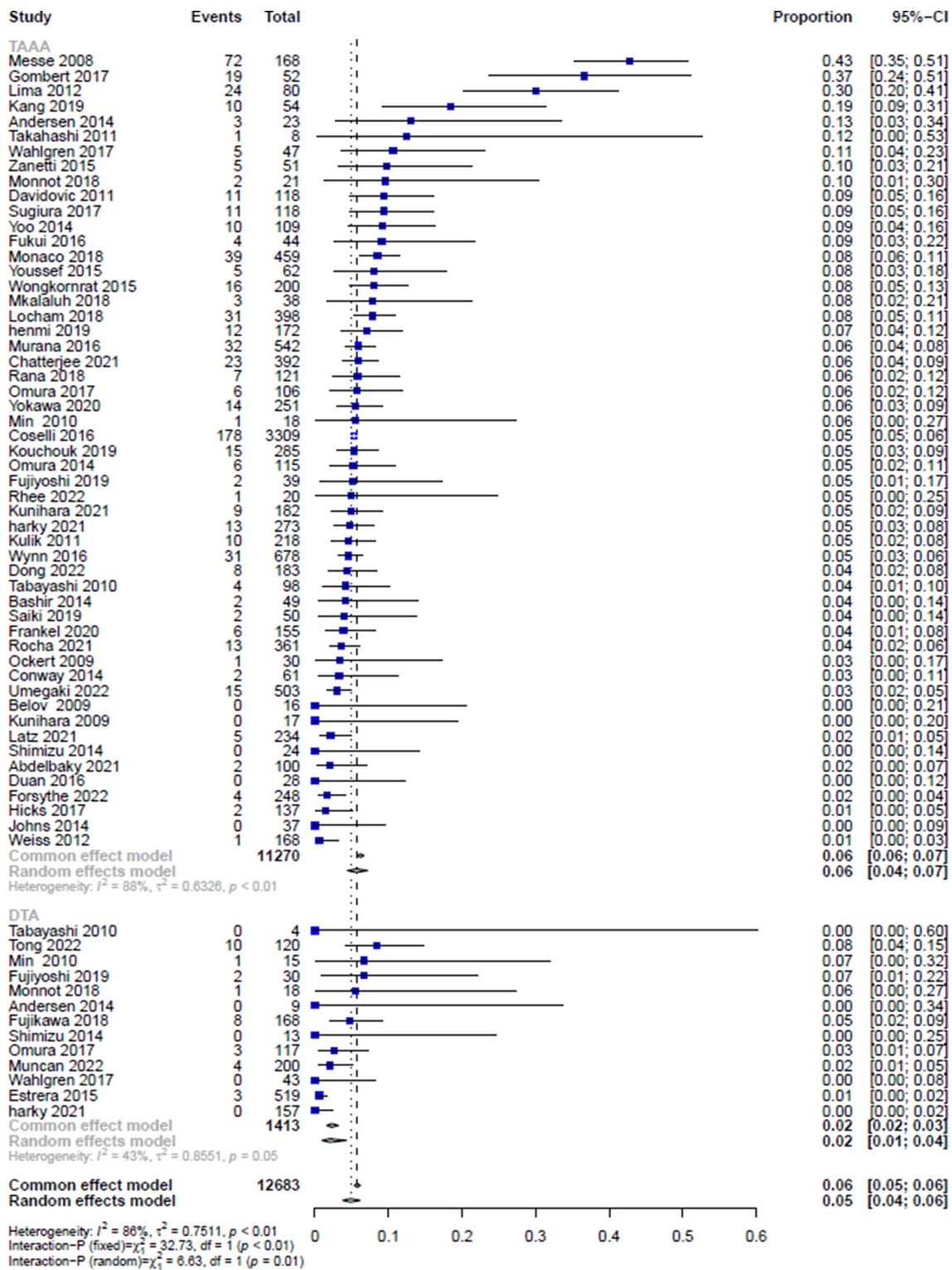


Figure S7 Sub-group analysis of permanent spinal cord injury after open repair of TAAA vs. DTA. CI, confidence interval; TAAA, thoracoabdominal aortic aneurysm; DTA, descending thoracic aneurysm.

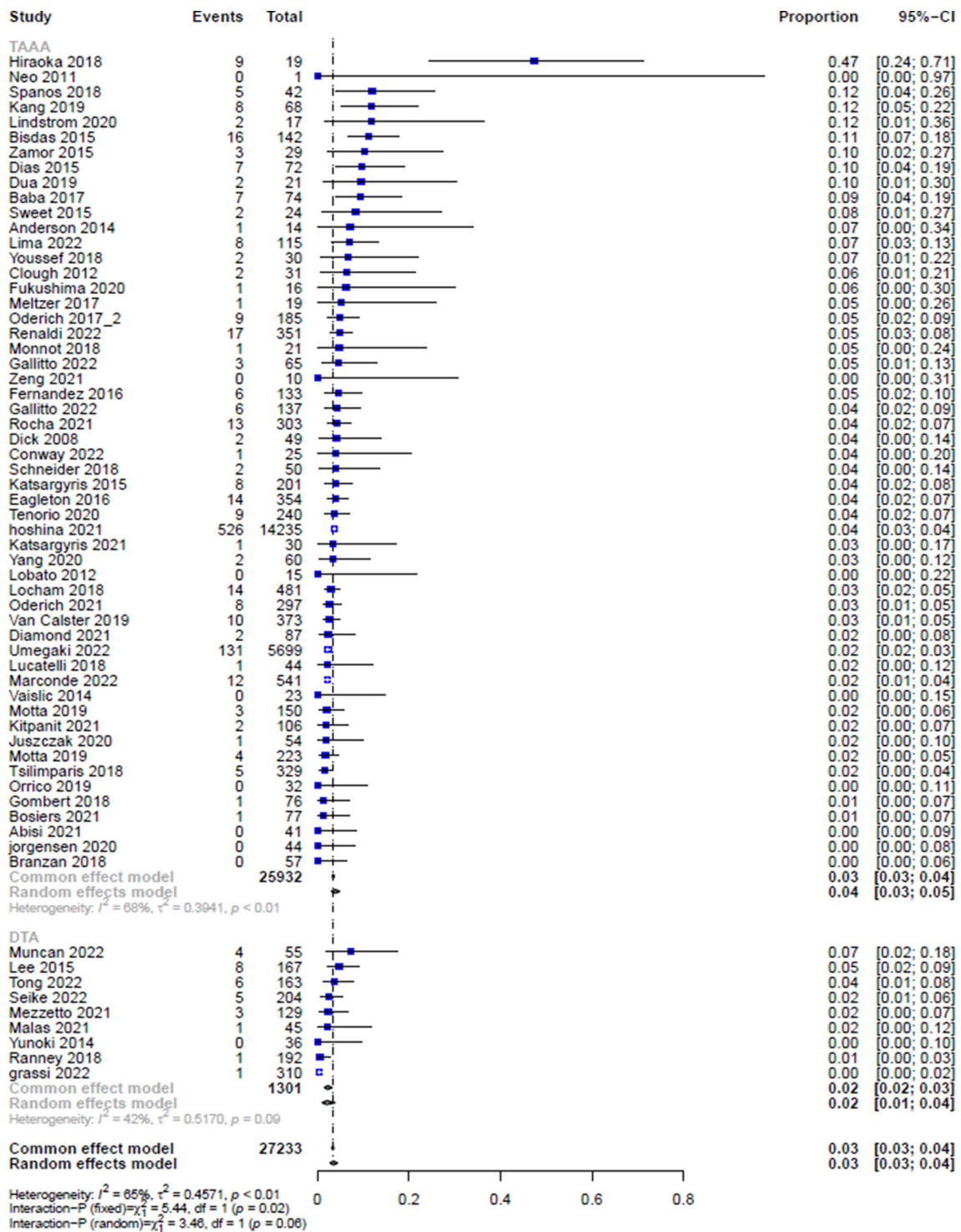
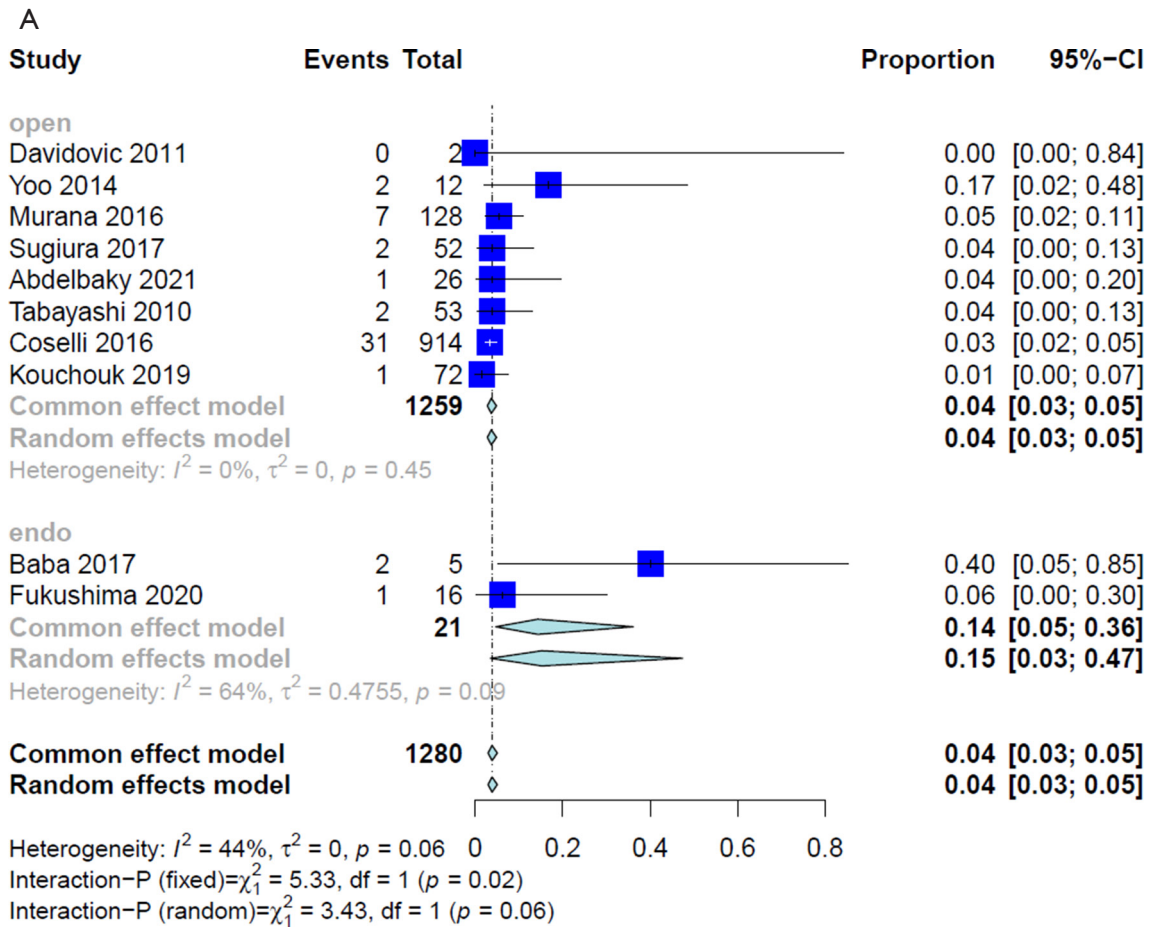
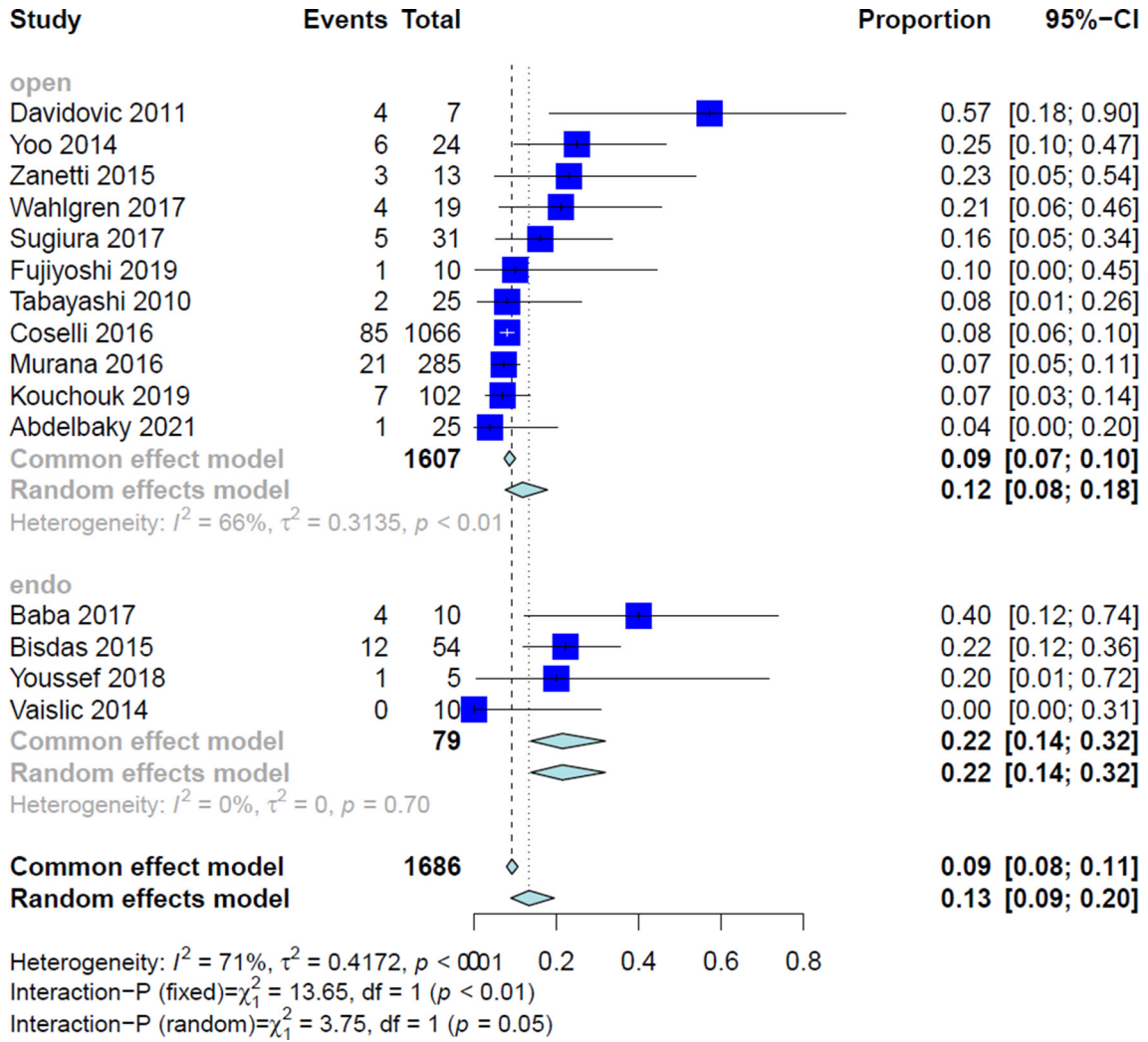


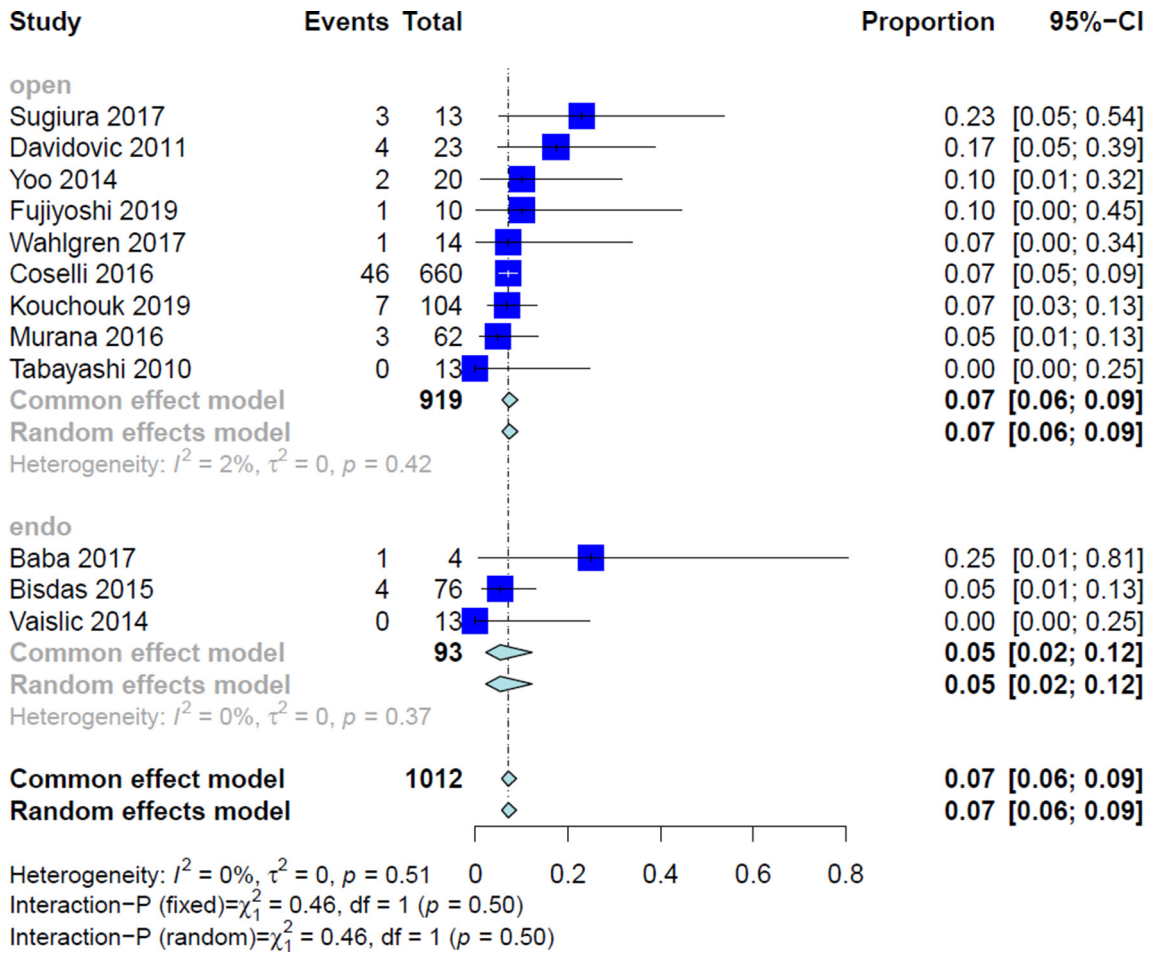
Figure S8 Sub-group analysis of permanent spinal cord injury after endovascular repair of TAAA vs. DTA. CI, confidence interval; TAAA, thoracoabdominal aortic aneurysm; DTA, descending thoracic aneurysm.



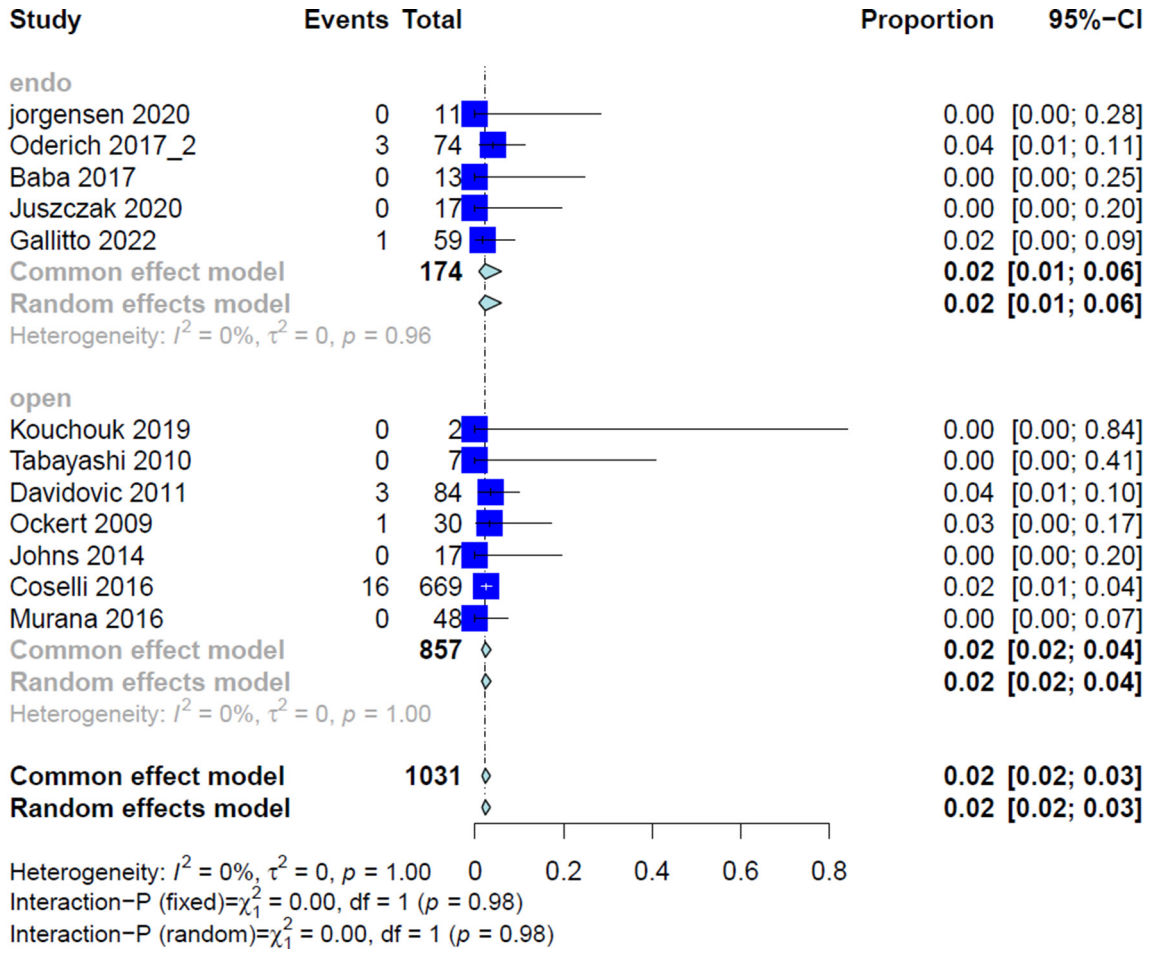
B



C



D



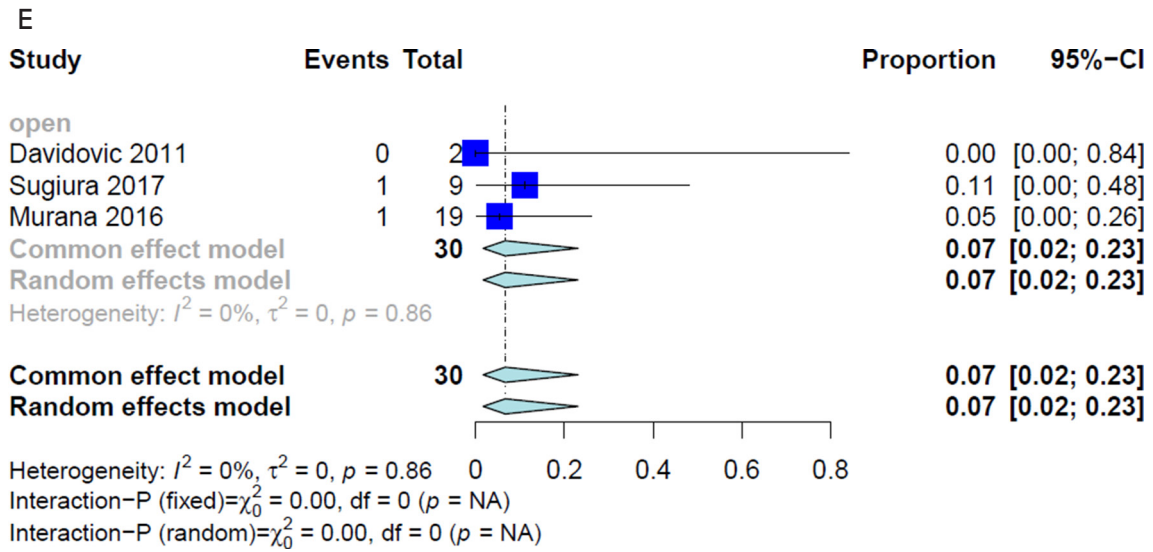


Figure S9 Sub-group analysis of permanent spinal cord injury after repair of Crawford Extent I, II, III, IV, V aneurysms. (A) Sub-group analysis of permanent spinal cord injury after repair of Crawford Extent I aneurysms. (B) Sub-group analysis of permanent spinal cord injury after repair of Crawford Extent II aneurysms. (C) Sub-group analysis of permanent spinal cord injury after repair of Crawford Extent III aneurysms. (D) Sub-group analysis of permanent spinal cord injury after repair of Crawford Extent IV aneurysms. (E) Sub-group analysis of permanent spinal cord injury after repair of Crawford Extent V aneurysms. CI, confidence interval.

