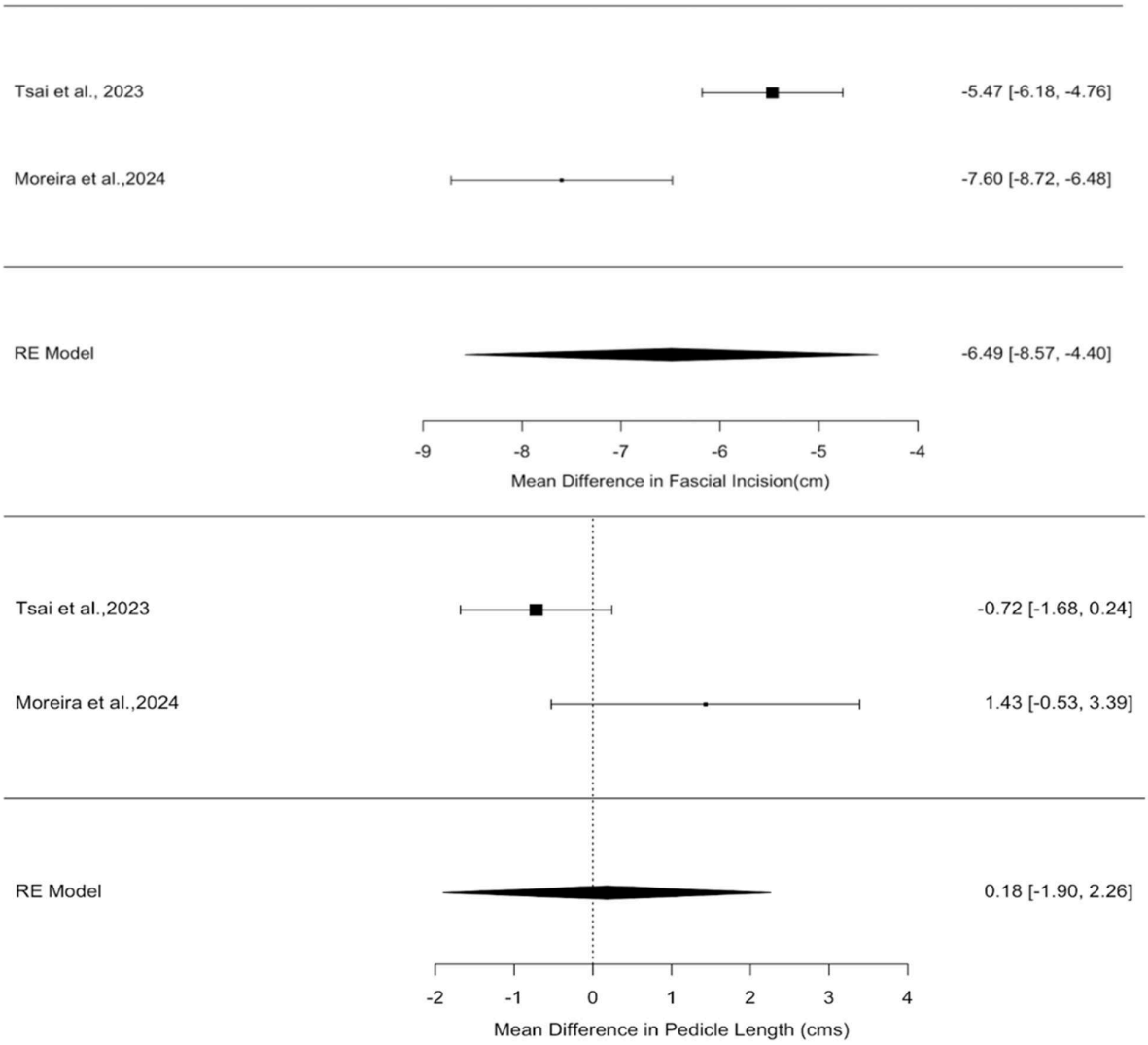
	Therapeutic Level	*Technique: n*	*Outcomes/Conclusion*	*Mean hospital stay*	*F/u Duration*
Shakir et al., 2020	III	Endoscopic: 94 TEP Laparoscopic: 38 TAP Robotic: 3	Total extraperitoneal laparoscopically assisted DIEP harvest is reliable that decreases donor-site morbidity	Endoscopic: 2.8 days, Laparoscopic: 4.7 days Robotic: 2.5 days	At least 3 months
Tsai et al., 2023	III	TAPP: 13 Conventional 86	Novel port placement allowed bilateral DIEP flap dissection without need for readjustment	NR	15 months
Daar et al., 2021	IV	TAP Robotic: 4	Robotic DIEP potentially reduces donor site morbidity while maintaining microsurgical success.	3.7 days	6.3 months
Wittesaele and Vandervoort, 2022	IV	TAPP Robotic: 10	Robotic DIEP is useful to limit length of the fascial incision in short intramuscular perforators	4-5 days	1.5 months
Moreira et al., 2024	III	TAPP Robotic: 23	Robotic DIEP is safe and reduce disruption of abdominal wall.	3.9 days	9.48 months
Bishop et al., 2020	IV	TAPP Robotic: 21	Mean difference between pedicle length and intramuscular course was 9.89 +- 2.28 cm (Benefit)	3.8 ± 0.9 days	5 months
Gundlapalli et al., 2018	V	TAPP Robotic:1	Novel robotic technique minimizes morbidity obviating need for mesh reconstruction	NR	9 months
Lee et al., 2022	III	TEP Robotic DIEP: 19 Conventional: 185	Robotic DIEP enhances postoperative recovery and reduces postoperative pain and hospital stay	7.95 +- 1.22 days	NR
Hivelin et al., 2017	V	TEP laparoscopic: 1	Laparoscope assisted DIEP harvest reduced trauma to anterior rectus sheath is feasible.	Day 5	NR
Struk et al.,2017	NA	TEP: 1	NA	NA	NA