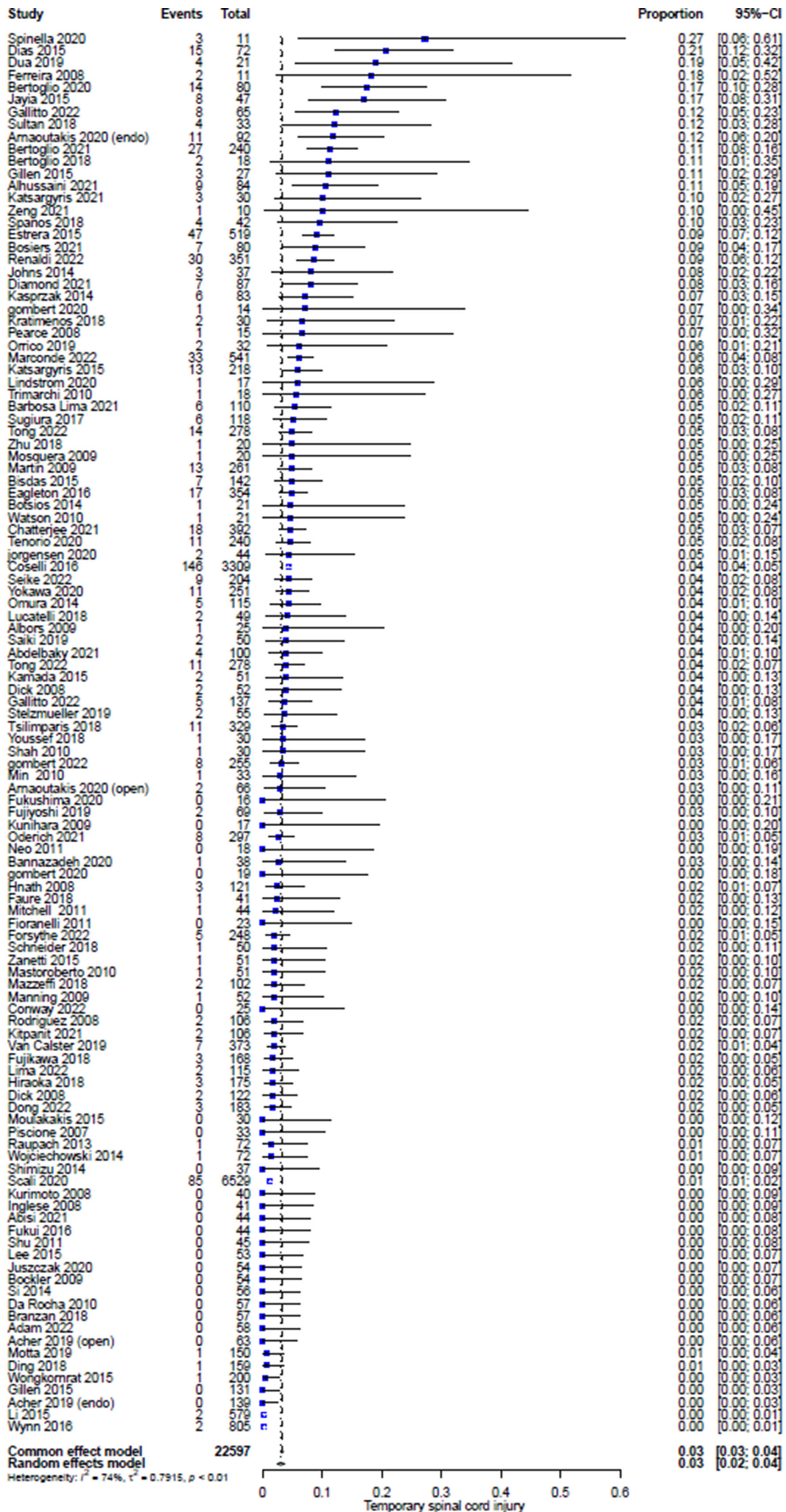
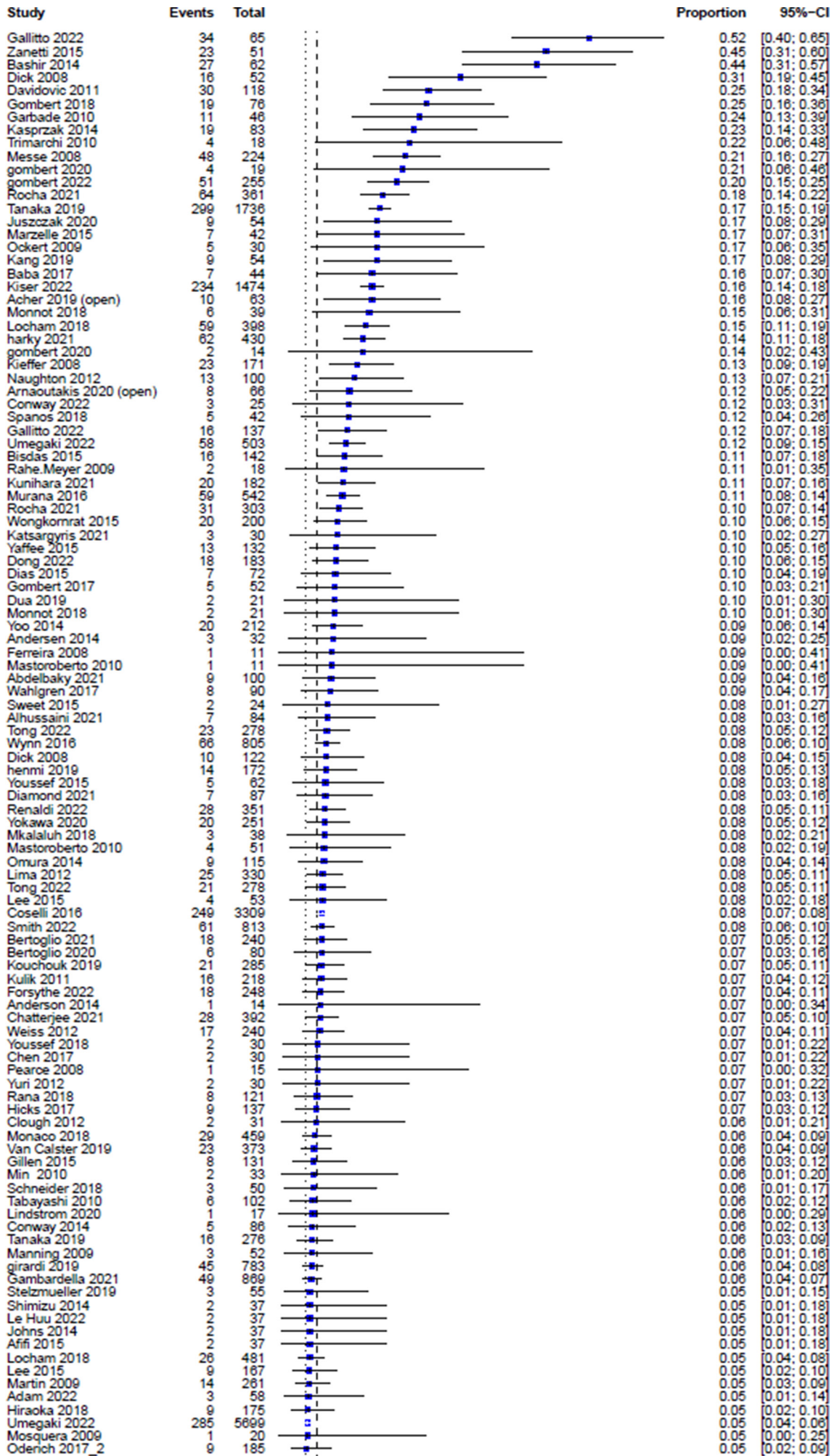


Figure S10 Forest plot for pooled rate of temporary spinal cord injury. CI, confidence interval.



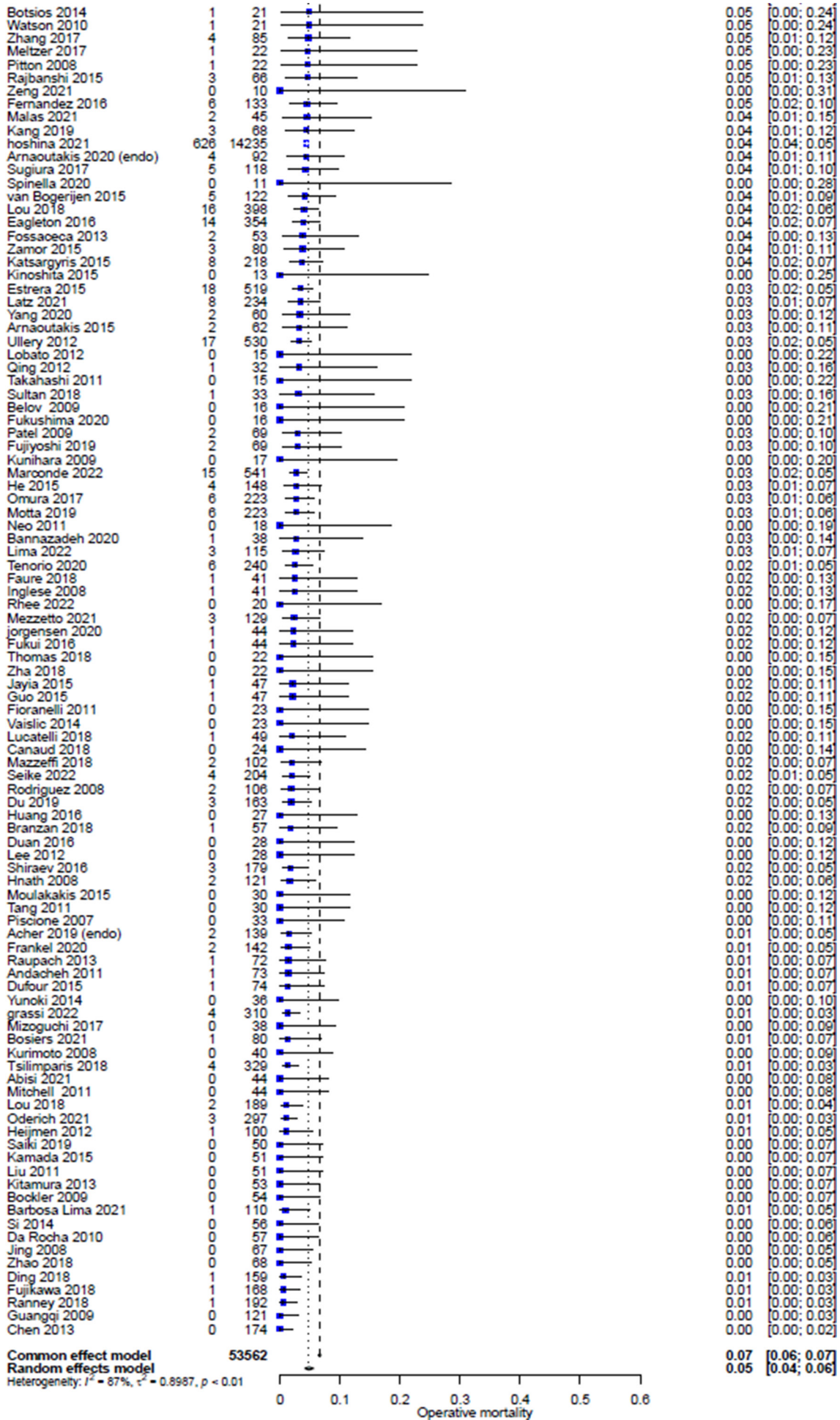
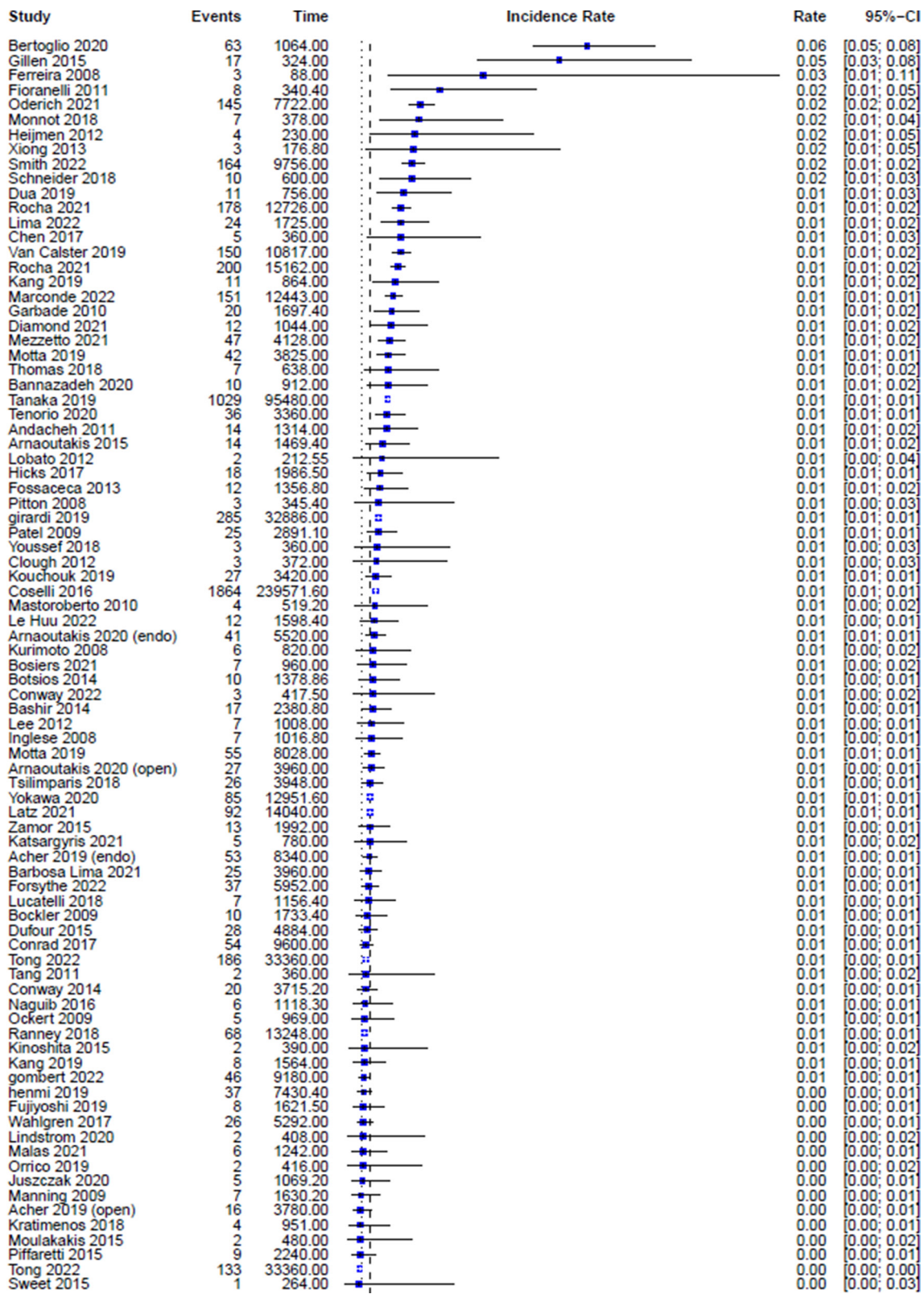


Figure S11 Forest plot for pooled incidence rate of 30-day/in-hospital mortality. CI, confidence interval.



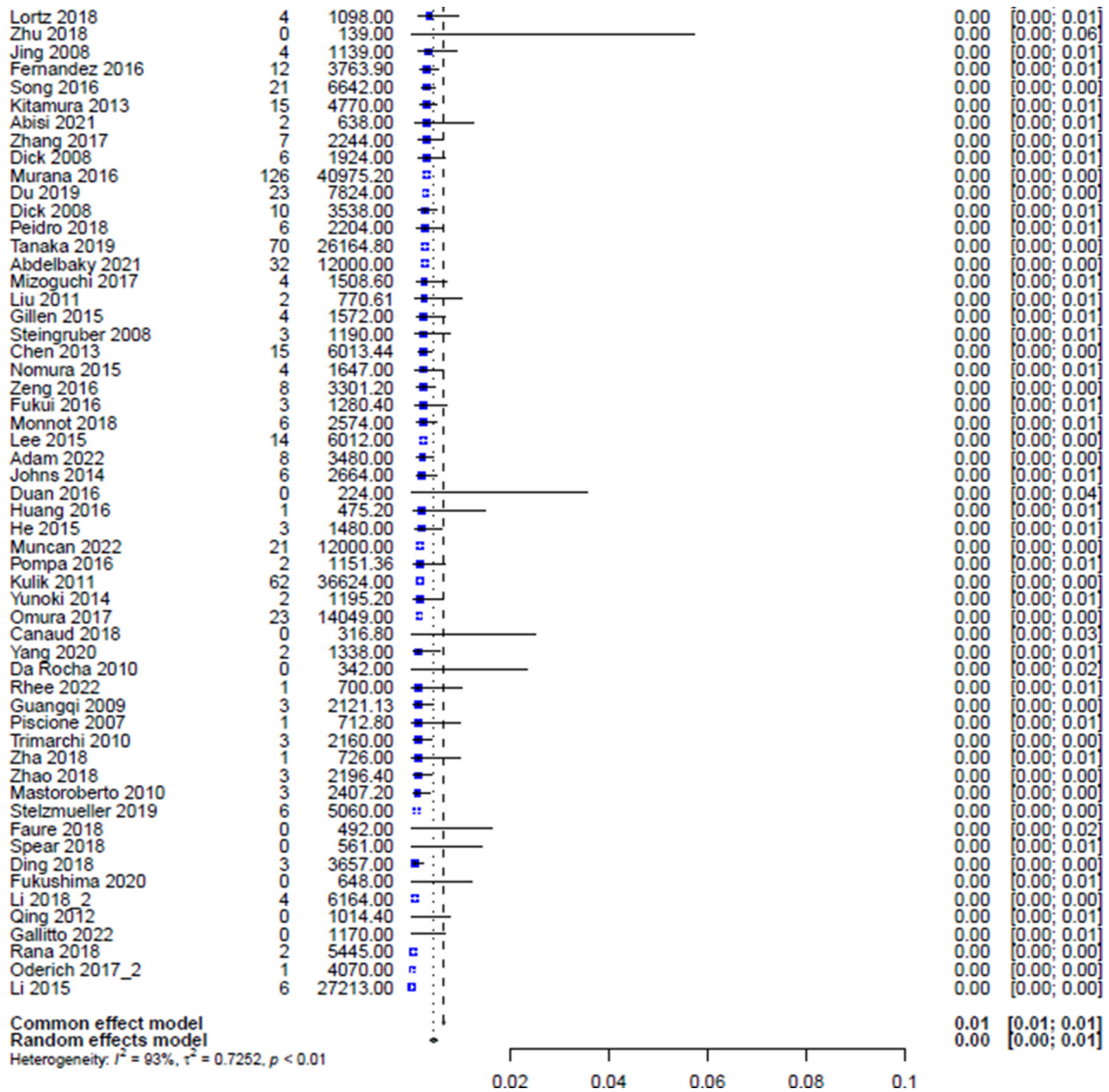
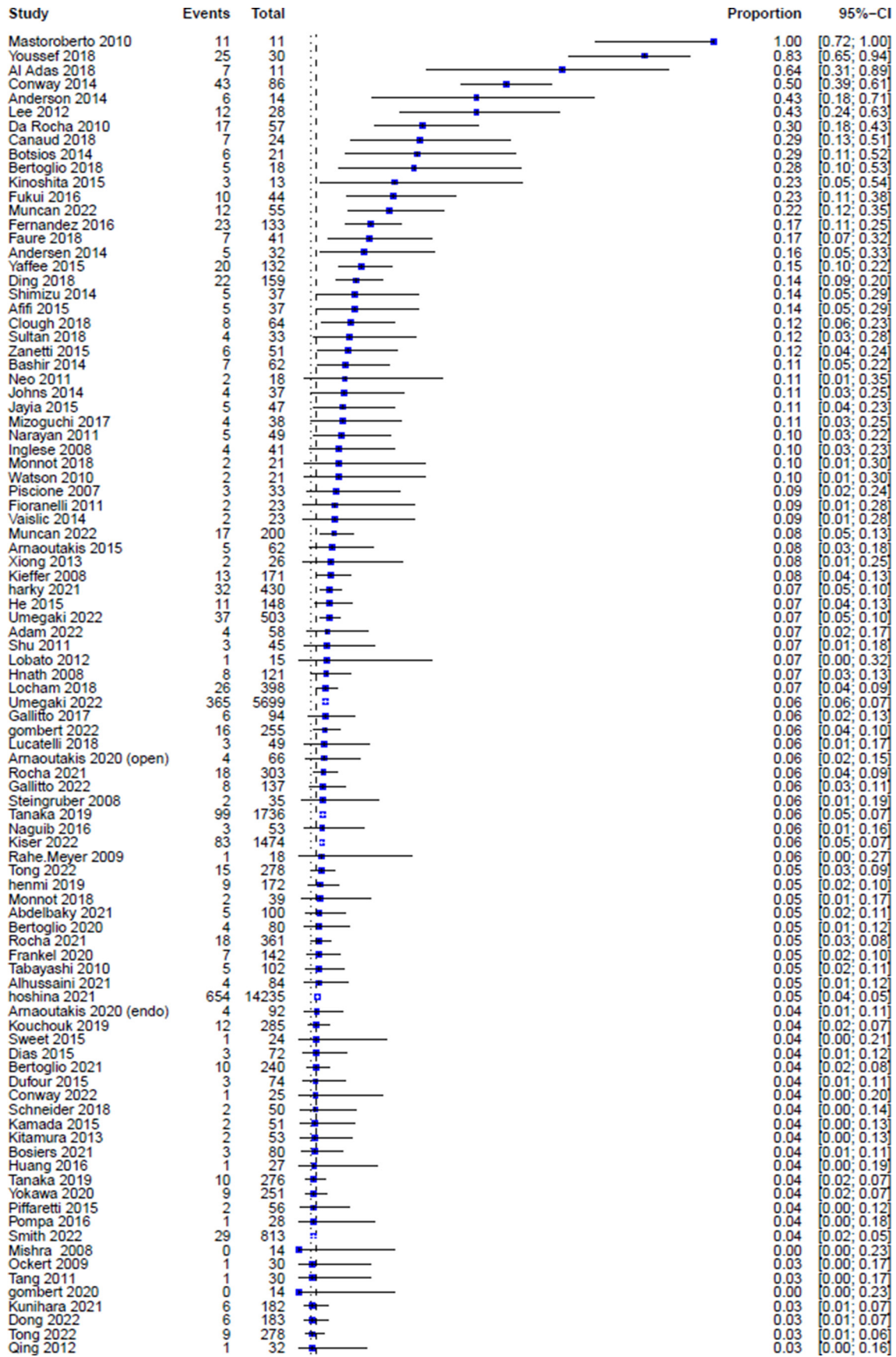


Figure S12 Forest plot for pooled incidence rate of follow-up mortality. CI, confidence interval.



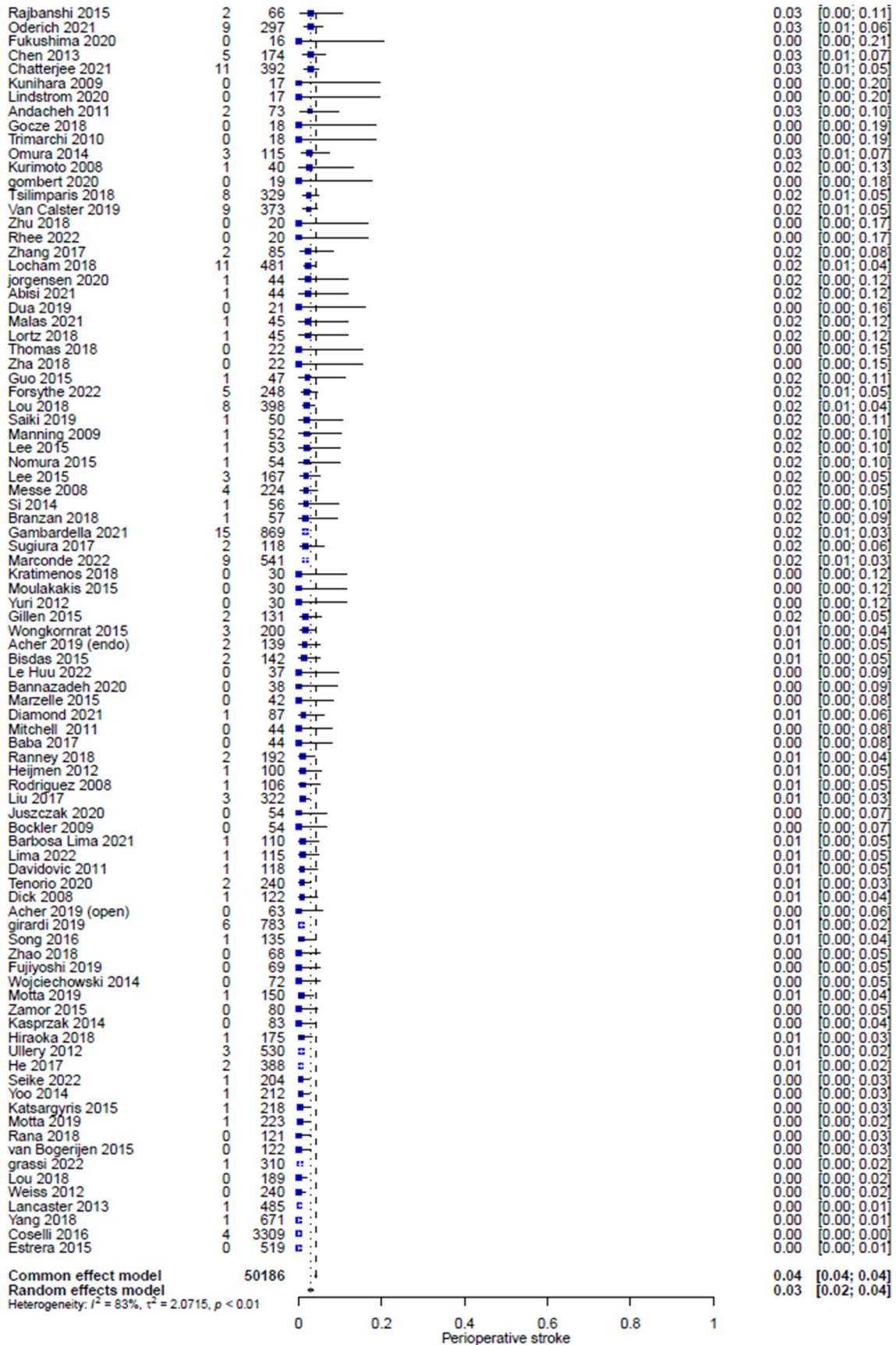
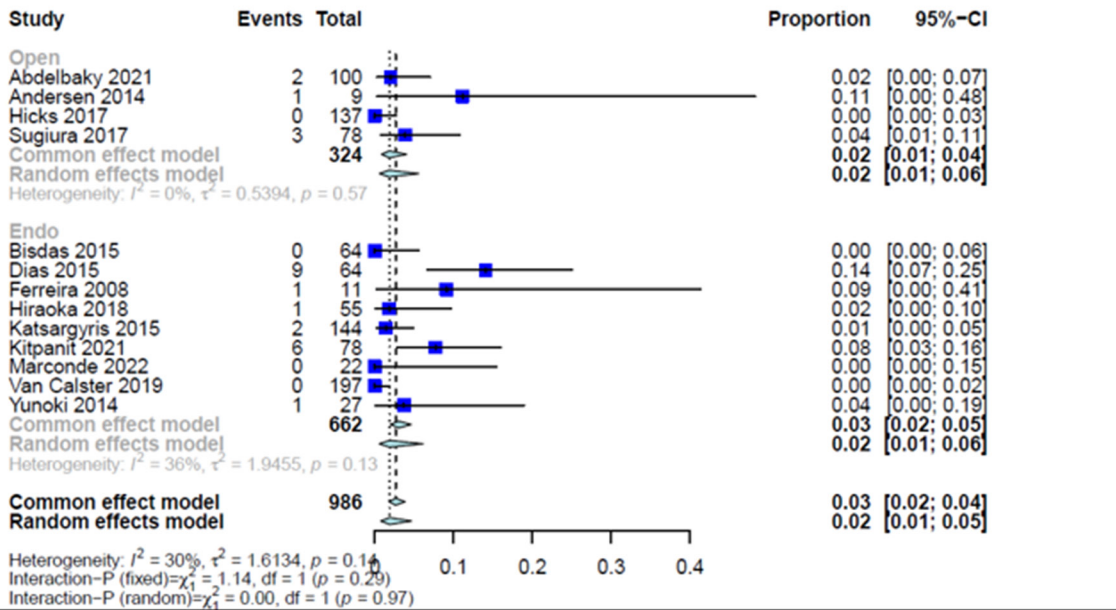
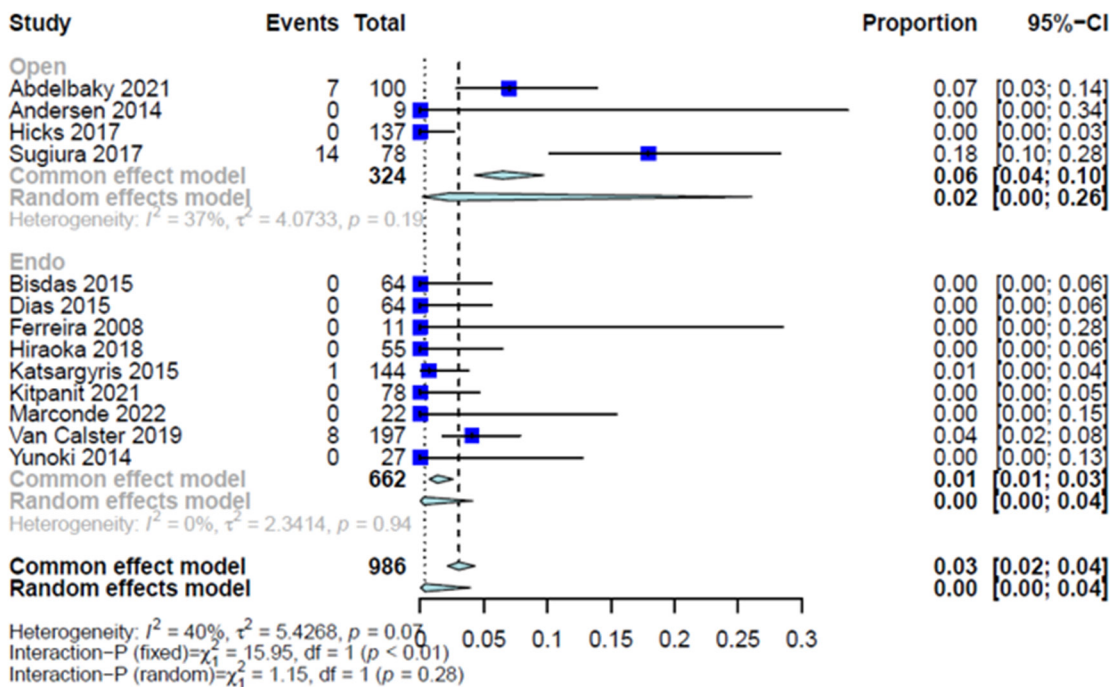


Figure S13 Forest plot for pooled rate of post-operative stroke. CI, confidence interval.

A Severe



B Moderate



C Minor

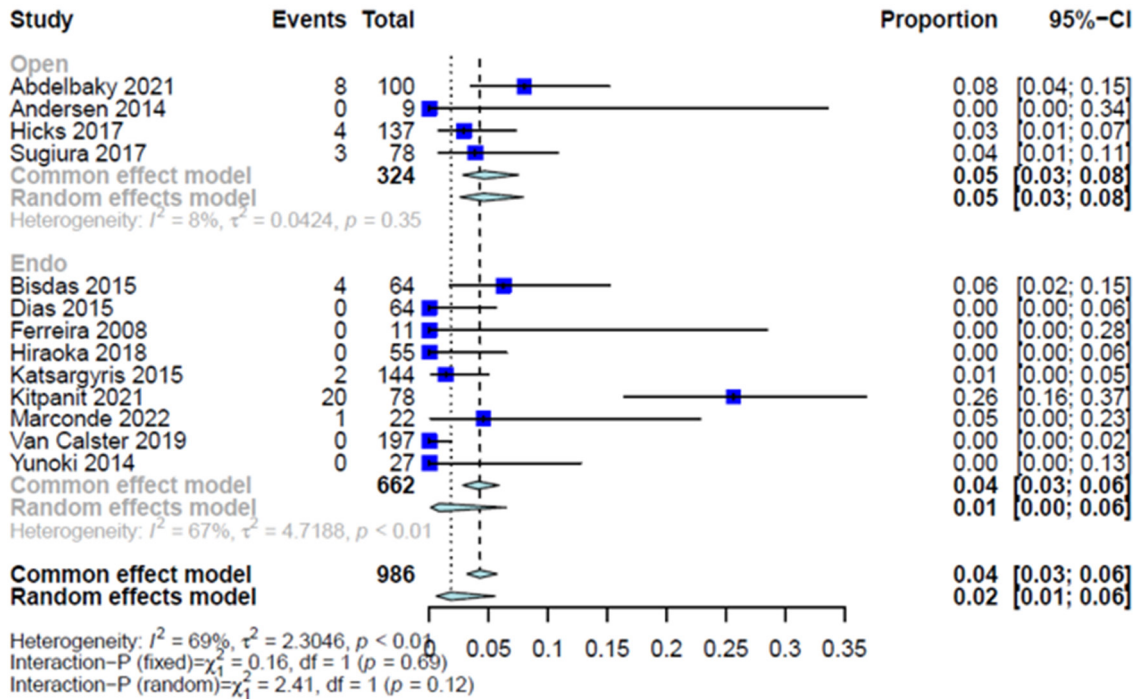


Figure S14 Forest plots of pooled complication rates related to CSF drain use. (A) Severe complications. (B) Moderate complications. (C) Minor complications. CI, confidence interval; CSF, cerebrospinal fluid.

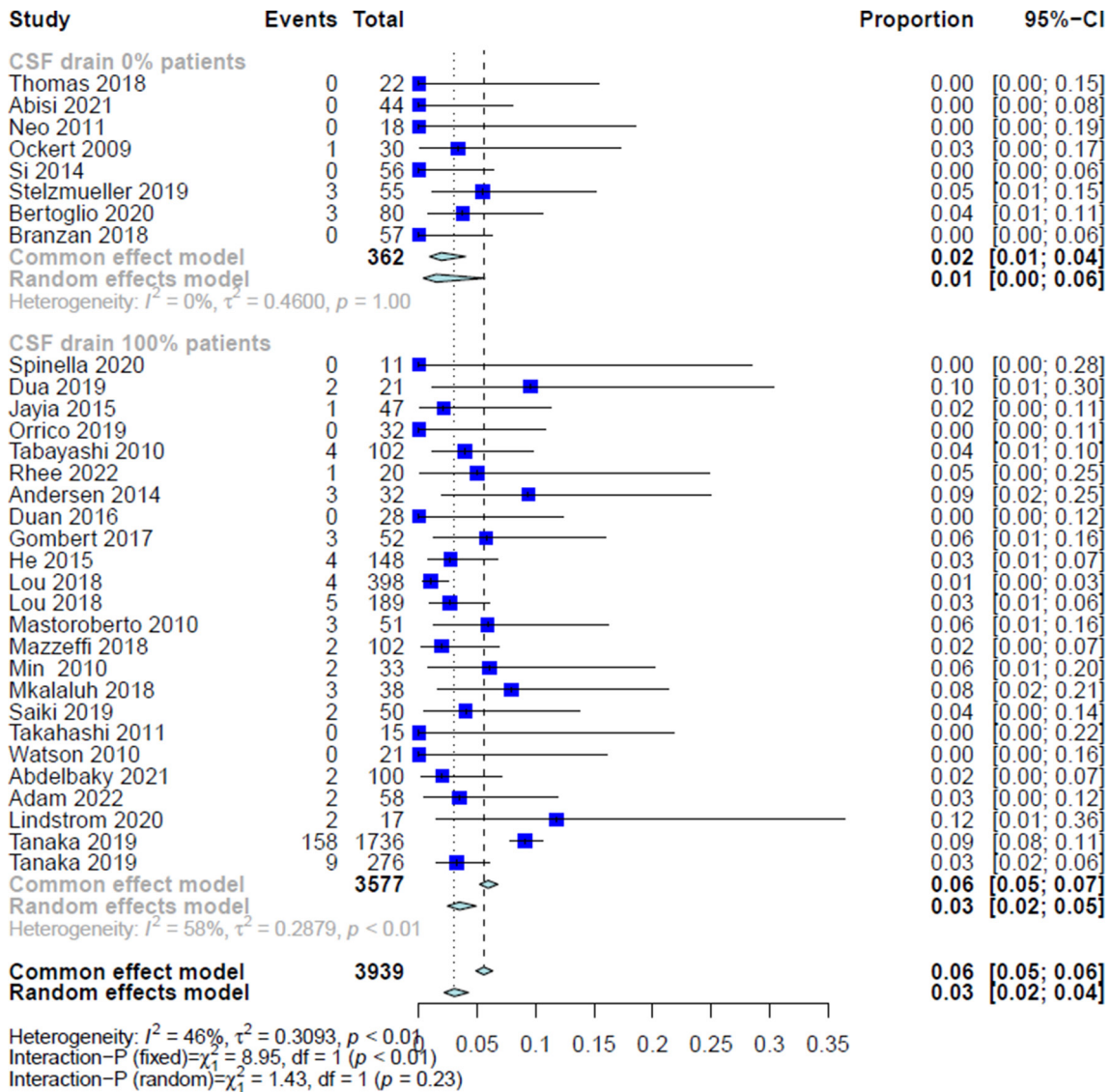
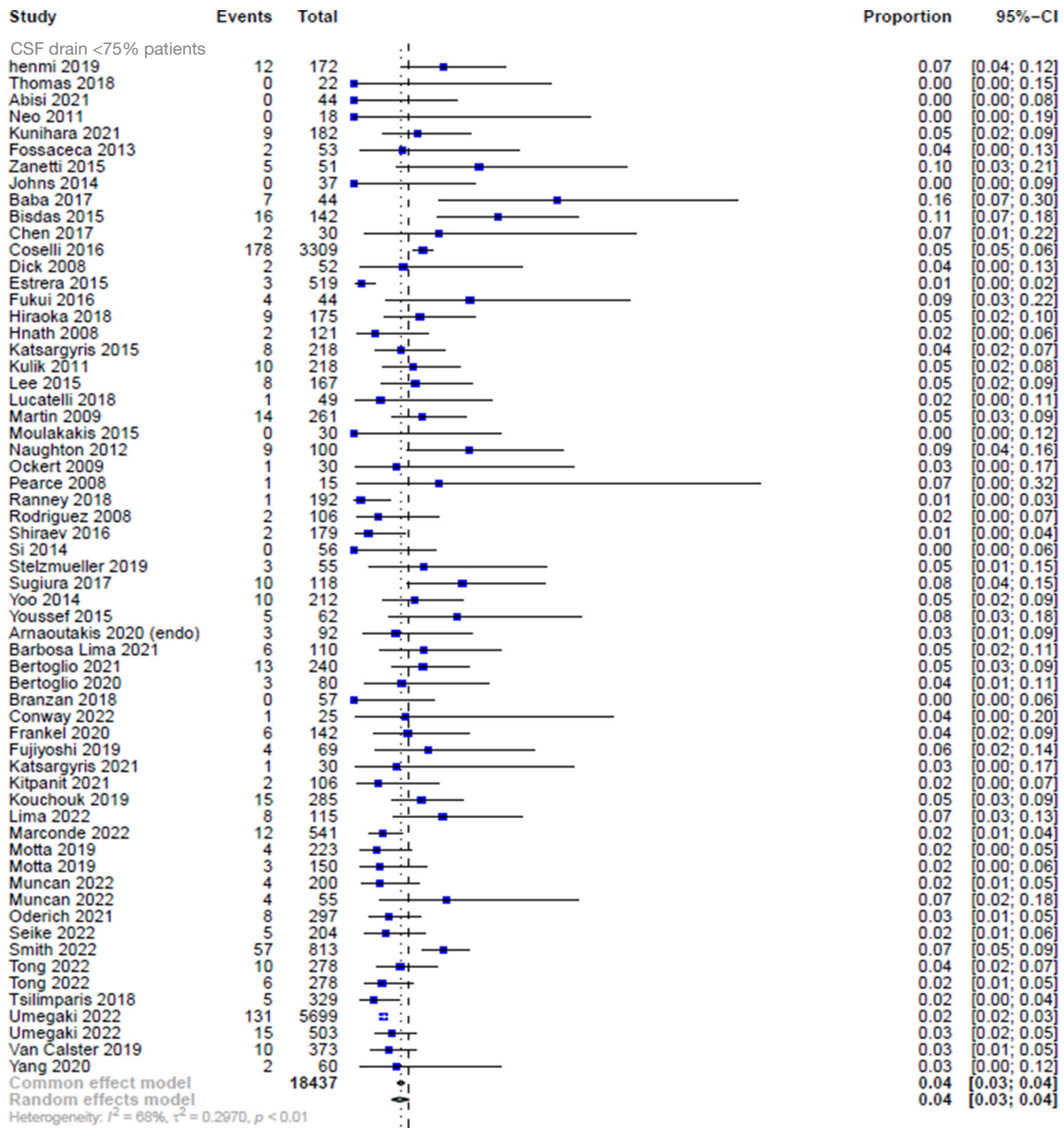


Figure S15 Sub-group analysis of permanent spinal cord injury of studies reporting median CSF drain use in 0% patient's vs. 100% patients. CI, confidence interval; CSF, cerebrospinal fluid.



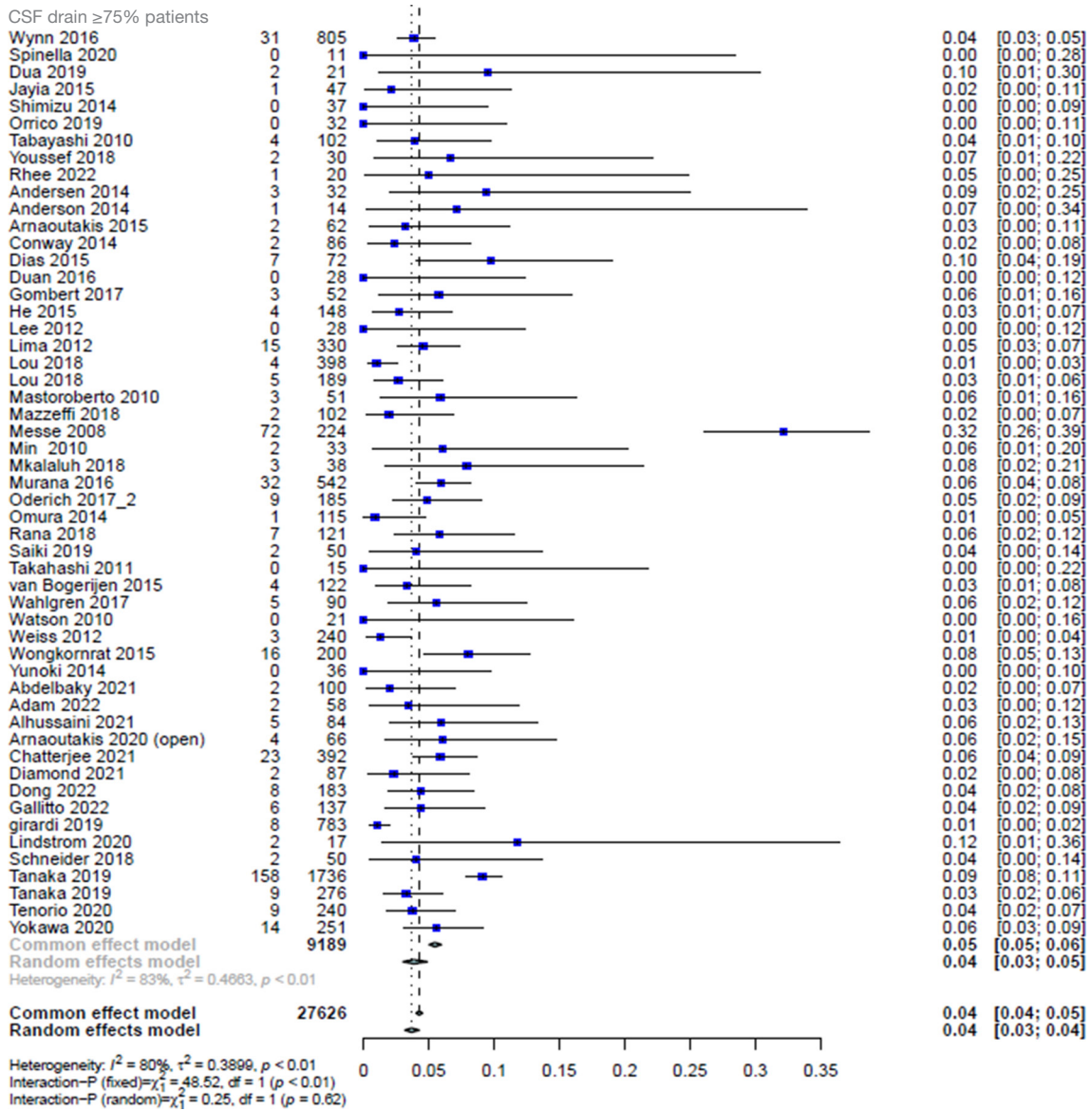
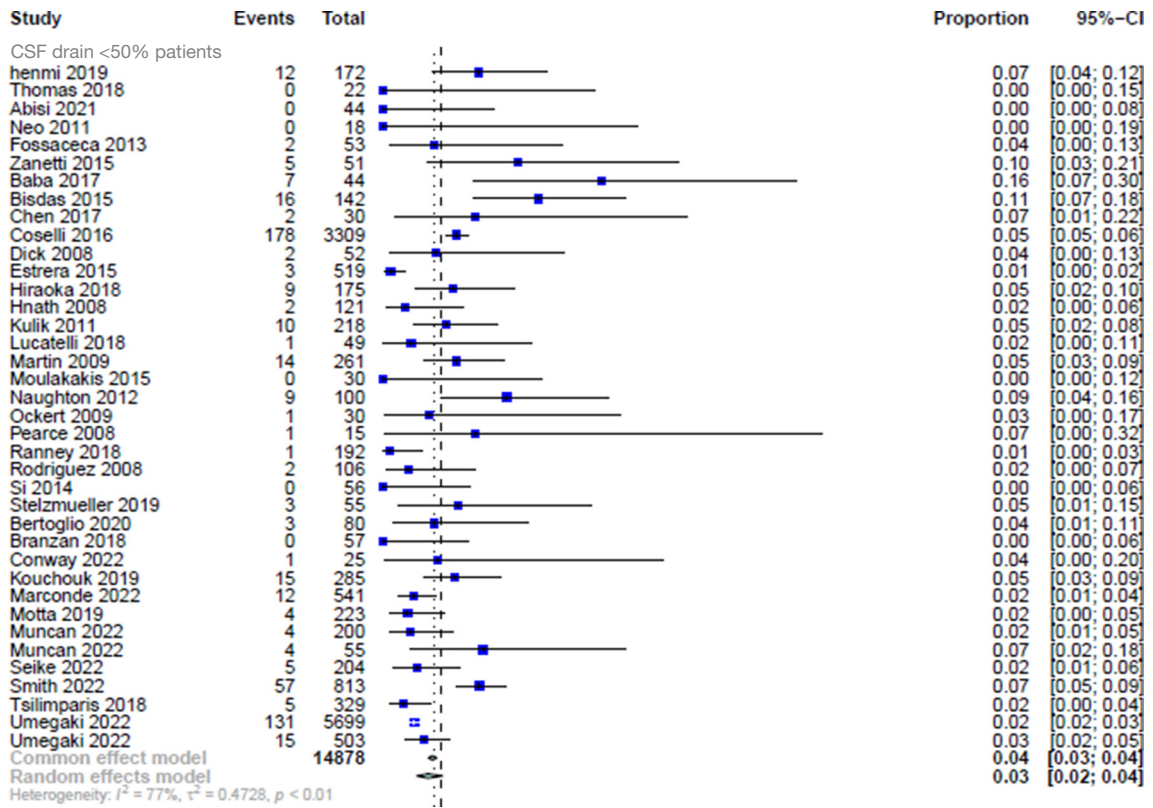


Figure S16 Sub-group analysis of permanent spinal cord injury of studies reporting median CSF drain use in <75% patients vs. $\geq 75\%$ patients. CI, confidence interval; CSF, cerebrospinal fluid.



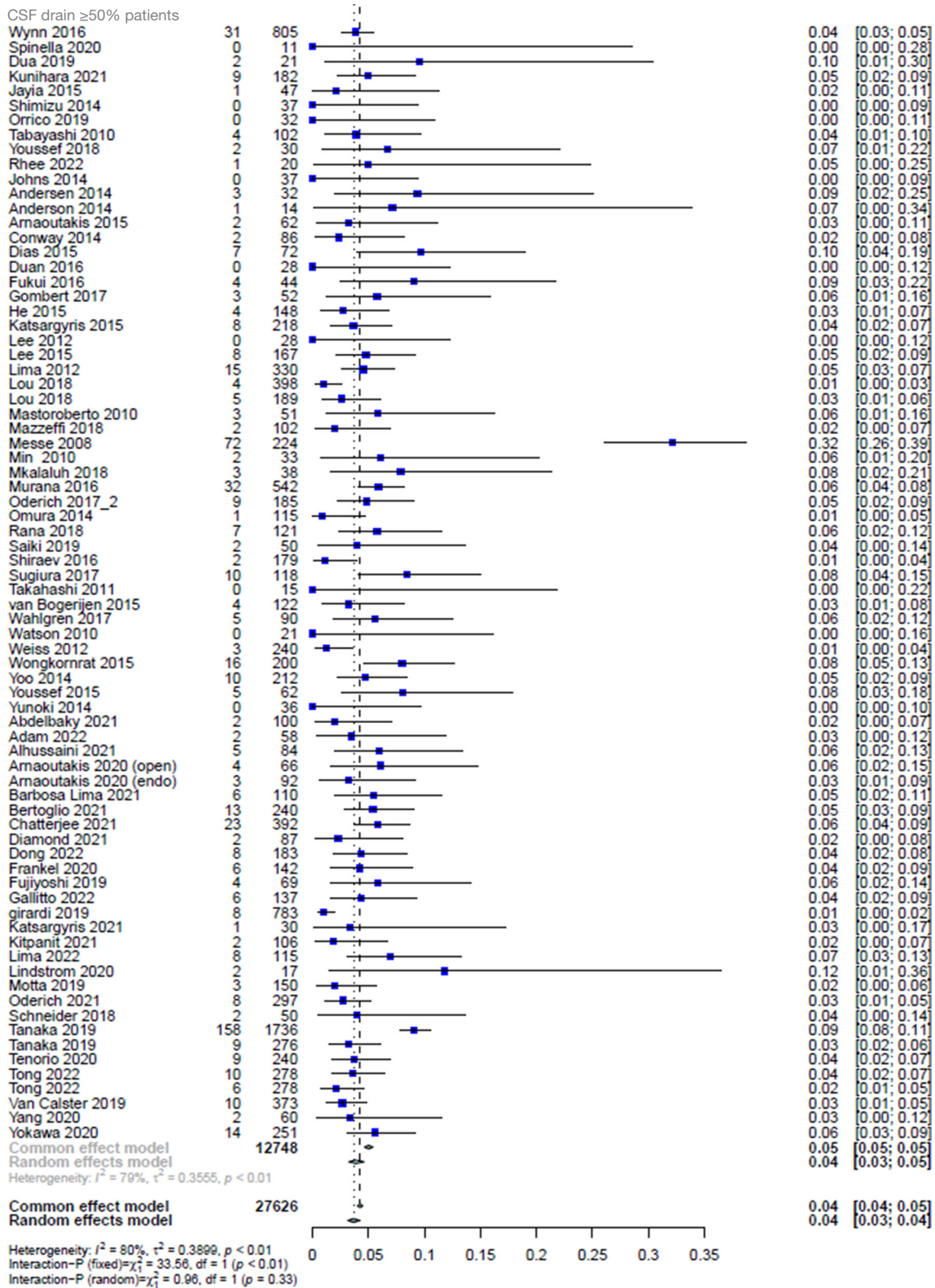


Figure S17 Sub-group analysis of permanent spinal cord injury of studies reporting median CSF drain use in <50% patients vs. $\geq 50\%$ patients. CI, confidence interval; CSF, cerebrospinal fluid.

Study	Proportion	95%-CI	P-value	Tau2	Tau	I2
Omitting henmi 2019	0.03	0.03; 0.04	.	0.6105	0.7813	81%
Omitting hoshina 2021	0.03	0.03; 0.04	.	0.6147	0.7840	80%
Omitting jorgensen 2020	0.03	0.03; 0.04	.	0.6033	0.7767	81%
Omitting Juszczak 2020	0.03	0.03; 0.04	.	0.6081	0.7798	81%
Omitting Wynn 2016	0.03	0.03; 0.04	.	0.6143	0.7838	81%
Omitting Kurimoto 2008	0.03	0.03; 0.04	.	0.6038	0.7770	81%
Omitting Thomas 2018	0.03	0.03; 0.04	.	0.6059	0.7784	81%
Omitting grassi 2022	0.03	0.03; 0.04	.	0.5862	0.7656	81%
Omitting Abisi 2021	0.03	0.03; 0.04	.	0.6033	0.7767	81%
Omitting Neo 2011	0.03	0.03; 0.04	.	0.6063	0.7787	81%
Omitting Sweet 2015	0.03	0.03; 0.04	.	0.6095	0.7807	81%
Omitting Mitchell 2011	0.03	0.03; 0.04	.	0.6033	0.7767	81%
Omitting Raupach 2013	0.03	0.03; 0.04	.	0.6065	0.7788	81%
Omitting Spinella 2020	0.03	0.03; 0.04	.	0.6069	0.7790	81%
Omitting Dua 2019	0.03	0.03; 0.04	.	0.6089	0.7803	81%
Omitting Malas 2021	0.03	0.03; 0.04	.	0.6087	0.7802	81%
Omitting Clough 2012	0.03	0.03; 0.04	.	0.6085	0.7801	81%
Omitting Kunihara 2021	0.03	0.03; 0.04	.	0.6130	0.7830	81%
Omitting Fossaceca 2013	0.03	0.03; 0.04	.	0.6109	0.7816	81%
Omitting Zanetti 2015	0.03	0.03; 0.04	.	0.6074	0.7794	81%
Omitting Bockler 2009	0.03	0.03; 0.04	.	0.6021	0.7759	81%
Omitting Jayia 2015	0.03	0.03; 0.04	.	0.6086	0.7801	81%
Omitting Shimizu 2014	0.03	0.03; 0.04	.	0.6041	0.7773	81%
Omitting Orrico 2019	0.03	0.03; 0.04	.	0.6048	0.7777	81%
Omitting Tabayashi 2010	0.03	0.03; 0.04	.	0.6122	0.7825	81%
Omitting Da Rocha 2010	0.03	0.03; 0.04	.	0.6017	0.7757	81%
Omitting Youssef 2018	0.03	0.03; 0.04	.	0.6103	0.7812	81%
Omitting Zha 2018	0.03	0.03; 0.04	.	0.6059	0.7784	81%
Omitting Le Huu 2022	0.03	0.03; 0.04	.	0.6097	0.7808	81%
Omitting Rhee 2022	0.03	0.03; 0.04	.	0.6095	0.7807	81%
Omitting Johns 2014	0.03	0.03; 0.04	.	0.6041	0.7773	81%
Omitting Afifi 2015	0.03	0.03; 0.04	.	0.6107	0.7815	81%
Omitting Andacheh 2011	0.03	0.03; 0.04	.	0.6064	0.7787	81%
Omitting Andersen 2014	0.03	0.03; 0.04	.	0.6088	0.7802	81%
Omitting Anderson 2014	0.03	0.03; 0.04	.	0.6091	0.7805	81%
Omitting Arnaoutakis 2015	0.03	0.03; 0.04	.	0.6106	0.7814	81%
Omitting Baba 2017	0.03	0.03; 0.04	.	0.5975	0.7730	81%
Omitting Bashir 2014	0.03	0.03; 0.04	.	0.6106	0.7814	81%
Omitting Bisdas 2015	0.03	0.03; 0.04	.	0.6013	0.7755	81%
Omitting Botsios 2014	0.03	0.03; 0.04	.	0.6096	0.7808	81%
Omitting Canaud 2018	0.03	0.03; 0.04	.	0.6057	0.7783	81%
Omitting Chen 2013	0.03	0.03; 0.04	.	0.5888	0.7673	81%
Omitting Chen 2017	0.03	0.03; 0.04	.	0.6103	0.7812	81%
Omitting Conway 2014	0.03	0.03; 0.04	.	0.6094	0.7806	81%
Omitting Coselli 2016	0.03	0.03; 0.04	.	0.6130	0.7830	81%
Omitting Davidovic 2011	0.03	0.03; 0.04	.	0.6063	0.7787	81%
Omitting Dias 2015	0.03	0.03; 0.04	.	0.6067	0.7789	81%
Omitting Dick 2008	0.03	0.03; 0.04	.	0.6109	0.7816	81%
Omitting Dick 2008	0.03	0.03; 0.04	.	0.6069	0.7790	81%
Omitting Ding 2018	0.03	0.03; 0.04	.	0.5984	0.7736	81%
Omitting Du 2019	0.03	0.03; 0.04	.	0.6078	0.7796	81%
Omitting Duan 2016	0.03	0.03; 0.04	.	0.6052	0.7780	81%
Omitting Dufour 2015	0.03	0.03; 0.04	.	0.6063	0.7787	81%
Omitting Eagleton 2016	0.03	0.03; 0.04	.	0.6139	0.7835	81%
Omitting Estreza 2015	0.03	0.03; 0.04	.	0.5868	0.7660	81%
Omitting Faure 2018	0.03	0.03; 0.04	.	0.6090	0.7804	81%
Omitting Fernandez 2016	0.03	0.03; 0.04	.	0.6129	0.7829	81%
Omitting Ferreira 2008	0.03	0.03; 0.04	.	0.6087	0.7802	81%
Omitting Fioranelli 2011	0.03	0.03; 0.04	.	0.6058	0.7783	81%
Omitting Fujikawa 2018	0.03	0.03; 0.04	.	0.6131	0.7830	81%
Omitting Fukui 2016	0.03	0.03; 0.04	.	0.6087	0.7802	81%
Omitting Garbade 2010	0.03	0.03; 0.04	.	0.5796	0.7613	81%
Omitting Gillen 2015	0.03	0.03; 0.04	.	0.6096	0.7808	81%
Omitting Gombert 2017	0.03	0.03; 0.04	.	0.6113	0.7818	81%
Omitting Gombert 2018	0.03	0.03; 0.04	.	0.5769	0.7595	81%
Omitting Guangqi 2009	0.03	0.03; 0.04	.	0.5942	0.7709	81%
Omitting Guo 2015	0.03	0.03; 0.04	.	0.6086	0.7801	81%
Omitting He 2015	0.03	0.03; 0.04	.	0.6110	0.7817	81%
Omitting Heijmen 2012	0.03	0.03; 0.04	.	0.6039	0.7771	81%
Omitting Hicks 2017	0.03	0.03; 0.04	.	0.6058	0.7783	81%
Omitting Hiraoka 2018	0.03	0.03; 0.04	.	0.6129	0.7829	81%
Omitting Hnath 2008	0.03	0.03; 0.04	.	0.6070	0.7791	81%
Omitting Huang 2016	0.03	0.03; 0.04	.	0.6053	0.7780	81%
Omitting Inglese 2008	0.03	0.03; 0.04	.	0.6090	0.7804	81%
Omitting Jing 2008	0.03	0.03; 0.04	.	0.6004	0.7749	81%

Omitting Kamada 2015	0.03	[0.03; 0.04]	0.6024	0.7762	81%
Omitting Kasprzak 2014	0.03	[0.03; 0.04]	0.5746	0.7580	80%
Omitting Katsargyris 2015	0.03	[0.03; 0.04]	0.6132	0.7831	81%
Omitting Kieffer 2008	0.03	[0.03; 0.04]	0.6131	0.7830	81%
Omitting Kinoshita 2015	0.03	[0.03; 0.04]	0.6067	0.7789	81%
Omitting Kitamura 2013	0.03	[0.03; 0.04]	0.6022	0.7760	81%
Omitting Kulik 2011	0.03	[0.03; 0.04]	0.6134	0.7832	81%
Omitting Kunihara 2009	0.03	[0.03; 0.04]	0.6064	0.7787	81%
Omitting Lee 2012	0.03	[0.03; 0.04]	0.6052	0.7780	81%
Omitting Lee 2015	0.03	[0.03; 0.04]	0.6130	0.7830	81%
Omitting Lee 2015	0.03	[0.03; 0.04]	0.6101	0.7811	81%
Omitting Lima 2012	0.03	[0.03; 0.04]	0.6137	0.7834	81%
Omitting Liu 2011	0.03	[0.03; 0.04]	0.6024	0.7762	81%
Omitting Lobato 2012	0.03	[0.03; 0.04]	0.6066	0.7788	81%
Omitting Lou 2018	0.03	[0.03; 0.04]	0.5980	0.7733	81%
Omitting Lou 2018	0.03	[0.03; 0.04]	0.6112	0.7818	81%
Omitting Lucatelli 2018	0.03	[0.03; 0.04]	0.6084	0.7800	81%
Omitting Manning 2009	0.03	[0.03; 0.04]	0.6113	0.7818	81%
Omitting Martin 2009	0.03	[0.03; 0.04]	0.6129	0.7829	81%
Omitting Marzelle 2015	0.03	[0.03; 0.04]	0.5964	0.7723	81%
Omitting Mastoroberto 2010	0.03	[0.03; 0.04]	0.6112	0.7818	81%
Omitting Mastoroberto 2010	0.03	[0.03; 0.04]	0.6087	0.7802	81%
Omitting Mazzeffi 2018	0.03	[0.03; 0.04]	0.6083	0.7800	81%
Omitting Meltzer 2017	0.03	[0.03; 0.04]	0.6096	0.7808	81%
Omitting Messe 2008	0.03	[0.03; 0.04]	0.5404	0.7351	76%
Omitting Min 2010	0.03	[0.03; 0.04]	0.6105	0.7813	81%
Omitting Mizoguchi 2017	0.03	[0.03; 0.04]	0.6040	0.7772	81%
Omitting Mkalaluh 2018	0.03	[0.03; 0.04]	0.6099	0.7809	81%
Omitting Monaco 2018	0.03	[0.03; 0.04]	0.6064	0.7787	81%
Omitting Monnot 2018	0.03	[0.03; 0.04]	0.6100	0.7810	81%
Omitting Monnot 2018	0.03	[0.03; 0.04]	0.6089	0.7803	81%
Omitting Mosquera 2009	0.03	[0.03; 0.04]	0.6095	0.7807	81%
Omitting Moulakakis 2015	0.03	[0.03; 0.04]	0.6050	0.7778	81%
Omitting Murana 2016	0.03	[0.03; 0.04]	0.6121	0.7824	81%
Omitting Naughton 2012	0.03	[0.03; 0.04]	0.6073	0.7793	81%
Omitting Ockert 2009	0.03	[0.03; 0.04]	0.6095	0.7807	81%
Omitting Oderich 2017_2	0.03	[0.03; 0.04]	0.6131	0.7830	81%
Omitting Omura 2014	0.03	[0.03; 0.04]	0.6024	0.7762	81%
Omitting Omura 2017	0.03	[0.03; 0.04]	0.6125	0.7827	81%
Omitting Patel 2009	0.03	[0.03; 0.04]	0.6103	0.7812	81%
Omitting Pearce 2008	0.03	[0.03; 0.04]	0.6092	0.7805	81%
Omitting Piscione 2007	0.03	[0.03; 0.04]	0.6046	0.7776	81%
Omitting Pitton 2008	0.03	[0.03; 0.04]	0.6096	0.7808	81%
Omitting Qing 2012	0.03	[0.03; 0.04]	0.6095	0.7807	81%
Omitting Rahe.Meyer 2009	0.03	[0.03; 0.04]	0.6063	0.7787	81%
Omitting Rajbanshi 2015	0.03	[0.03; 0.04]	0.6080	0.7797	81%
Omitting Rana 2018	0.03	[0.03; 0.04]	0.6121	0.7824	81%
Omitting Ranney 2018	0.03	[0.03; 0.04]	0.5955	0.7717	81%
Omitting Rodriguez 2008	0.03	[0.03; 0.04]	0.6081	0.7798	81%
Omitting Saiki 2019	0.03	[0.03; 0.04]	0.6109	0.7816	81%
Omitting Shiraev 2016	0.03	[0.03; 0.04]	0.6026	0.7763	81%
Omitting Si 2014	0.03	[0.03; 0.04]	0.6018	0.7758	81%
Omitting Spanos 2018	0.03	[0.03; 0.04]	0.6049	0.7778	81%
Omitting Slezmueller 2019	0.03	[0.03; 0.04]	0.6114	0.7819	81%
Omitting Sugiura 2017	0.03	[0.03; 0.04]	0.6080	0.7798	81%
Omitting Sultan 2018	0.03	[0.03; 0.04]	0.6094	0.7807	81%
Omitting Takahashi 2011	0.03	[0.03; 0.04]	0.6066	0.7788	81%
Omitting Tang 2011	0.03	[0.03; 0.04]	0.6050	0.7778	81%
Omitting Trimarchi 2010	0.03	[0.03; 0.04]	0.6063	0.7787	81%
Omitting Ullery 2012	0.03	[0.03; 0.04]	0.6135	0.7833	81%
Omitting Vaislic 2014	0.03	[0.03; 0.04]	0.6058	0.7783	81%
Omitting van Bogerijen 2015	0.03	[0.03; 0.04]	0.6119	0.7822	81%
Omitting Wahlgren 2017	0.03	[0.03; 0.04]	0.6120	0.7823	81%
Omitting Watson 2010	0.03	[0.03; 0.04]	0.6060	0.7785	81%
Omitting Weiss 2012	0.03	[0.03; 0.04]	0.6029	0.7765	81%
Omitting Wongkomrat 2015	0.03	[0.03; 0.04]	0.6083	0.7799	81%
Omitting Yoo 2014	0.03	[0.03; 0.04]	0.6133	0.7831	81%
Omitting Youssef 2015	0.03	[0.03; 0.04]	0.6095	0.7807	81%
Omitting Yunoki 2014	0.03	[0.03; 0.04]	0.6043	0.7774	81%
Omitting Yun 2012	0.03	[0.03; 0.04]	0.6103	0.7812	81%
Omitting Zamor 2015	0.03	[0.03; 0.04]	0.6117	0.7821	81%
Omitting Zhang 2017	0.03	[0.03; 0.04]	0.6122	0.7824	81%
Omitting Zhao 2018	0.03	[0.03; 0.04]	0.6003	0.7748	81%
Omitting Abdelbaky 2021	0.03	[0.03; 0.04]	0.6085	0.7801	81%
Omitting Acher 2019 (open)	0.03	[0.03; 0.04]	0.6073	0.7793	81%
Omitting Acher 2019 (endo)	0.03	[0.03; 0.04]	0.5923	0.7696	81%
Omitting Adam 2022	0.03	[0.03; 0.04]	0.6108	0.7815	81%
Omitting Alhussaini 2021	0.03	[0.03; 0.04]	0.6117	0.7821	81%
Omitting Arnaoutakis 2020 (open)	0.03	[0.03; 0.04]	0.6114	0.7819	81%
Omitting Arnaoutakis 2020 (endo)	0.03	[0.03; 0.04]	0.6114	0.7819	81%

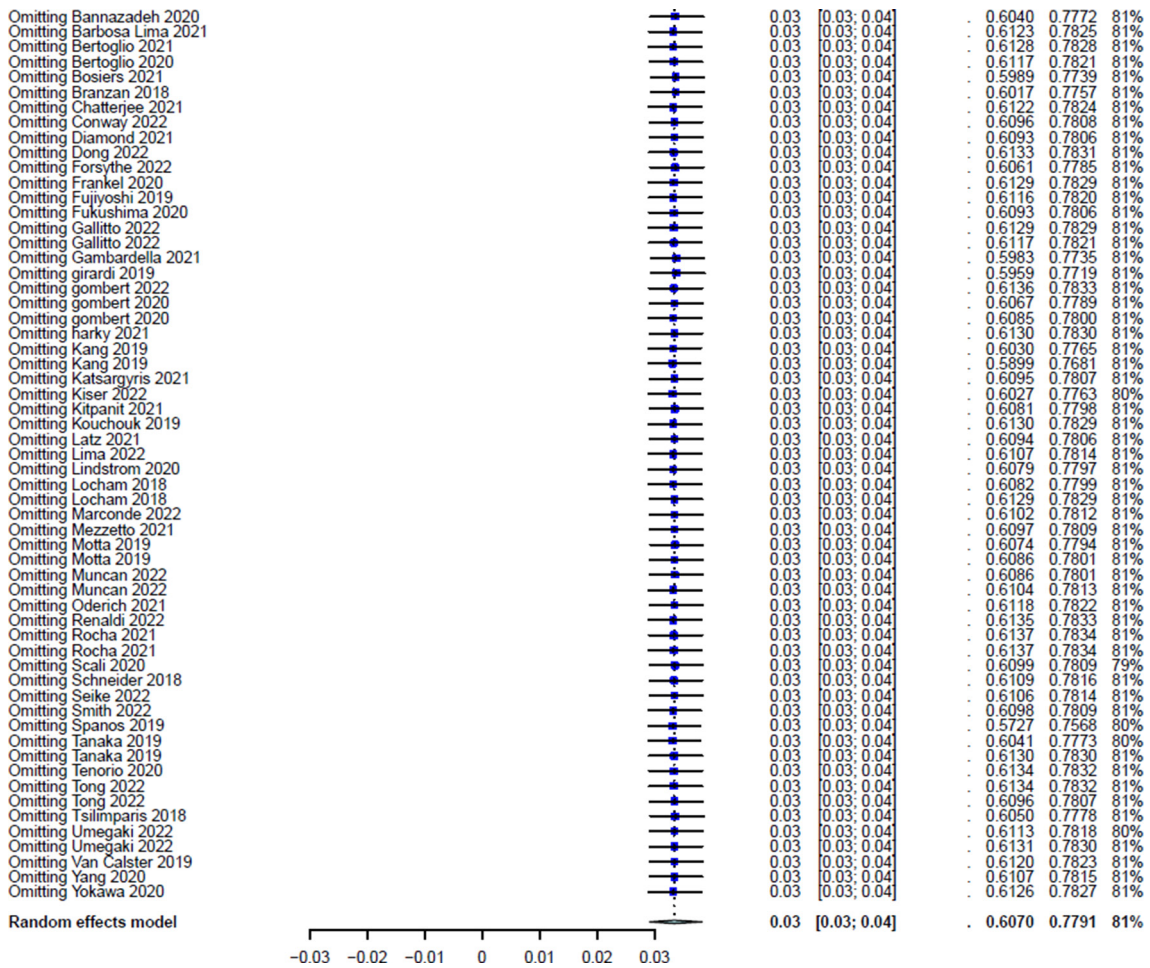
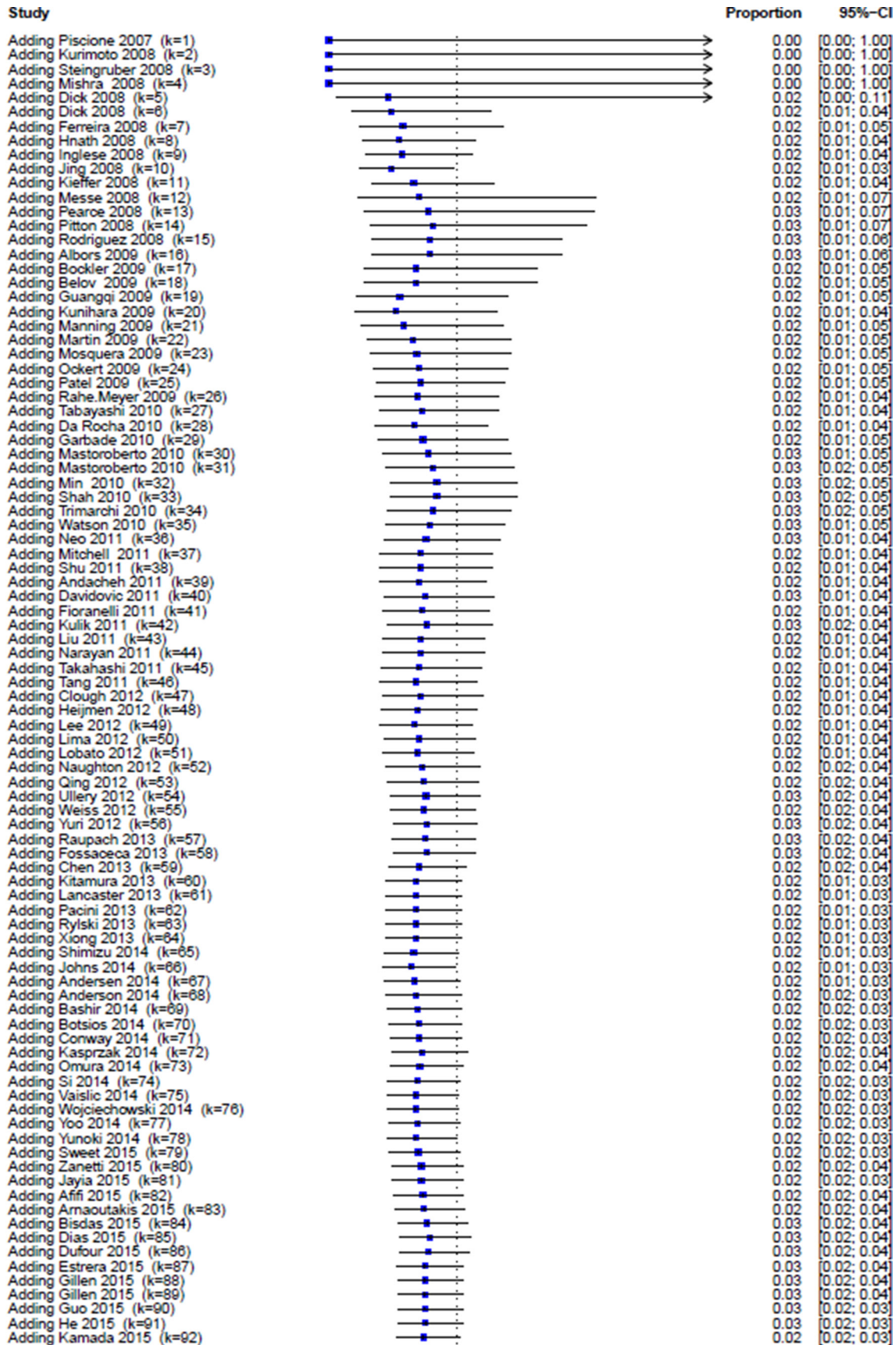


Figure S18 Leave one out analysis for the primary outcome of permanent spinal cord injury. CI, confidence interval.



Adding Katsargyns 2015 (k=93)		0.03	[0.02; 0.03]
Adding Kinoshita 2015 (k=94)		0.02	[0.02; 0.03]
Adding Lee 2015 (k=95)		0.03	[0.02; 0.03]
Adding Lee 2015 (k=96)		0.03	[0.02; 0.04]
Adding Li 2015 (k=97)		0.03	[0.02; 0.04]
Adding Marzelle 2015 (k=98)		0.03	[0.02; 0.04]
Adding Moulakakis 2015 (k=99)		0.03	[0.02; 0.04]
Adding Nomura 2015 (k=100)		0.03	[0.02; 0.04]
Adding Piffaretti 2015 (k=101)		0.03	[0.02; 0.04]
Adding Rajbanshi 2015 (k=102)		0.03	[0.02; 0.04]
Adding Rossi 2015 (k=103)		0.03	[0.02; 0.04]
Adding van Bogenjien 2015 (k=104)		0.03	[0.02; 0.04]
Adding Wongkomrat 2015 (k=105)		0.03	[0.02; 0.04]
Adding Yaffee 2015 (k=106)		0.03	[0.02; 0.04]
Adding Youssef 2015 (k=107)		0.03	[0.02; 0.04]
Adding Zamor 2015 (k=108)		0.03	[0.02; 0.04]
Adding Wynn 2016 (k=109)		0.03	[0.02; 0.04]
Adding Coselli 2016 (k=110)		0.03	[0.02; 0.04]
Adding Duan 2016 (k=111)		0.03	[0.02; 0.04]
Adding Eagleton 2016 (k=112)		0.03	[0.02; 0.04]
Adding Fernandez 2016 (k=113)		0.03	[0.02; 0.04]
Adding Fukui 2016 (k=114)		0.03	[0.02; 0.04]
Adding Huang 2016 (k=115)		0.03	[0.02; 0.04]
Adding Murana 2016 (k=116)		0.03	[0.02; 0.04]
Adding Naguib 2016 (k=117)		0.03	[0.02; 0.04]
Adding Pompa 2016 (k=118)		0.03	[0.02; 0.04]
Adding Shiraev 2016 (k=119)		0.03	[0.02; 0.04]
Adding Song 2016 (k=120)		0.03	[0.02; 0.04]
Adding Zeng 2016 (k=121)		0.03	[0.02; 0.04]
Adding Baba 2017 (k=122)		0.03	[0.02; 0.04]
Adding Chen 2017 (k=123)		0.03	[0.02; 0.04]
Adding Conrad 2017 (k=124)		0.03	[0.02; 0.04]
Adding Gallitto 2017 (k=125)		0.03	[0.02; 0.04]
Adding Gombert 2017 (k=126)		0.03	[0.02; 0.04]
Adding He 2017 (k=127)		0.03	[0.02; 0.04]
Adding Hicks 2017 (k=128)		0.03	[0.02; 0.04]
Adding Liu 2017 (k=129)		0.03	[0.02; 0.04]
Adding Meltzer 2017 (k=130)		0.03	[0.02; 0.04]
Adding Mizoguchi 2017 (k=131)		0.03	[0.02; 0.04]
Adding Oderich 2017_2 (k=132)		0.03	[0.02; 0.04]
Adding Omura 2017 (k=133)		0.03	[0.02; 0.04]
Adding Sugiura 2017 (k=134)		0.03	[0.02; 0.04]
Adding Wahlgren 2017 (k=135)		0.03	[0.03; 0.04]
Adding Zhang 2017 (k=136)		0.03	[0.03; 0.04]
Adding Thomas 2018 (k=137)		0.03	[0.03; 0.04]
Adding Zhu 2018 (k=138)		0.03	[0.03; 0.04]
Adding Youssef 2018 (k=139)		0.03	[0.03; 0.04]
Adding Zha 2018 (k=140)		0.03	[0.03; 0.04]
Adding Al Adas 2018 (k=141)		0.03	[0.03; 0.04]
Adding Bertoglio 2018 (k=142)		0.03	[0.03; 0.04]
Adding Canaud 2018 (k=143)		0.03	[0.02; 0.04]
Adding Clough 2018 (k=144)		0.03	[0.02; 0.04]
Adding Ding 2018 (k=145)		0.03	[0.02; 0.04]
Adding Faure 2018 (k=146)		0.03	[0.02; 0.04]
Adding Fujikawa 2018 (k=147)		0.03	[0.02; 0.04]
Adding Gocze 2018 (k=148)		0.03	[0.02; 0.04]
Adding Gombert 2018 (k=149)		0.03	[0.03; 0.04]
Adding Hiraoka 2018 (k=150)		0.03	[0.03; 0.04]
Adding Kratimenos 2018 (k=151)		0.03	[0.03; 0.04]
Adding Li 2018_2 (k=152)		0.03	[0.03; 0.04]
Adding Lortz 2018 (k=153)		0.03	[0.03; 0.04]
Adding Lou 2018 (k=154)		0.03	[0.02; 0.04]
Adding Lou 2018 (k=155)		0.03	[0.02; 0.04]
Adding Lucatelli 2018 (k=156)		0.03	[0.02; 0.04]
Adding Mazzeffi 2018 (k=157)		0.03	[0.02; 0.04]
Adding Mkalaluh 2018 (k=158)		0.03	[0.03; 0.04]
Adding Monaco 2018 (k=159)		0.03	[0.03; 0.04]
Adding Monnot 2018 (k=160)		0.03	[0.03; 0.04]
Adding Monnot 2018 (k=161)		0.03	[0.03; 0.04]
Adding Peidro 2018 (k=162)		0.03	[0.03; 0.04]

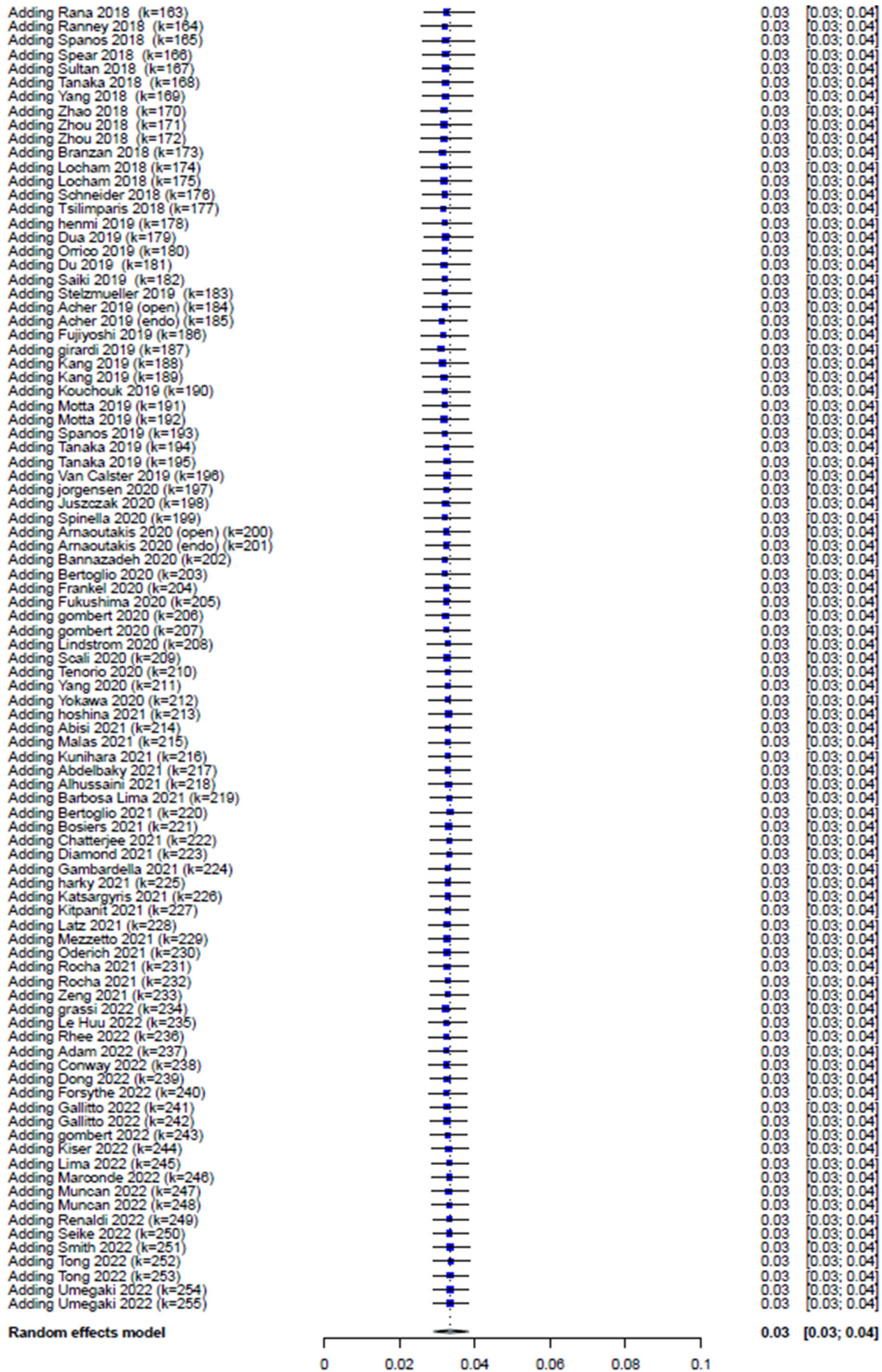


Figure S19 Permanent SCI trend based on years. SCI, spinal cord injury.

Table S1 Full search strategy**Ovid MEDLINE ALL (July 1, 2018 to September 13, 2022)**

Searched on September 13, 2022

Line #	Search
1	Aneurysm/ and (Aorta, Thoracic/ or Aorta, Abdominal/ or Aorta/)
2	Aortic Aneurysm/
3	Aortic Aneurysm, Thoracic/
4	Aortic Aneurysm, Abdominal/
5	((aneurysm* or aneurism* or aneurysma*) adj2 (aorta* or aortic*)).tw.
6	Marfan Syndrome/
7	(Marfan syndrome or Marfan's syndrome or Marfans syndrome or marfan abiotrophy or Marfan disease or Marfan's disease or Marfans disease or Marfan achard syndrome or Marfan's achard syndrome or Marfans achard syndrome or Marfan hallez syndrome or Marfan's hallez syndrome or Marfans hallez syndrome).tw.
8	Loeys-Dietz Syndrome/
9	(Loeys-Dietz Syndrome or LoeysDietz Syndrome).tw.
10	or/1-9
11	(TEVAR or TAAA or TAA).tw.
12	((thoracic or thoracoabdominal) adj2 (aorta* or aortic*)).tw.
13	11 or 12
14	10 and 13
15	limit 14 to (english language and yr="2008 -Current")

Ovid EMBASE (July 1, 2018 to September 13, 2022)

Searched on September 13, 2022

Line #	Search
1	aneurysm/ and (thoracic aorta/ or abdominal aorta/ or aorta/)
2	thoracic aorta aneurysm/
3	thoracoabdominal aorta aneurysm/ or abdominal aorta aneurysm/
4	aortic aneurysm/
5	((aneurysm* or aneurism* or aneurysma*) adj2 (aorta* or aortic*)).tw.
6	Marfan syndrome/
7	(Marfan syndrome or Marfan's syndrome or Marfans syndrome or marfan abiotrophy or Marfan disease or Marfan's disease or Marfans disease or Marfan achard syndrome or Marfan's achard syndrome or Marfans achard syndrome or Marfan hallez syndrome or Marfan's hallez syndrome or Marfans hallez syndrome).tw.
8	Loeys Dietz syndrome/
9	(Loeys-Dietz Syndrome or LoeysDietz Syndrome).tw.
10	or/1-9
11	(TEVAR or TAAA or TAA).tw.
12	((thoracic or thoracoabdominal) adj2 (aorta* or aortic*)).tw.
13	11 or 12
14	10 and 13
15	limit 14 to (english language and yr="2008 -Current")

Cochrane Library (Wiley; July 1, 2018 to September 13, 2022)	
Searched on September 13, 2022	
Line #	Search
#1	MeSH descriptor: [Aneurysm] this term only
#2	MeSH descriptor: [Aorta, Thoracic] this term only
#3	MeSH descriptor: [Aorta, Abdominal] this term only
#4	MeSH descriptor: [Aorta] this term only
#5	#2 or #3 or #4
#6	#1 and #5
#7	MeSH descriptor: [Aortic Aneurysm] this term only
#8	MeSH descriptor: [Aortic Aneurysm, Thoracic] this term only
#9	MeSH descriptor: [Aortic Aneurysm, Abdominal] this term only
#10	((aneurysm or aneurism or aneurysma) near/2 (aorta or aortic)):ti,ab,kw
#11	MeSH descriptor: [Marfan Syndrome] this term only
#12	(Marfan syndrome or Marfan's syndrome or Marfans syndrome or marfan abiotrophy or Marfan disease or Marfan's disease or Marfans disease or Marfan achard syndrome or Marfan's achard syndrome or Marfans achard syndrome or Marfan hallez syndrome or Marfan's hallez syndrome or Marfans hallez syndrome):ti,ab,kw
#13	MeSH descriptor: [Loeys-Dietz Syndrome] this term only
#14	(Loeys-Dietz Syndrome or LoeysDietz Syndrome):ti,ab,kw
#15	#6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14
#16	(TEVAR or TAAA or TAA):ti,ab,kw
#17	((thoracic or thoracoabdominal) near/2 (aorta or aortic)):ti,ab,kw
#18	#16 or #17
#19	#15 and #18

Table S2 Summary of the included studies

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Abdelbaky 2021	Yale University	United States	2006–2017	100	Retrospective	Open
Abisi 2021	Guy's and St. Thomas' Hospital	United Kingdom	2018–2020	44	Retrospective	Endovascular
Acher 2019	University of Wisconsin	United States	1984–2014	202	Retrospective	Both
Adam 2022	University of Birmingham	United Kingdom	1999–2019	58	Retrospective	Open
Afifi 2015	University of Texas Medical School	United States	2001–2014	37	Retrospective	Endovascular
Al Adas 2018	Henry Ford Hospital	United States	2003–2012	11	Retrospective	Endovascular
Albors 2009	Hospital Clinico Universitario	Spain	2003–2008	25	Retrospective	Endovascular
Alhussaini 2021	University of Florida	United States	2008–2018	84	Retrospective	Open
Andacheh 2011	Harbor-UCLA Medical Center	United States	2002–2010	73	Prospective	Endovascular
Andersen 2014	Duke University	United States	2005–2013	32	Retrospective	Open
Anderson 2014	University of South Dakota	United States	2012–2014	14	Retrospective	Endovascular
Arnaoutakis 2015	Johns Hopkins	United States	2002–2013	62	Retrospective	Endovascular
Arnaoutakis 2020	University of Florida	United States	2002–2018	158	Retrospective	Both
Baba 2017	Jikei University School of Medicine	Japan	2006–2015	44	Retrospective	Endovascular
Bannazadeh 2020	Mount Sinai West Hospital	United States	2014–2017	38	Retrospective	Endovascular
Barbosa Lima 2021	University of Texas Health Science Center	United States	2013–2020	110	Prospective	Endovascular
Bashir 2014	Liverpool Heart & Chest Hospital	United Kingdom	1998–2014	62	Retrospective	Endovascular
Belov 2009	National Research Center of Surgery	Russia	2000–2007	16	Retrospective	Open
Bertoglio 2018	San Raffaele Scientific Institute	Italy	2015–2017	18	Retrospective	Open
Bertoglio 2020	Vita Salute University	Italy	2013–2018	80	Prospective	Endovascular
Bertoglio 2021	Multicenter	Italy	2007–2019	240	Retrospective	Endovascular
Bisdas 2015	St. Franziskus Hospital	Germany	2010–2014	142	Retrospective	Endovascular
Böckler 2009	Ruprecht-Karls University	Germany	1997–2008	54	Retrospective	Endovascular
Bosiers 2021	St Franziskus Hospital	Germany	2012–2015	80	Retrospective	Endovascular
Botsios 2014	University Witten/Herdecke & St.-Johannes Hospital Dortmund	Germany	2001–2011	21	Retrospective	Endovascular
Branzan 2018	University Hospital Leipzig	Germany	2014–2017	57	Retrospective	Endovascular
Canaud 2018	Multicenter	Multi-national	2013–2017	24	Retrospective	Endovascular
Chatterjee 2021	Baylor College of Medicine	United States	2006–2016	392	Retrospective	Open

Table S2 (continued)

Table S2 (continued)

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Chen 2013	Nanjing Medical University	China	2000–2011	174	Prospective	Endovascular
Chen 2017	Eastern Virginia Medical School	United States	2008–2014	30	Retrospective	Endovascular
Clough 2012	Guy's and St Thomas' NHS Foundation Trust	United Kingdom	2008–2011	31	Retrospective	Endovascular
Clough 2018	Universite Paris Sud	France	NA	64	Retrospective	Endovascular
Conrad 2017	Massachusetts General Hospital	United States	2006–2009	160	Prospective	Endovascular
Conway 2014	Lenox Hill Hospital	United States	1999–2010	86	Retrospective	Open
Conway 2022	VQI (Lenox Hill)	United States	2003–2021	25	Retrospective	Endovascular
Coselli 2016	Baylor College of Medicine	United States	1986–2014	3309	Retrospective	Open
Da Rocha 2010	University of Barcelona	Spain	2006–2009	57	Retrospective	Endovascular
Davidovic 2011	University of Belgrade & Clinical Center of Serbia	Serbia	1999–2009	118	Retrospective	Open
Diamond 2021	University of Massachusetts	United States	2010–2018	87	Retrospective	Endovascular
Dias 2015	Skane University Hospital	Sweden	2008–2014	72	Retrospective	Endovascular
Dick 2008	University of Bern	switzerland	2001–2005	174	Prospective	Both
Ding 2018	Guangdong Academy of Medical Sciences	China	2012–2017	159	Retrospective	Endovascular
Dong 2022	Anzhen Hospital	China	2011–2019	183	Retrospective	Open
Du 2019	People's Hospital of Xinjiang Uygur Autonomous Region	China	2004–2016	163	Retrospective	Endovascular
Dua 2019	Stanford Hospitals	United States	2015–2018	21	Retrospective	Endovascular
Duan 2016	Capital Medical University	China	2014–2015	28	Retrospective	Open
Dufour 2015	Louis Pradel University Hospital	France	1999–2007	74	Retrospective	Endovascular
Eagleton 2016	Cleveland Clinic	United States	2004–2013	354	Prospective	Endovascular
Estrera 2015	University of Texas Medical School	United States	1991–2014	519	Retrospective	Open
Faure 2018	Georges Pompidou European Hospital	France	2011–2017	41	Retrospective	Open
Fernandez 2016	University of California at San Francisco	United States	2005–2014	133	Prospective	Endovascular
Ferreira 2008	Servico Integrado de Tecnicas Endovasculares	Brazil	2006–2008	11	Retrospective	Endovascular
Fioranelli 2011	Hospital de Sao Paulo	Brazil	2004–2007	23	Retrospective	Endovascular
Forsythe 2022	Royal Infirmary of Edinburgh	United Kingdom	1999–2021	248	Retrospective	Endovascular
Fossaceca 2013	A. Avogadro University & Maggiore Della Carita Hospital	Italy	2005–2011	53	Retrospective	Open

Table S2 (continued)

Table S2 (continued)

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Frankel 2020	GenTAC Registry	United States	2006–2014	142	Retrospective	Endovascular
Fujikawa 2018	Kawasaki Aortic Center	Japan	2015–2016	168	Retrospective	Open
Fujiyoshi 2019	Tokyo Medical University Hospital	Japan	2011–2018	69	Retrospective	Open
Fukui 2016	Sakakibara Heart Institute	Japan	2009–2015	44	Retrospective	Open
Fukushima 2020	Jikei University School of Medicine	Japan	2010–2017	16	Retrospective	Open
Gallitto 2017	University of Bologna	Italy	2010–2015	94	Prospective	Endovascular
Gallitto 2022	University of Bologna	Italy	2010–2020	137	Retrospective	Endovascular
Gallitto 2022	University of Bologna	Italy	2010–2020	65	Retrospective	Endovascular
Gambardella 2021	Weill Cornell Medicine	United States	1997–2019	869	Retrospective	Open
Garbade 2010	University of Leipzig	Germany	2000–2008	46	Retrospective	Endovascular
Gillen 2015	University of Virginia	United States	2005–2012	158	Retrospective	Both
Girardi 2019	Weill Cornell Medicine	United States	1997–2017	783	Retrospective	open
Gocze 2018	University Hospital Regensburg	Germany	2013–2017	18	Prospective	Endovascular
Gombert 2017	RWTH University Hospital Aachen	Germany	2006–2016	52	Retrospective	Open
Gombert 2018	RWTH University Hospital Aachen	Germany	2014–2015	76	Prospective	Endovascular
Gombert 2020	University Hospital RWTH	Germany	2017–2018	33	Retrospective	Both
Gombert 2022	University Hospital RWTH	Germany	2006–2019	255	Retrospective	Open
Grassi 2022	Opsedale maggiore policlinico	Italy	2010–2016	310	Retrospective	Endovascular
Guangqi 2009	Hospital of Sun Yat-sen University	China	2001–2006	121	Retrospective	Endovascular
Guo 2015	Zhongshan Hospital, Fudan University	China	2011–2012	47	Prospective	Endovascular
Harky 2021	Liverpool Heart and Chest Hospital	United Kingdom	1998–2019	430	Retrospective	Open
He 2015	Third Xiangya Hospital of Central South University	China, USA	2010–2013	148	Retrospective	Endovascular
He 2017	General Hospital of Shenyang Military Region	China	2007–2014	388	Retrospective	Endovascular
Heijmen 2012	Multicenter	Multi-national	2009–2010	100	Prospective	Endovascular
Henmi 2019	Kobe University Graduate School of Medicine	Japan	1999–2018	172	Retrospective	Open
Hicks 2017	Johns Hopkins	United States	2006–2015	137	Retrospective	Open
Hiraoka 2018	Kurashiki Central Hospital	Japan	2008–2014	175	Retrospective	Endovascular
Hnath 2008	Albany Medical College	United States	2004–2006	121	Prospective	Endovascular
Hoshina 2021	University of Tokyo	Japan	2006–2016	14235	Retrospective	Endovascular

Table S2 (continued)

Table S2 (continued)

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Huang 2016	Affiliated Hospital of Nantong University	China	2011–2014	27	Retrospective	Endovascular
Inglese 2008	San Donato Milanese Hospital	Italy	2002–2007	41	Retrospective	Endovascular
Jayia 2015	Royal Free Hospital NHS Trust	United Kingdom	2008–2014	47	Retrospective	Endovascular
Jing 2008	Shenyang Northern Hospital	China	2002–2007	67	Prospective	Endovascular
Johns 2014	Royal Infirmary of Edinburgh	United Kingdom	1999–2013	37	Retrospective	Open
Jorgensen 2020	University of South Dakota	United States	2015–2019	44	Prospective	Endovascular
Juszczak 2020	University Hospitals Birmingham	United Kingdom	2009–2018	54	Retrospective	Endovascular
Kamada 2015	Iwate Medical University	Japan	2002–2014	51	Retrospective	Endovascular
Kang 2019	University of Washington	United States	2009–2017	122	Retrospective	Both
Kasprzak 2014	University Hospital Regensburg	Germany	2009–2012	83	Retrospective	Endovascular
Katsargyris 2015	Paracelsus Medical University	Germany	2004–2014	218	Prospective	Endovascular
Katsargyris 2021	General Hospital Nuremberg, Paracelsus Medical University	Germany	2010–2020	30	Retrospective	Endovascular
Kieffer 2008	Pitie-Salpetriere University Hospital	France	1991–2006	171	Retrospective	Open
Kinoshita 2015	Tokushima University Graduate School	Japan	2008–2012	13	Retrospective	Endovascular
Kiser 2022	Memorial Hermann Hospital	United States	1991–2017	1474	Retrospective	Open
Kitamura 2013	Kitasato University School of Medicine	Japan	1998–2012	53	Retrospective	Endovascular
Kitpanit 2021	Weill Cornell Medicine	United States	2014–2019	106	Prospective	Endovascular
Kouchoukos 2019	Missouri Baptist Medical Center	United States	1986–2015	285	Retrospective	Open
Kratimenos 2018	Evangelismos General Hospital of Athens	Greece	2014–2017	30	Retrospective	Endovascular
Kulik 2011	Missouri Baptist Medical Center	United States	1986–2008	218	Retrospective	Open
Kunihara 2009	Hokkaido University Hospital	Japan	1998–2006	17	Retrospective	Open
Kunihara 2021	The Jikei University School of Medicine	Japan	1996–2016	182	Retrospective	Open
Kurimoto 2008	Sapporo Medical University	Japan	2001–2005	40	Retrospective	Endovascular
Lancaster 2013	Massachusetts General Hospital	United States	1987–2011	485	Retrospective	Open
Latz 2021	Massachusetts General Hospital	United States	1989–2015	234	Retrospective	Open
Le Huu 2022	Baylor College of Medicine	United States	2002–2020	37	Retrospective	Endovascular

Table S2 (continued)

Table S2 (continued)						
Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Lee 2012	Yonsei University College of Medicine	South Korea	2006–2013	28	Retrospective	Open
Lee 2015	Yonsei University College of Medicine	South Korea	2006–2013	167	Retrospective	Both
Li 2015	Beijing Anzhen Hospital, Capital Medical University	China	2009–2013	579	Retrospective	Endovascular
Li 2018	Second Xiangya Hospital of Central South University	China	2013–2014	134	Retrospective	Endovascular
Lima 2012	Cleveland Clinic	United States	2002–2010	330	Prospective	Open
Lima 2022	The University of Texas Health Science Center at Houston	United States	2013–2020	115	Prospective	Endovascular
Lindstrom 2020	Karolinska University Hospital	Sweden	2009–2018	17	Retrospective	Endovascular
Liu 2011	Shanghai Jiao Tong University School of Medicine	China	2004–2009	51	Retrospective	Endovascular
Liu 2017	Changhai Hospital, Second Military Medical University	China	1998–2014	322	Retrospective	Endovascular
Lobato 2012	Hospital de Sao Paulo	Brazil	2008–2012	15	Prospective	Endovascular
Locham 2018	National database	United States	2009–2015	879	Retrospective	Both
Lortz 2018	University of Duisburg-Essen	Germany	2006–2016	45	Retrospective	Endovascular
Lou 2018	Emory University School of Medicine	United States	2000–2016	587	Retrospective	Both
Lucatelli 2018	Azienda Ospedaliera Universitaria Senese	Italy	2011–2017	49	Retrospective	Endovascular
Malas 2021	Multicenter	United States	2014–2018	45	Prospective	Endovascular
Manning 2009	Malmo University Hospital UMAS	Sweden	2001–2008	52	Retrospective	Endovascular
Marcondes 2022	Multicenter	Multi-national	2012–2021	541	Retrospective	Endovascular
Martin 2009	University of Florida	United States	2000–2007	261	Retrospective	Endovascular
Marzelle 2015	University Paris XII	France	2009–2012	42	Randomized clinical trial	Endovascular
Mastroroberto 2010	University Magna Grecia	Italy	2001–2008	62	Retrospective	Both
Mazzeffi 2018	University of Maryland	United States	2011–2015	102	Retrospective	Endovascular
Meltzer 2017	Weill Cornell Medicine	United States	NA	22	Prospective	Endovascular
Messe 2008	University of Pennsylvania	United States	2000–2005	224	Retrospective	Open
Mezzetto 2021	Multicenter	Italy	2005–2019	129	Prospective	Endovascular
Min 2010	Samsung Medical Center	South Korea	2006–2009	33	Retrospective	Open
Mishra 2008	Rikshospitalet Radiumhospitalet Medical Center	Norway	NA	14	Prospective	Open

Table S2 (continued)

Table S2 (continued)

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Mitchell 2011	University of Mississippi	United States	2007–2010	44	Retrospective	Endovascular
Mizoguchi 2017	Yamaguchi Prefecture Grand Medical Center	Japan	2007–2015	38	Retrospective	Endovascular
Mkalaluh 2018	University of Heidelberg	Germany	2007–2017	38	Retrospective	Open
Monaco 2018	San Raffaele Scientific Institute	Italy	2009–2016	459	Retrospective	Open
Monnot 2018	Rouen University Hospital	France	2007–2015	60	Retrospective	Both
Mosquera 2009	Juan Canalejo Hospital	Spain	2000–2008	20	Retrospective	Endovascular
Motta 2019	University of North Carolina	United States	2012–2017	223	Prospective	Endovascular
Motta 2019	University of North Carolina	United States	2012–2017	150	Prospective	Endovascular
Moulakakis 2015	Multicenter	Greece	2010–2013	30	Prospective	Endovascular
Muncan 2022	Stony Brook University Hospital	United States	2010–2020	255	Retrospective	Both
Murana 2016	St Antonius Hospital	Netherlands	1994–2014	542	Retrospective	Open
Naguib 2016	Frankfurt University	Germany	2002–2010	53	Retrospective	Endovascular
Narayan 2011	Bristol Heart Institute	United Kingdom	1996–2009	49	Retrospective	Endovascular
Naughton 2012	Northwestern	United States	2001–2010	100	Retrospective	Open
Neo 2011	Tan Tock Seng Hospital	Singapore	2004–2009	18	Retrospective	Endovascular
Nomura 2015	Kobe University Graduate School of Medicine	Japan	2008–2014	54	Retrospective	Endovascular
Ockert 2009	University of Heidelberg	Germany	1997–2004	30	Retrospective	Open
Oderich 2017	Mayo Clinic Rochester	United States	2007–2016	185	Retrospective	Endovascular
Oderich 2021	University of Texas Health Science Center at Houston	United States	2013–2020	297	Prospective	Endovascular
Omura 2014	Kobe University Graduate School of Medicine	Japan	1999–2012	115	Retrospective	Open
Omura 2017	National Cerebral and Cardiovascular Center	Japan	2003–2014	223	Retrospective	Open
Orrico 2019	San Camillo Forlanini Hospital	Italy	2015–2017	32	Retrospective	Endovascular
Pacini 2013	Multicenter	Italy	2000–2008	93	Retrospective	Endovascular
Patel 2009	University of Michigan Hospitals	United States	1997–2008	69	Retrospective	Endovascular
Pearce 2008	University of Alabama	United States	2005–2007	15	Retrospective	Endovascular
Peidro 2018	Hopital Nord, Aix-Marseille University	France	2007–2015	76	Retrospective	Endovascular
Piffaretti 2015	Multicenter	Multi-national	2000–2012	56	Retrospective	Endovascular
Piscione 2007	“Federico II” University, Naples	Italy	2002–2004	33	Retrospective	Endovascular
Pitton 2008	University Hospital of Mainz	Germany	1995–2007	22	Retrospective	Endovascular

Table S2 (continued)

Table S2 (continued)

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Pompa 2016	Sapienza University of Rome	Italy	2010–2012	28	Retrospective	Endovascular
Qing 2012	The University of Hong Kong-Queen Mary Hospital	Hong Kong	NA	32	Retrospective	Endovascular
Rahe.Meyer 2009	Hannover Medical School	Germany	NA	18	Retrospective	Open
Rajbanshi 2015	Yale University	United States	2000–2014	66	Retrospective	Open
Rana 2018	Mayo Clinic Rochester	United States	1999–2011	121	Retrospective	Open
Ranney 2018	Duke University	United States	2005–2016	192	Retrospective	Endovascular
Raupach 2013	Faculty Hospital Hradec Kralove	Czech Republic	1999–2012	72	Retrospective	Endovascular
Rinaldi 2022	Multicenter	Italy	2008–2017	351	Retrospective	Endovascular
Rhee 2022	Asan Medical Center	South Korea	2015–2019	20	Retrospective	Open
Rocha 2021	University of Toronto	Canada	2006–2017	664	Retrospective	Both
Rodriguez 2008	Arizona Heart Institute	United States	2000–2006	106	Retrospective	Endovascular
Rossi 2015	St Thomas Hospital	United Kingdom	2008–2014	69	Retrospective	Endovascular
Rylski 2013	University Heart Center Freiburg	Germany	2000–2011	36	Retrospective	Endovascular
Saiki 2019	Tohoku University	Japan	2011–2015	50	Retrospective	Open
Scali 2020	University of Florida	United States	2014–2019	6529	Retrospective	Endovascular
Schneider 2018	Weill Cornell Medicine, NewYork-Presbyterian Hospital	United States	2014–2017	50	Prospective	Endovascular
Seike 2022	National Cerebral and Cardiovascular Center	Japan	2009–2020	204	Retrospective	Endovascular
Shah 2010	New York University	United States	2004–2008	30	Retrospective	Endovascular
Shimizu 2014	Keio University Hospital	Japan	2008–2012	37	Prospective	Open
Shirayev 2016	(2) Royal Prince Alfred Hospital, St George Hospital	Australia	2003–2013	179	Retrospective	Open
Shu 2011	Second Xiangya Hospital of Central South University	China	2002–2009	45	Retrospective	Endovascular
Si 2014	Zhongshan Hospital, Fudan University	China	2009–2010	56	Prospective	Endovascular
Smith 2022	Case Western Reserve University School of Medicine, University Hospitals Cleveland Medical Center	United States	2012–2020	813	Retrospective	Endovascular
Song 2016	Shanghai Hospital	China	1999–2015	135	Retrospective	Endovascular
Spanos 2018	University Hospital Hamburg-Eppendorf & Hamburg University Heart Center	Germany	2014–2017	42	Retrospective	Endovascular
Spanos 2019	German Aortic Center Hamburg	Germany	2011–2017	126	Retrospective	Endovascular

Table S2 (continued)

Table S2 (continued)						
Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Spear 2018	Aortic Center, CHRU, Lille	France	2011–2017	22	Retrospective	Endovascular
Spinella 2020	University of Genoa	Italy	2017–2019	11	Retrospective	Endovascular
Steingruber 2008	Innsbruck Medical University	Austria	1996–2007	35	Retrospective	Endovascular
Stelzmueller 2019	University of Vienna	Austria	2001–2016	55	Retrospective	Endovascular
Sugiura 2017	Nagoya University Graduate School of Medicine	Japan	2002–2015	118	Retrospective	Open
Sultan 2018	University of Pittsburgh	United States	2013–2016	33	Retrospective	Endovascular
Sweet 2015	University of Washington	United States	2011–2015	24	Prospective	Endovascular
Tabayashi 2010	Tohoku University	Japan	1998–2007	102	Retrospective	Open
Takahashi 2011	Hiroshima University Hospital	Japan	2005–2008	15	Retrospective	Open
Tanaka 2018	The University of Texas Health Science Center at Houston	United States	2005–2014	88	Retrospective	Endovascular
Tanaka 2019	University of Texas Health Science Center at Houston (UTHealth)	United States	1991–2017	2012	Retrospective	Open
Tang 2011	TongJi University	China	2007–2008	30	Retrospective	Endovascular
Tenorio 2020	Multicenter	United States	2014–2017	240	Retrospective	Endovascular
Thomas 2018	University Hospital, Klinikum Oldenburg AoR	Germany	2011–2017	22	Retrospective	Endovascular
Tong 2022	Cleveland Clinic	United States	2000–2010	556	Retrospective	Both
Trimarchi 2010	University of Milan	Italy	1988–2002	18	Retrospective	Open
Tsilimparis 2018	Multicenter	Germany	2004–2013	329	Prospective	Endovascular
Ullery 2012	University of Pennsylvania	United States	2001–2010	530	Retrospective	Endovascular
Umegaki 2022	Multicenter	Japan	2010–2019	6202	Retrospective	Both
Vaislic 2014	Multicenter	France	2010–2011	23	Prospective	Endovascular
van Bogerijen 2015	University of Michigan Hospitals	United States	1993–2013	122	Retrospective	Open
Van Calster 2019	Aortic Center of CHU	France	2004–2016	373	Retrospective	Endovascular
Wahlgren 2017	Karolinska University Hospital	Sweden	2004–2015	90	Retrospective	Open
Watson 2010	Riverside Methodist Hospital	United States	2002–2008	21	Prospective	Open
Weiss 2012	Mount Sinai School of Medicine	United States	2002–2008	240	Retrospective	Open
Wojciechowski 2014	Medical University of Gdansk	Poland	2004–2012	72	Retrospective	Endovascular
Wongkornrat 2015	Kawasaki Aortic Center	Japan	2007–2011	200	Retrospective	Open
Wynn 2016	University of Wisconsin	United States	1989–2013	805	Retrospective	Open
Xiong 2013	Chinese PLA General Hospital	China	2004–2010	26	Retrospective	Endovascular
Yaffee 2015	New York University Langone Medical Center	United States	2010–2011	132	Retrospective	Open

Table S2 (continued)

Table S2 (continued)

Study	Institution	Country	Study period	No. of patients	Type of study	Surgical approach reported
Yang 2018	Shenzhen Second Hospital, Sichuan Provincial People's Hospital	China	2010–2015	671	Retrospective	Endovascular
Yang 2020	Nanjing Drum Tower Hospital	China	2016–2019	60	Retrospective	Endovascular
Yokawa 2020	Kobe University School of Medicine	Japan	1999–2016	251	Retrospective	Open
Yoo 2014	Asan Medical Center, University of Ulsan College of Medicine	South Korea	1994–2011	212	Retrospective	Open
Youssef 2015	University Medical Center, Johannes-Gutenberg University	Germany	1998–2012	62	Retrospective	Open
Youssef 2018	University Medical Center, Johannes-Gutenberg University	Germany	2012–2016	30	Retrospective	Endovascular
Yunoki 2014	Osaka University Graduate School of Medicine	Japan	2008–2011	36	Retrospective	Endovascular
Yuri 2012	Saitama Medical Center of Jichi Medical University	Japan	2006–2009	30	Retrospective	Endovascular
Zamor 2015	Northwestern	United States	2001–2013	80	Retrospective	Endovascular
Zanetti 2015	Policlinic of Monza	Italy	1994–2014	51	Retrospective	Open
Zeng 2016	West China Hospital, Sichuan University	China	NA	131	Retrospective	Endovascular
Zeng 2021	Changhai Hospital	China	2017–2020	10	Prospective	Endovascular
Zha 2018	Anhui Medical University	China	2012–2016	22	Retrospective	Endovascular
Zhang 2017	General Hospital of People's Liberation Army	China	2011–2013	85	Retrospective	Endovascular
Zhao 2018	First Affiliated Hospital, Sun Yat-sen University	China	2013–2014	68	Retrospective	Endovascular
Zhou 2018	Qingdao University	China	2012–2016	66	Retrospective	Endovascular
Zhu 2018	General Hospital of Tianjin Medical University	China	2015–2016	20	Retrospective	Endovascular

Table S3 Demographics of patients in the included studies																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Abdelbaky 2021(1)	65.4±11.7	60	15	97	66	32	16	23	66	43	2	100	98	NR	NR	NR	NR	NR	NR	72
Abisi 2021 (2)	77	83	14	74	12	NA	33	17	NR	NR	NR	0	NR	NR	NR	NR	NR	NR	NR	NR
Acher 2019 (3)	69	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Acher 2019 (3)	73	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Adam 2022 (4)	41±9.62	57	1.7	60.3	NA	3.4	1.7	10.3	79	57	0	100	100	NA	53.4	NR	NR	NR	5±0.74	48.2
Affi 2015 (5)	61.3±15.3	67.6	NR	NR	NR	NR	NR	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Al Adas 2018 (6)	NR	NR	NR	NR	NR	NR	NR	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Albors 2009 (7)	63	84	4	84	64	12	8	28	NR	52	24	NR	NR	NR	NR	NR	NR	NR	NR	NR
Alhussaini 2021 (8)	56.6±13.7	76	17.8	76.2	55.9	16	14.8	10.7	71.4	60.6	7.1	78.5	45	NA	54.7	NR	NR	NR	NR	19
Andacheh 2011 (9)	58	71.2	NR	NR	NR	NR	NR	NR	NR	100	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Andersen 2014 (10)	63	84.4	3.1	90.6	62.5	27.6	13.8	18.7	65.6	100	0	100	NR	NR	NR	NR	NR	NR	NR	NR
Anderson 2014 (11)	73.2	NR	28.6	92.9	100	28.6	78.6	64.3	35.7	NR	NR	92.9	NR	NR	NR	NR	NR	NR	NR	NR
Arnaoutakis 2015 (12)	67.6±12.9	53.2	16.1	88.7	58.1	33.9	NR	25.8	NR	17.7	NR	75.8	NR	NR	NR	NR	NR	NR	NR	NR
Arnaoutakis 2020 (13)	59±12	73	8	91	NR	36	50	24	27	52	0	94	4	NR	6	NR	38	NR	NR	30
Arnaoutakis 2020 (13)	72±8	62	18	98	NR	42	38	57	4	8	0	74	NR	NR	NR	NR	NR	NR	NR	NR
Baba 2017 (14)	75.3	77.3	27.3	88.6	NR	59.1	NR	25	59.1	0	0	31.8	NR	NR	NR	NR	NR	NR	NR	NR
Bannazadeh 2020 (15)	76.5	60.5	10.5	81.5	86.3	39.4	10.5	18.4	NR	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Barbosa Lima 2021 (16)	73±8	50	13	94	72	32	44	28	NR	23	0	74	NR	NR	NR	NR	NR	NR	NR	NR
Bashir 2014 (17)	52.4±14.4	72.6	0	59.7	16.1	3.2	9.7	8.1	NR	100	0	NR	19.4	NR	NR	NR	NR	NR	NR	NR
Belov 2009 (18)	45.1	62.5	12.5	81.2	NR	NR	NR	25	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bertoglio 2018 (19)	74.7	77.8	0	94.4	88.9	NR	27.8	77.7	94.4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bertoglio 2020 (20)	74.1±8.14	70	15	96	69	60	48	32	36	NR	NR	0	NR	NR	NR	NR	NR	NR	NR	NR
Bertoglio 2021 (21)	73±6.66	76	27	97	72	NR	34	NR	10	14	0	54	NR	NR	NR	NR	NR	NR	NR	NR
Bisdas 2015 (22)	70.0±7.0	78.9	12	93.7	58.4	44.4	5.6	27.5	47.2	9.1	NR	45.1	NR	NR	NR	NR	NR	NR	NR	NR
Böckler 2009 (23)	57	74.1	NR	NR	NR	NR	NR	NR	NR	100	42.6	NR	NR	NR	NR	NR	NR	NR	NR	NR
Bosiers 2021 (24)	71±7.4	70	10	83.8	52.5	35	30	22.5	NR	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Botsios 2014 (25)	66.1±12.4	71.5	9.5	80.9	19	23.8	28.5	9.5	14.2	42.9	42.9	NR	NR	NR	NR	NR	NR	NR	NR	NR
Branzan 2018 (26)	69.6±7.6	75	36	100	68	38	35	33	12.2	0	0	0	NR	NR	NR	NR	NR	NR	NR	NR
Canaud 2018 (27)	68.9±9.0	70.8	25	91.6	NR	20.8	8.4	12.5	NR	37.5	37.5	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chatterjee 2021 (28)	68.7±6.24	60.5	15.6	94.9	82.6	42.6	43.8	37.2	20.1	31.3	3.3	77.3	46.9	35.2	NR	NR	NR	52.3	NR	37.7
Chen 2013 (29)	56.3	89.1	5.7	86.8	62.6	27.6	4.6	2.9	NR	100	67.8	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chen 2017 (30)	62.5	70	13.3	90	63.3	16.7	13.3	13.3	NR	100	100	43.3	NR	NR	NR	NR	NR	NR	NR	NR
Clough 2012 (31)	71	67.7	6.5	80.6	NR	32.3	45.1	16.1	19.4	3.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Clough 2018 (32)	58.5±12.7	79.7	9.9	75	NR	4.7	0	NR	0	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Conrad 2017 (33)	72.2±9.1	59.4	21.2	93.7	44.4	44.4	16.2	35.6	NR	NR	NR	53.7	NR	NR	NR	NR	NR	NR	NR	NR
Conway 2014 (34)	57	68.6	NR	94.2	NR	NR	12.8	25.6	33.7	100	0	87.2	43	NR	41.9	7	NR	47	NR	55
Conway 2022 (35)	75±11.85	80	24	84	21	NR	NR	NR	8	NR	NR	24	NR	NR	NR	NR	NR	NR	NR	NR
Coselli 2016 (36)	67	61.7	7.9	84.8	79.1	37.2	3	36.7	25.9	35.8	8.3	44.8	44.7	58.4	1.5	NR	NR	48	NR	NR
Coselli 2020 (37)	65±12.6	64.5	6.4	86.5	77.3	31.1	39.6	30.3	17.5	50.6	5.4	62.7	83.1	64.3	2	NR	15	67±20	NR	86.1
Da Rocha 2010 (38)	71.1	40	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Davidovic 2011 (39)	64.4	90.7	NR	NR	NR	NR	NR	67.8	2.5	5.9	NR	NR	8.8	NR	NR	NR	11.7	68.1±19.2	NR	NR
Diamond 2021 (40)	72±9.1	55	10	98	86	38	4.6	40	22	11	NR	82	NR	NR	NR	NR	NR	NR	NR	NR
Dias 2015 (41)	68	73.7	18.1	84.7	44.4	33.3	41.7	43.1	56.9	NR	NR	88.9	NR	NR	NR	NR	NR	NR	NR	NR
Dick 2008 (42)	68.8±10.1	43	8	41	26	18	12	11	16	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dick 2008 (42)	61.6±15.2	59	3	53	40	34	NR	12	NR	NR	NR	36	NR	NR	45	NR	NR	NR	NR	83
Ding 2018 (43)	54.0±11.0	88.6	7.5	81.8	30.2	15.7	11.9	2.5	1.3	100	63.5	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dong 2022 (44)	38.3±9.8	67.2	1.6	42.9	NR	2.2	NR	NR	60.7	NR	NR	80.9	NR	NR	NR	NR	NR	NR	NR	84.7
Du 2019 (45)	51.1±10.8	83.4	4.3	74.8	31.9	14.7	7.4	NR	0	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Dua 2019	72.8	52	NR	NR	NR	NR	NR	NR	NR	14	NR	100	NR	NR	NR	NR	NR	NR	NR	NR
Duan 2016 (46)	36.1±12.0	71.4	NR	50	NR	NR	NR	NR	57.1	85.7	NR	100	NR	NR	NR	NR	NR	17.5±4.4	5.9±1.3	NR
Dufour 2015 (47)	60.0±18.0	77	8.1	37.8	51.3	NR	NR	9.5	NR	17.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Eagleton 2016 (48)	73.5±8.4	76.3	14.7	NR	91.9	43.8	18.6	30.8	43.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Estrera 2015 (49)	64.2±13.8	0.6	NR	83	78.9	27.4	NR	714	5.9	35.2	81	83.3	93.1	NR	NR	NR	NR	46.9±25.7	NR	20
Faure 2018 (50)	61	82.9	NR	65.8	NR	NR	NR	NR	21.9	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fernandez 2016 (51)	73.0±8.0	75.2	11.3	94.7	90.2	NR	3	NR	NR	6.8	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ferreira 2008 (52)	72	13	NR	NR	NR	4	NR	3	4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fioranelli 2011 (53)	58.8±11.4	78.3	13	100	65.2	17.4	13	4.3	NR	100	43.5	NR	NR	NR	NR	NR	NR	NR	NR	NR
Forsythe 2022 (54)	70±6.66	78.2	13.7	72.6	85.1	36.7	NR	24.2	NR	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Fossaceca 2013 (55)	71	84.9	56.6	71.6	56.6	50.9	9.4	56.6	NR	3.8	NR	35.8	NR	NR	NR	NR	NR	NR	NR	NR
Frankel 2020 (56)	42±14	59	6	21	32	7	NR	NR	5	65	5	56	41	45	16	NR	NR	NR	NR	NR
Fujikawa 2018 (57)	69.0±21.8	72.6	5.9	73.2	57.1	17.9	12	25	58.9	63.1	4.8	NR	88.6	NR	9	NR	NR	95.0±45.8	NR	NR
Fujiyoshi 2019 (58)	64±45.92	81.2	8.7	84	NR	24.6	5.8	11.6	55.1	NR	NR	68.1	0	NR	100	NR	NR	NR	NR	NR
Fukui 2016 (59)	65.6±14.4	65.9	9.1	95.5	65.9	NR	6.8	4.5	59.1	40.9	NR	72.7	NR	NR	40.9	100	NR	NR	NR	NR
Fukushima 2020 (60)	77.6±7.4	75	6.3	87.5	NR	18.9	25	31.3	25	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gallitto 2017 (61)	73.0±6.0	90	20	100	30	40	40	40	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gallitto 2022 (62)	73±7	77	12	98	65	37	47	40	52	NR	NR	88	NR	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Gallitto 2022 (63)	73±7	71	11	100	NR	32	52	42	48	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gambardella 2021 (64)	68±18	54.3	10.1	95.9	71.3	NR	0.272	NR	NR	NR	NR	NR	0.284	NR	7.9	NR	64	33	360	41.4
Garbade 2010 (65)	65	69.6	19.6	87	NR	NR	NR	19.5	13	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gillen 2015 (66)	67	74	10	84.7	NR	62	27	35	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gillen 2015 (66)	58	14	0	24	NR	7	5	5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Girardi 2019 (67)	64.7±14.6	59	9.2	96	76	NR	25.3	40.4	NR	42.5	8	84.8	0.272	NR	8.3	NR	64.5	65	318	40.6
Gocze 2018 (68)	70.1	72.2	16.7	88.9	61.1	50	0	NR	NR	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gombert 2017 (69)	70.5±6.2	73.9	17.4	87	52.2	34.8	21.7	NR	NR	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gombert 2018 (70)	55.2±14.2	69.7	NR	79.5	61.7	25.9	13.5	13.5	19.7	0	0	100	NR	NR	NR	NR	NR	NR	NR	NR
Gombert 2020 (71)	50.1±16.4	42.8	14.3	57	28.6	28.6	21.4	14.3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	35	NR
Gombert 2020 (71)	72.5±7.1	52.6	21	79	42.1	52.6	10.5	57.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Gombert 2022 (72)	56.2±13	73	9	83	38	29	53	29	51	58	NR	NR	NR	NR	NR	NR	NR	NR	92	36
Grassi 2022 (73)	70±11	58.1	19.2	88	56.9	29.3	20.8	25.7	19	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0
Guangqi 2009 (74)	56.7	91.7	NR	97.5	NR	NR	4.1	NR	NR	100	59.5	NR	NR	NR	NR	NR	NR	NR	NR	NR
Guo 2015 (75)	57.4	74.5	23.4	83	44.7	NR	NR	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Harky 2021 (76)	63.26±15.11	66	5.5	59.7	17.9	NR	NR	15.5	33	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
He 2015 (77)	42.8	82.4	8.1	97.3	NR	12.8	6.1	9.5	14.2	100	100	100	NR	NR	NR	NR	NR	NR	NR	NR
He 2017 (78)	54.1	79.9	4.4	86.9	61.1	35.8	NR	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Heijmen 2012 (79)	64.6±12.0	81	11	84	55	20	19	18	9	42	0.2	NR	NR	NR	NR	NR	NR	NR	NR	NR
Henmi 2019 (80)	60.3	74.4	9.9	83.1	50.6	NR	56.4	19.2	26.2	61	NR	9.2	NR	NR	17.4	NR	NR	NR	475	NR
Hicks 2017 (81)	62.1±1.3	64.2	5.8	81	65.7	20.4	10.2	19.7	45.6	24.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Hiraoka 2018 (82)	72.1±9.9	74.9	13.7	92	8.5	NR	2.3	12	43.4	36.6	NR	31.4	NR	NR	NR	NR	NR	NR	NR	NR
Hnath 2008 (83)	60.6	51.1	NR	77.9	NR	41.9	17.5	33.1	33.9	NR	NR	46.3	NR	NR	NR	NR	NR	NR	NR	NR
Hoshina 2021 (84)	75.2±8.3	75.9	NR	72.8		15.4	3.4	22.1	12.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Huang 2016 (85)	73.5	70.4	3.7	66.7	NR	NR	3.7	7.4	NR	100	92.6	NR	NR	NR	NR	NR	NR	NR	NR	NR
Inglese 2008 (86)	69.3±9.7	80.5	12.2	100	70.7	31.7	41.5	51.2	NR	14.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Jayia 2015 (87)	72.1	68.1	10.6	80.8	23.4	36.2	19.1	NR	21.3	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR
Jing 2008 (88)	86.6	68.4	20.9	77.6	62.7	13.4	9	9	NR	100	47.8	NR	NR	NR	NR	NR	NR	NR	NR	NR
Johns 2014 (89)	56	83.8	2.7	NR	83.8	29.7	13.5	16.2	NR	27	0	54.1	54	NR	NR	NR	NR	NR	NR	NR
Jorgensen 2020 (90)	NR	77.3	13.6	88.6	95.5	54.5	6.8	50	45.5	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0
Juszczak 2020 (91)	73±25.6	68.5	7.4	68.5	NR	33.3	24	25.9	48.1	4	0	NR	NR	NR	NR	NR	NR	NR	0	0
Kamada 2015 (92)	72.0±10.6	74.5	11.8	86.3	NR	NR	NR	NR	37.3	21.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kang 2019 (93)	74.9±7.6	75	NR	NR	NR	NR	NR	NR	44.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Kang 2019 (93)	62±20.4	66.7	NR	NR	NR	NR	NR	NR	38.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kasprzak 2014 (94)	72.6	66.3	NR	92.8	62.6	51.8	31.3	28.9	33.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Katsargyris 2015 (95)	68.8±7.5	76.6	8.5	80.6	63.7	62.7	8	53.2	NR	NR	NR	71.6	NR	NR	NR	NR	NR	NR	NR	NR
Katsargyris 2021 (96)	67.5±6.9	60	6.7	93.3	NR	46.7	NR	50	23.3	NR	NR	50	NR	NR	NR	NR	NR	NR	NR	NR
Kieffer 2008 (97)	65.0±10.9	87.1	13	121	NR	72	58	81	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kinoshita 2015 (98)	58.9±12.6	92.3	NR	NR	NR	NR	NR	NR	NR	100	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kiser 2022 (99)	67.66±13.1	63	NR	88	NR	27	6	39	22	37	4	NR	100	NR	0	NR	NR	NR	NR	NR
Kitamura 2013 (100)	55.5±13.1	94.3	NR	NR	NR	NR	7.5	NR	20.8	100	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kitpanit 2021 (101)	75.67±7.7	NR	9.4	87.7	22.6	43.3	36.8	21.7	50.9	NR	NR	73.6	NR	NR	NR	NR	NR	NR	NR	NR
Kouchoukos 2019 (102)	64	NR	6	77.2	54.4	37.8	NR	38.6	NR	26.4	1.1	39.3	NR	NR	NR	NR	NR	NR	NR	46.3
Kratimenos 2018 (103)	73.7±6.3	80	16.7	56.7	70	26.7	13.3	23.3	3.3	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kulik 2011 (104)	63.0±14.0	49.5	6	76.6	62.8	39.9	13.8	40.8	73.4	25.2	1.4	25.2	NR	NR	100	NR	NR	NR	NR	56
Kunihara 2009 (105)	64.0±15.0	58.8	NR	NR	NR	NR	1	NR	8	7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Kunihara 2021 (106)	68	66.4	10.4	88.5	NR	46.7	27.5	33	56.6	29.7	NR	62.1	NR	34.6	NR	NR	NR	53±111.1	NR	64.8
Kurimoto 2008 (107)	71.6	90	NR	NR	NR	NR	NR	NR	NR	20	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lancaster 2013 (108)	69.8	45.2	8.4	89	81.5	41.9	10	21	NR	21.3	NR	100	29.4	NR	NR	NR	79.4	78.6	NR	53
Latz 2021(109)	73.4±7.4	63.6	11.1	85.4	82	46.1	15.3	24.7	29.9	3	NR	NR	NR	86	NR	NR	NR	77.27±19	NR	NR
Le Huu 2022 (110)	46.5	54.1	2.7	83.8	35.1	16.2	13.5	21.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lee 2012 (111)	62.6±12.8	28.6	7.1	85.7	60.7	28.6	NR	NR	NR	39.3	17.9	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lee 2015 (112)	65.5±12.9	76.3	8.8	73.7	40.4	11.4	33	NR	NR	47.4	NR	58.8	NR	NR	NR	NR	NR	NR	NR	NR
Lee 2015 (112)	60.1±15.9	69.8	13.2	75.5	30.2	13.2	15.1	NR	NR	28.3	NR	79.2	37.7	NR	58.5	NR	NR	NR	NR	NR
Li 2015 (113)	53.1±10.5	84.8	3.8	74.2	NR	4.3	1.2	0.5	NR	100	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Li 2018 (114)	52.5±10.8	85.1	NR	NR	NR	NR	NR	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lima 2012 (115)	62	37	NR	89.4	NR	NR	8.8	37	NR	47.3	1.8	93.2	NR	NR	NR	NR	NR	NR	NR	NR
Lima 2022 (116)	73.8±8.3	65	16	89	70	33	53	28	35	16	NR	53.9	NR	NR	NR	NR	NR	NR	NR	NR
Lindstrom 2020 (117)	72.9±5.1	41.2	11.8	64.7	NR	11.8	NR	52.9	NR	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR
Liu 2011 (118)	58.9±12.7	88.2	5.9	86.3	41.2	5.9	11.8	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Liu 2017 (119)	56.1±12.9	83.9	6.5	74.2	NR	6.8	4.7	3.4	0	100	26.7	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lobato 2012 (120)	NR	NR	NR	NR	NR	NR	NR	NR	20	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Locham 2018 (121)	66.5±10.9	58.8	14.3	80.7	56.8	NR	20.6	44.7	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Locham 2018 (121)	71.2±10	52.2	15.8	87.1	56.8	NR	20.4	43.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lortz 2018 (122)	64.3	44.4	15.6	88.9	48.9	37.8	28.9	NR	17.8	100	71.1	NR	NR	NR	NR	NR	NR	NR	NR	NR
Lou 2018 (123)	39.4	58.2	8.5	67.2	29.1	NR	3.7	8.5	NR	100	100	100	NR	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Lou 2018 (123)	53.4±10.9	76.3	8.8	98.3	44.1	NR	5.1	11.9	NR	100	100	100	57.6	NR	42.4	NR	NR	NR	NR	NR
Lucatelli 2018 (124)	71.3±9.5	69.4	14.3	73.5	75.5	NR	20.4	NR	42.9	10.2	0	22.4	NR	NR	NR	NR	NR	NR	NR	NR
Malas 2021 (125)	73.5±7.2	69	18	96	84	56	27	31	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Manning 2009 (126)	67	73.1	NR	NR	NR	NR	NR	NR	NR	100	98.1	NR	NR	NR	NR	NR	NR	NR	NR	NR
Marcondes 2022 (127)	71±9	66	14	81	57	38	41	37	75	14	NR	4	NR	NR	NR	NR	NR	NR	NR	NR
Martin 2009 (128)	66.2±15.2	67.4	NR	NR	NR	NR	NR	NR	NR	21.1	NR	11.9	NR	NR	NR	NR	NR	NR	NR	NR
Marzelle 2015 (129)	68.4±10.7	81	9.5	83.3	NR	31	42.9	35.7	57.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mastroroberto 2010 (130)	74.3±8.4	53.8	7.7	76.9	NR	7.7	NR	61.6	7.7	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mastroroberto 2010 (130)	70.2±7.8	72.7	18.2	81.8	NR	9.1	NR	63.6	9.1	100	100	100	0	NR	NR	NR	NR	NR	NR	NR
Mazzeffi 2018 (131)	68	60.8	16.7	90.3	39.8	16.7	6.9	14.7	29.4	29.4	NR	100	NR	NR	NR	NR	NR	NR	NR	NR
Meltzer 2017 (132)	75.1±8.9	77.3	18.2	90.9	81.8	NR	18.2	13.6	45.5	4.5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Messe 2008 (133)	65.5±14.0	54.5	7.6	81.7	32.6	26.3	23.7	31.7	40.6	30.8	NR	82.1	75	NR	30.8	NR	NR	73.0±31.0	NR	34
Mezzetto 2021 (134)	74.9±7.4	89.1	15.5	66.6		31.7	13.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Min 2010 (135)	50.7±15.2	72.7	6.1	NR	NR	12.1	3	15.2	33.3	69.7	0	100	0	NR	0	NR	NR	NR	DTA 1.0 (0–4), TAAA 2.3 (0–7)	NR
Mishra 2008 (136)	62	71.4	7.1	92.9	NR	21.4	21.4	42.9	NR	21.4	0	NR	NR	NR	14.3	NR	64.3	NR	NR	NR
Mitchell 2011 (137)	49	59.1	NR	NR	NR	NR	NR	NR	NR	9.1	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mizoguchi 2017 (138)	65	78.9	NR	100	76.3	15.8	21.1	18.4	NR	100	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mkalaluh 2018 (139)	54.4±13.4	42.1	2.6	78.9	44.7	2.6	23.7	NR	65.8	63.2	0	100	0	NR	15.8	NR	NR	NR	2.0 ±1.1	60.5
Monaco 2018 (140)	65.7	73.2	6.8	74.7	43.6	7	12.2	16.1	35.3	0	0	NR	74.3	NR	NR	NR	NR	52.9	NR	NR
Monnot 2018 (141)	68.9±10.4	83.3	16.7	66.7	61.1	22.2	27.8	50	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Monnot 2018 (141)	66.3±6.7	81	28.6	85.7	85.7	19	23.8	28.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Mosquera 2009 (142)	63.5±13.6	75	NR	65	NR	15	10	10	10	40	30	NR	NR	NR	NR	NR	NR	NR	NR	NR
Motta 2019 (143)	72±8	72	19	92	95	53	42	59	35	NR	NR	35	NR	NR	NR	NR	NR	NR	NR	NR
Motta 2019 (144)	71	69	17	91	93	51	43	58	NR	9	NR	51	NR	NR	NR	NR	NR	NR	NR	NR
Moulakakis 2015 (145)	68.8±5.9	93.3	NR	76.7	60	30	NR	53.3	NR	NR	NR	13.3	NR	NR	NR	NR	NR	NR	NR	NR
Muncan 2022 (146)	39.2±15.3	47.8	5	48.5	NR	NR	5	NR	5	42.8	NR	5.6	NR	NR	NR	NR	NR	NR	NR	NR
Muncan 2022 (146)	48.7±13.9	58.7	18.1	80	NR	NR	18.1	NR	23.6	77.8	NR	18.5	NR	NR	NR	NR	NR	NR	NR	NR
Murana 2016 (147)	65.0±10.5	53.9	5.5	90.4	NR	NR	8.9	21	57.9	29.5	0	86.7	87.3	NR	12.7	76.2	NR	NR	NR	NR
Naguib 2016 (148)	58.8±14.0	75.5	NR	62.3	NR	NR	NR	NR	NR	47.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Narayan 2011 (149)	57.5	69.4	2	46.9	46.9	NR	12.2	8.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Naughton 2012 (150)	66.7±14.9	58.3	16.7	8.3	50	NR	NR	12.5	33.3	NR	NR	29.2	100	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Neo 2011 (151)	64.3	77.8	5.6	66.7	NR	16.7	5.6	5.6	NR	11.1	NR	0	NR	NR	NR	NR	NR	NR	NR	NR
Nomura 2015 (152)	76.2±7.9	74.1	25.9	85.2	66.7	9.3	24.1	24.1	16.7	NR	NR	44.4	NR	NR	NR	NR	NR	NR	NR	NR
Ockert 2009 (153)	62.1	70	NR	83.3	50	53.3	36.7	23.3	NR	NR	NR	0	NR	NR	NR	NR	NR	NR	NR	13.3
Oderich 2017 (154)	75.0±7.0	72.4	16.8	88.6	85.9	60.5	32.4	47.6	37.3	NR	NR	79.5	NR	NR	NR	NR	NR	NR	NR	NR
Oderich 2021 (155)	73.9±8	68.3	14.1	90.9	79.4	48.1	46.8	30.3	NR	12.7	NR	62.9	NR	NR	NR	NR	NR	NR	NR	NR
Omura 2014 (156)	63.0±15.0	72.2	11.3	80.9	56.5	NR	10.4	8.7	23.5	53.9	NR	82.6	NR	NR	32.1	NR	NR	NR	3.0±1.4	100
Omura 2017 (157)	55.0±16.0	69.1	NR	NR	NR	NR	3.1	13	20.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.5	57.4
Orrico 2019 (158)	69.9±19.9	75	25	87	66	NR	3	44	NR	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR
Pacini 2013 (159)	64.6±14.6	74.2	4.3	72	NR	3.2	7.5	21.5	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Patel 2009 (160)	57.3±12.1	78.2	13	82.6	NR	13	43.4	15.9	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pearce 2008 (161)	61.0±11.5	80	NR	100	NR	NR	NR	NR	NR	NR	NR	2	NR	NR	NR	NR	NR	NR	NR	NR
Peidro 2018 (162)	54.0±22.0	76.3	NR	NR	NR	NR	NR	NR	NR	34.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Piffaretti 2015 (163)	62.5	71.4	23.2	NR	NR	28.6	14.3	28.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Piscione 2007 (164)	58.4±17.8	84.8	NR	NR	NR	36.4	18.2	NR	NR	51.5	51.5	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pitton 2008 (165)	58.9	40.9	NR	NR	NR	NR	NR	NR	NR	59.1	9.1	NR	NR	NR	NR	NR	NR	NR	NR	NR
Pompa 2016 (166)	47.4±5.1	67.9	NR	71.4	NR	NR	NR	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Qing 2012 (167)	56.4	NR	NR	NR	NR	NR	NR	NR	NR	100	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rahe.Meyer 2009 (168)	56.9	66.7	11.1	72.2	NR	16.7	5.6	44.4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rajbanshi 2015 (169)	72.3±7.5	65.1	19.7	89.4	37.9	78.8	21.2	31.8	66.7	4.5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rana 2018 (170)	69.0±11.0	68.6	NR	78.5	82.6	58.7	29.7	NR	NR	NR	NR	82.6	25.6	72.7	0	NR	53.7	NR	NR	54
Ranney 2018 (171)	71.1±10.4	55.8	21.9	91.7	67.2	38.5	20.3	32.8	41.1	0	0	12.5	NR	NR	NR	NR	NR	NR	NR	NR
Raupach 2013 (172)	59.8	73.6	NR	NR	NR	NR	NR	NR	NR	31.9	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rinaldi 2022 (173)	73±7	78.6	25.4	96.3	72.1	48.1	34.8	60.7	NR	10.5	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rhee 2022 (174)	40	75	NR	35	NR	NR	15	NR	90	80	NR	100	100	NR	100	NR	NR	NR	NR	NR
Rocha 2021 (175)	71.3±9.4	74.5	26.4	88.4	NR	23.1	13.2	41.6	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rocha 2021 (175)	67.5±11.2	67.7	24.1	87.5	NR	26.6	15.5	38.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rodriguez 2008 (176)	55	70	7.5	100	58.5	35.8	19.8	45.3	NR	44.3	36.8	1.9	NR	NR	NR	NR	NR	NR	NR	NR
Rossi 2015 (177)	73	75.4	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Rylski 2013 (178)	NR	NR	NR	NR	NR	NR	NR	NR	NR	0	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Saiki 2019 (179)	58.3±11.5	72	NR	NR	NR	NR	NR	NR	NR	76	NR	100	NR	NR	NR	NR	NR	NR	2.0±1.2	100
Scali 2020 (180)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Schneider 2018 (181)	75.6±7.5	76	8	92	84	48	54	20	48	6	NR	86	NR	NR	NR	NR	NR	NR	NR	NR
Seike 2021 (182)	76±7.4	78.7	NR	NR	38.2	41.2	20.6	11.8	72.7	NR	NR	33.1	NR	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)																				
Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Seike 2022 (183)	76.5	77	NR	NR	42.1	NR	22.5	NR	30.4	NR	NR	43.6	NR	NR	NR	NR	NR	NR	NR	NR
Shah 2010 (184)	65.4	100	23.3	56.7	63.3	30	13.3	33.3	NR	3.3	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Shimizu 2014 (185)	63.8	73	8.1	NR	NR	13.5	NR	10.8	43.2	62.2	NR	83.8	NR	59.5	NR	97.3	NR	142.0±69.0	NR	75.7
Shiraeve 2016 (186)	55.9±17.2	58.33	0	58.3	66.7	25	NR	NR	8.3	NR	NR	50	NR	NR	NR	NR	NR	NR	NR	NR
Shu 2011 (187)	42.6	73.3	17.8	22.2	NR	13.3	15.6	13.3	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Si 2014 (188)	55.8	85.7	5.4	78.6	30.4	3.6	14.3	16.1	NR	85.7	NR	0	NR	NR	NR	NR	NR	NR	NR	NR
Smith 2022 (189)	71.76±9	65.3	16.2	90	NR	27.6	2.8	40.9	43.1	NR	NR	49.8	NR	NR	NR	NR	NR	NR	NR	NR
Song 2016 (190)	53.9±12.7	81.5	8.1	78.5	41.2	1.5	5.9	NR	NR	100	41.5	1.5	NR	NR	NR	NR	NR	NR	NR	NR
Spanos 2018 (191)	73.3±7.0	61.9	7.1	78.6	38.1	30.9	35.7	23.8	47.6	4.8	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Spanos 2019 (192)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Spear 2018 (193)	61.5	90.9	4.5	95.4	NR	9.1	9.1	13.6	86.4	100	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Spinella 2020 (194)	76.5	90.9	0.09	100	NR	63	27	54	45	NR	NR	100	NR	NR	NR	NR	NR	NR	NR	NR
Steingruber 2008 (195)	64	77.1	NR	NR	NR	NR	NR	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Stelzmueller 2019 (196)	52.0±13.0	72.7	5.5	78.2	NR	5.5	5.5	5.5	7.3	100	100	0	NR	NR	NR	NR	NR	NR	NR	NR
Sugiura 2017 (197)	63	72.9	NR	79.7	NR	NR	31.4	8.5	34.7	52.5	NR	66.1	NR	NR	NR	NR	NR	NR	NR	CSFD group: 2.1±2.4, No CSFD group: 1.2±2.1
Sultan 2018 (198)	63.8	81.8	NR	81.8	60.6	NR	3	NR	18.2	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Sweet 2015 (199)	73	75	12.5	91.7	50	54.2	29.2	41.7	50	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tabayashi 2010 (200)	63	74.5	NR	NR	NR	NR	NR	NR	NR	NR	NR	100	56.9	NR	NR	NR	NR	NR	NR	No SCI group (n=98): 2.6±1.6 SCI group (n=4): 3.7±1.5
Takahashi 2011 (201)	72.7±7.6	73.3	20	86.7	26.7	26.7	13.3	6.7	10.8	26.7	NR	100	NR	NR	NR	NR	NR	77.0±31.0	NR	20
Tanaka 2018 (202)	75	46.6	9.1	96.6	75	45.5	38.6	56.8	46.6	12.5	0	78.4	NR	NR	NR	NR	NR	NR	NR	NR
Tanaka 2019 (203)	71±9.63	63	NR	86	83	31	NR	42	49	30	4	100	NR	NR	NR	100	NR	40±20.74	NR	NR
Tanaka 2019 (203)	39±11.1	67	NR	71	51	7	NR	9	65	68	4	100	NR	NR	NR	100	NR	44±29.62	NR	NR
Tang 2011 (204)	64.0±19.0	76.7	23.3	80	66.7	30	3.3	13.3	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Tenorio 2020 (205)	72±9	57	13	95	73	42	45	45	71	20	NR	92	NR	NR	NR	NR	NR	NR	NR	NR
Thomas 2018 (206)	73.7	72.7	13.6	95.5	40.9	NR	NR	NR	NR	40.9	31.8	0	NR	NR	NR	NR	NR	NR	NR	NR
Tong 2022 (207)	66±11	62	11	91	NR	18	NR	36	NR	NR	NR	61	NR	NR	NR	NR	NR	NR	NR	NR
Tong 2022 (207)	66±13	63	10	89	NR	22	NR	36	NR	NR	NR	62	NR	NR	NR	NR	NR	NR	NR	NR
Trimarchi 2010 (208)	60	88.9	NR	NR	NR	NR	NR	NR	NR	100	100	NR	0	NR	0	NR	100	NR	NR	NR
Tsilimparis 2018 (209)	72.7±9.9	61.7	NR	86.9	81.9	35.5	1.8	35.7	NR	NR	NR	40.1	NR	NR	NR	NR	NR	NR	NR	NR

Table S3 (continued)

Table S3 (continued)

Study	Age	Male (%)	Diabetes (%)	HTN (%)	Smoking history (%)	Preop CAD (%)	CRF (%)	COPD (%)	Previous aortic surgery (%)	Dissection (%)	Acute dissection (%)	CSF drain use (%)	Left Heart Bypass (%)	Selective renal perfusion (%)	Circulatory arrest (%)	Sequential Cross Clamp (%)	Clamp & Sew (%)	Mean Cross clamp time (minutes) ± st dev	Number of intercostals implanted	% of patients undergoing reimplantation
Ullery 2012 (210)	71.3	59.4	18.5	97.7	47.9	44.3	11.3	24	NR	15.3	15.3	NR	NR	NR	NR	NR	NR	NR	NR	NR
Umegaki 2022 (211)	73±10.6	74.2	NR	NR	NR	NR	NR	NR	NR	28.8	NR	6.3	NR	NR	NR	NR	NR	NR	NR	NR
Umegaki 2022 (211)	65±12.6	76.7	NR	NR	NR	NR	NR	NR	NR	44.7	NR	16.3	NR	NR	NR	NR	NR	NR	NR	NR
Vaislic 2014 (212)	75.8±10.8	82.6	8.7	87	65.2	26.1	30.4	NR	65.2	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
van Bogerijen 2015 (213)	56.4±12.8	77.8	8.9	90	62.2	12.2	NR	2.2	31.1	83.3	0	86.7	21.1	NR	77.8	NR	NR	75	NR	NR
Van Calster 2019 (214)	71.6±8.89	94.2	19.8	NR	87.3	44.7	23.9	36.7	NR	NR	NR	52.8	NR	NR	NR	NR	NR	NR	NR	NR
Wahlgren 2017 (215)	60	78.9	NR	83.3	52.2	10	4.4	8.9	57.8	NR	NR	76.7	63.3	NR	36.7	NR	NR	NR	LHB group: 2.7, HCA group: 1.4	LHB group: 56, HCA group: 45
Watson 2010 (216)	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	100	NR	100	NR	NR	NR	NR	NR	NR
Weiss 2012 (217)	62.6±13.2	55.8	NR	NR	62.9	NR	10	16.3	37.9	40	3.8	80	NR	NR	32.1	NR	NR	46	NR	NR
Wojciechowski 2014 (218)	72.0±14.4	72.2	12.5	62.5	NR	18.1	8.3	NR	9.7	11.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Wongkornrat 2015 (219)	65.1±12.0	73.5	NR	NR	NR	NR	8	NR	26	50.5	NR	82	100	61.5	NR	38	NR	78.8	NR	38
Wynn 2016 (220)	70	57.9	NR	NR	NR	NR	NR	NR	29.2	10.6	NR	75.7	NR	NR	4.7	NR	95.3	NR	NR	32.9
Xiong 2013 (221)	52.8±13.1	88.5	NR	NR	NR	NR	NR	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Yaffee 2015 (222)	60.7±14.0	64.4	9.8	NR	NR	3	5.3	12.1	NR	29.5	16.7	NR	NR	NR	NR	NR	NR	101.9	NR	NR
Yang 2018 (223)	44.0±15.0	86.4	6.3	85.2	NR	NR	NR	NR	NR	100	81.4	NR	NR	NR	NR	NR	NR	NR	NR	NR
Yang 2020 (224)	74.4±8.7	85	11	80	85	13	3	NR	NR	NR	NR	60	NR	NR	NR	NR	NR	NR	NR	NR
Yokawa 2020 (225)	62.6±14	72.1	9.6	82.5	NR	19.5	54.6	18.2	45	NR	NR	81.5	100	NR	12.7	NR	NR	NR	192	76.5
Yoo 2014 (226)	53.5	76.9	6.1	51.9	NR	2.8	NR	NR	NR	46.2	9	59.4	2.4	NR	37.3	NR	NR	NR	NR	NR
Youssef 2015 (227)	66.0±10.0	64.5	4.8	98.4	77.4	25.8	22.6	NR	22.6	27.4	NR	56.5	17.7	NR	NR	NR	NR	NR	NR	NR
Youssef 2018 (228)	72	60	30	96.7	73.3	40	NR	20	50	10	0	80	NR	NR	NR	NR	NR	NR	NR	NR
Yunoki 2014 (229)	74.8±10.0	66.7	NR	94.4	NR	44.4	13.9	13.9	27.8	NR	NR	75	NR	NR	NR	NR	NR	NR	NR	NR
Yuri 2012 (230)	70.1±14.1	83.3	13.3	40	NR	NR	10	20	NR	NR	0	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zamor 2015 (231)	59.9	70	16.3	78.8	53.8	30	26.3	11.3	NR	40	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zanetti 2015 (232)	62	74.5	NR	78.4	68.6	15.7	19.6	29.4	NR	45.1	NR	11.8	51	NR	19.6	NR	13.7	53.5	1.33	NR
Zeng 2016 (233)	51.0±13.0	74	NR	80.9	42.7	NR	0	NR	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zeng 2021 (234)	56.3±14.6	90	10	80	70	NR	10	NR	20	10	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zha 2018 (235)	54.9	77.3	NR	NR	NR	NR	NR	NR	NR	100	36.4	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zhang 2017 (236)	63.9	69.4	12.9	83.5	54.1	NR	4.7	3.5	NR	100	70.6	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zhao 2018 (237)	52.1	91.2	7.4	82.4	NR	2.9	4.4	NR	NR	100	7.4	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zhou 2018 (238)	57.0±11.0	81.6	2.6	86.8	NR	13.2	NR	NR	NR	100	57.9	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zhou 2018 (238)	49.7±11.6	93.9	7.6	69.7	69.7	6.1	NR	0	NR	100	68.2	NR	NR	NR	NR	NR	NR	NR	NR	NR
Zhu 2018 (239)	53	80	5	90	NR	35	15	10	NR	100	100	NR	NR	NR	NR	NR	NR	NR	NR	NR

HTN, hypertension; CAD, coronary artery disease; CVA, cerebrovascular accident; CRF, chronic renal failure; COPD, chronic obstructive pulmonary disease; CSF, cerebrospinal fluid; HCA, hypothermic circulatory arrest; LHB, left heart bypass; NR, not reported.

Table S4 Proportion of studies that reported preoperative, intraoperative, and postoperative variables of interest

Variable	Reported endovascular repair (%)	Reported open repair (%)
Gender	94.7	96.4
Diabetes	73.1	67.9
Hypertension	80.1	79.8
Smoking	55	54.8
Coronary artery disease	65.5	64.3
Chronic renal failure	70.2	67.9
Chronic obstructive pulmonary disease	63.2	72.6
Aortic dissection	50.9	59.5
Cerebrospinal fluid drain use	36.3	67.9
Left heart bypass	NA	45.2
Renal perfusion	NA	10.7
Circulatory arrest	NA	39.3
Postoperative cerebrovascular accident	70.8	73.8
Follow-up mortality	66.7	54.8

NA, not applicable.

Table S5 Summary of critical appraisal of included observational studies using the Newcastle-Ottawa Quality Assessment Scale

Author	Selection	Comparability	Outcome
Abdelbaky 2021	****	**	***
Abisi 2021	***	**	**
Acher 2019	***	**	***
Adam 2022	***	**	***
Afifi 2015	****	**	**
Al Adas 2018	***	*	***
Albors 2009	***	*	**
Alhussaini 2021	***	*	**
Andacheh 2011	***	**	***
Andersen 2014	****	*	***
Anderson 2014	****	**	***
Arnaoutakis 2015	****	**	***
Arnaoutakis 2020	****	**	***
Baba 2017	***	*	***
Bannazadeh 2020	***	**	***
Barbosa Lima 2021	***	**	***
Bashir 2014	****	*	***
Belov 2009	***	*	**
Bertoglio 2018	***	*	**
Bertoglio 2020	***	*	***
Bertoglio 2021	***	**	**
Bisdas 2015	****	*	**
Bockler 2009	***	*	**
Bosiers 2021	***	**	***
Botsios 2014	***	*	**
Branzan 2018	***	**	**
Canaud 2018	****	*	***
Chatterjee 2021	***	**	***
Chen 2013	****	**	***
Chen 2017	****	*	**
Clough 2012	****	*	***
Clough 2018	****	**	***
Conrad 2017	****	**	***

Table S5 (continued)

Table S5 (continued)

Author	Selection	Comparability	Outcome
Conway 2014	****	**	***
Conway 2022	***	**	***
Coselli 2016	****	**	***
Da Rocha 2010	****	*	**
Davidovic 2011	****	*	**
Diamond 2021	***	*	**
Dias 2015	****	**	***
Dick 2008	****	**	***
Ding 2018	****	*	***
Dong 2022	***	**	**
Du 2019	****	*	***
Dua 2019	***	**	***
Duan 2016	***	*	**
Dufour 2015	****	**	***
Eagleton 2016	****	**	***
Estreza 2015	****	**	***
Faure 2018	***	*	***
Fernandez 2016	****	*	***
Ferreira 2008	***	**	***
Fioranelli 2011	****	**	***
Forsythe 2022	***	**	***
Fossaceca 2013	***	*	**
Frankel 2020	**	**	***
Fujikawa 2018	****	**	***
Fujikawa 2019	***	*	***
Fujiyoshi 2019	***	**	***
Fukui 2016	****	**	***
Fukushima 2020	***	*	***
Gallitto 2017	****	*	**
Gallitto 2022	***	**	**
Gallitto 2022	***	**	***
Gambardella 2021	***	*	**
Garbade 2010	****	**	***
Gillen 2015	****	**	***

Table S5 (continued)

Table S5 (continued)			
Author	Selection	Comparability	Outcome
girardi 2019	****	**	***
Gocze 2018	****	**	***
Gombert 2017	****	**	***
Gombert 2018	****	**	***
gombert 2020	***	*	**
gombert 2022	***	**	***
grassi 2022	***	**	**
Guangqi 2009	****	*	***
Guo 2015	****	**	**
harky 2021	***	**	**
He 2015	***	*	***
He 2017	****	**	**
Heijmen 2012	****	**	**
henmi 2019	***	**	***
Hicks 2017	****	**	***
Hiraoka 2018	***	**	***
Hnath 2008	****	*	**
hoshina 2021	****	*	**
Huang 2016	****	**	**
Inglese 2008	****	**	***
Jayia 2015	****	*	***
Jing 2008	***	**	***
Johns 2014	***	*	***
jorgensen 2020	***	**	**
Juszczak 2020	***	**	**
Kamada 2015	****	**	***
Kang 2019	***	**	***
Kasprzak 2014	****	**	**
Katsargyris 2015	***	**	***
Katsargyris 2021	***	**	***
Kieffer 2008	****	*	***
Kinoshita 2015	***	*	***
Kiser 2022	****	**	***
Kitamura 2013	****	**	***

Table S5 (continued)

Table S5 (continued)			
Author	Selection	Comparability	Outcome
Kitpanit 2021	***	**	**
Kouchouk 2019	***	**	***
Kratimenos 2018	****	*	***
Kulik 2011	***	**	***
Kunihara 2009	***	*	***
Kunihara 2021	***	*	**
Kurimoto 2008	****	**	***
Lancaster 2013	***	*	***
Latz 2021	***	**	***
Le Huu 2022	***	**	***
Lee 2012	***	**	***
Lee 2015	****	*	**
Li 2015	****	**	***
Li 2018	****	**	***
Lima 2012	****	**	***
Lima 2022	***	**	***
Lindstrom 2020	***	**	***
Liu 2011	***	*	***
Liu 2017	****	**	***
Lobato 2012	***	**	***
Locham 2018	***	**	**
Lortz 2018	**	**	**
Lou 2018	***	**	**
Lucatelli 2018	***	**	**
Malas 2021	****	*	***
Manning 2009	***	**	**
Marconde 2022	***	**	***
Martin 2009	**	**	***
Mastroberto 2010	***	**	***
Mazzeffi 2018	**	**	***
Meltzer 2017	***	**	**
Messe 2008	**	*	***
Mezzetto 2021	***	**	***
Min 2010	***	**	***

Table S5 (continued)

Table S5 (continued)

Author	Selection	Comparability	Outcome
Mishra 2008	***	**	***
Mitchell 2011	****	**	**
Mizoguchi 2017	**	**	***
Mkhaluh 2018	***	**	**
Monaco 2018	****	**	***
Monnot 2018	***	**	**
Mosquera 2009	***	*	***
Motta 2019	***	*	***
Motta 2019	***	**	***
Moulakakis 2015	***	**	**
Muncan 2022	***	**	***
Murana 2016	***	**	***
Naguib 2016	**	**	***
Narayan 2011	****	**	**
Naughton 2012	**	**	***
Neo 2011	**	**	***
Nomura 2015	***	*	***
Ockert 2009	***	**	**
Oderich 2017	***	**	***
Oderich 2021	***	*	***
Omura 2014	****	*	**
Omura 2017	**	**	***
Orrico 2019	***	*	***
Pacini 2013	**	**	**
Patel 2009	***	**	***
Pearce 2008	***	*	**
Peidro 2018	***	**	***
Piffaretti 2015	***	*	**
Piscione 2007	****	*	**
Pitton 2008	**	**	**
Pompa 2016	**	**	**
Qing 2012	***	**	***
Rahe.Meyer 2009	***	**	**
Rajbanshi 2015	****	**	***

Table S5 (continued)

Table S5 (continued)

Author	Selection	Comparability	Outcome
Rana 2018	**	**	***
Raney 2018	***	*	***
Raupach 2013	***	*	***
Renaldi 2022	***	**	**
Rhee 2022	***	**	***
Rocha 2021	***	**	***
Rodriguez 2008	***	**	***
Rossi 2015	**	*	**
Rylski 2013	**	**	***
Saiki 2019	***	**	**
Scali 2020	***	**	***
Schneider 2018	***	**	**
Seike 2022	***	*	**
Shah 2010	***	**	***
Shimizu 2014	***	**	**
Shirayev 2016	****	*	***
Shu 2011	**	*	***
Si 2014	****	*	***
Smith 2022	****	**	***
Song 2016	****	**	***
Spanos 2018	**	**	***
Spanos 2019	***	**	**
Spear 2018	**	**	***
Spinella 2020	***	*	**
Steingruber 2008	***	**	**
Stelzmueller 2019	***	*	***
Sugiura 2017	***	*	**
Sultan 2018	**	**	***
Sweet 2015	**	*	***
Tabayashi 2010	***	**	***
Takahashi 2011	****	**	**
Tanaka 2018	**	**	***
Tanaka 2019	***	**	***
Tanaka 2019	***	**	***

Table S5 (continued)

<i>Table S5 (continued)</i>			
Author	Selection	Comparability	Outcome
Tang 2011	****	**	***
Tenorio 2020	***	*	***
Thomas 2018	***	**	***
Tong 2022	***	**	***
Trimarchi 2010	**	*	***
Tsilimparis 2018	***	**	***
Ullery 2012	***	*	***
Umegaki 2022	***	**	**
Vaislic 2014	**	**	***
van Bogerijen 2015	**	**	**
Van Calster 2019	***	**	***
Wahlgren 2017	**	**	***
Watson 2010	***	**	***
Weiss 2012	****	**	***
Wojciechowski 2014	**	**	***
Wongkornrat 2015	***	*	**
Wynn 2016	***	**	**
Xiong 2013	****	**	***
Yaffee 2015	***	**	**
<i>Table S5 (continued)</i>			

<i>Table S5 (continued)</i>			
Author	Selection	Comparability	Outcome
Yang 2018	****	**	***
Yang 2020	***	*	***
Yokawa 2020	***	**	***
Yoo 2014	**	**	***
Youssef 2015	***	**	***
Youssef 2018	***	*	***
Yunoki 2014	***	*	***
Yuri 2012	****	**	***
Zamor 2015	***	**	**
Zanetti 2015	****	*	**
Zeng 2016	**	*	***
Zeng 2021	***	**	**
Zha 2018	***	**	***
Zhang 2017	***	*	**
Zhao 2018	**	**	***
Zhou 2018	****	**	***
Zhu 2018	****	**	***

Table S6 The Cochrane Collaboration's tool for assessing risk of bias in randomized trials

	Random sequence generation	Allocation concealment	Blinding of participants	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias
Marzelle 2015 (129)	+	?	-	-	+	+	?
	+	Low risk					
	?	Uncertain					
	-	High risk					

Table S7 Pooled rates of CSF drain use related complication					
Outcomes	Studies	Patient number	Effect estimate % [95% CI (%)]	Heterogeneity (I ² , P value)	P _{interaction}
Severe complications	13	986	1.95 [0.75; 4.67]	69.00, P<0.001	–
Endovascular	9	662	3.02 [1.96; 4.64]	36.4%	0.97
Open	4	324	1.85 [0.83; 4.06]	0.0%	0.97
Moderate complications	13	986	0.38 [0.03; 3.97]	40.0%, P=0.07	–
Endovascular	9	662	0.29 [0.02; 4.13]	0.0%	0.28
Open	4	324	2.28 [0.15; 26.11]	37.0%	0.28
Minor complications	13	986	1.81 [0.57; 5.56]	30.0%, P=0.14	–
Endovascular	9	662	0.84 [0.10; 6.50]	67.0%	0.12
Open	4	324	4.56 [2.58; 7.94]	8.0%	0.12

CSF, cerebrospinal fluid.

References

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