Stroumza et al.,2016	NA	Endoscopic: 5	NA	NA	NA
Manrique et al.,2019	NA	Robotic DIEP TEP: 4 TAPP: 4	NA	NA	NA
Kim et al.,2023	III	Short fasciotomy: 124	Short fasciotomy had significantly lower rate of abdominal bulge/hernia than conventional Overall benefit of length of fasciotomy is 5.9 cm	8.8 +- 0.7 days	16.8 months
Dellacroce et al., 2019	III	APEX: 185	Myotomy avoided by APEX pedicle dissemble: 2.56 +- 0.88	3.5 +- 0.83 days	13.3 +- 12.5 months

Zoccali and Farhadi, 2021	IV	APEX :51	APEX flap represents technical evolution limits donor-site morbidity; however, sometimes can be challenging and requires specialized equipment	NR	NR
Shakir et al.,2019	IV	2-stage delayed DIEP: 135	2-stage delayed DIEP is safe and reliable and improves donor site esthetic and morbidity	2.7 days	7.8 months
Colohan et al.,2012	IV	Short and Ultrashort DIEP: 26	Adequate vessel diameters and pedicle length and rich venous interconnections makes shorter-pedicle DIEP safe and efficient	NR	8.8 months
Schoellar et al.,2002	IV	Modified paraumbilical: 15	2/3 cases required venous super drainage. Comparable donor site morbidity to free paraumbilical perforator flap without super microsurgery	8 days	10 months
Song et al.,2023	I	Vascular pedicle measuring: 209	Vascular pedicle should be designed individually to reduce undue intramuscular dissection and lower the risk of donor site morbidity and complication rate	NR	NR
Martinez and Boutros,2020	IV	Microfascial incision DIEP: 68 Stacked flaps: 14	Modified operative technique, multimodal pain control allowed outpatient perforator-flap based breast reconstruction with high success and low complication rates	23 hours	6.5 months

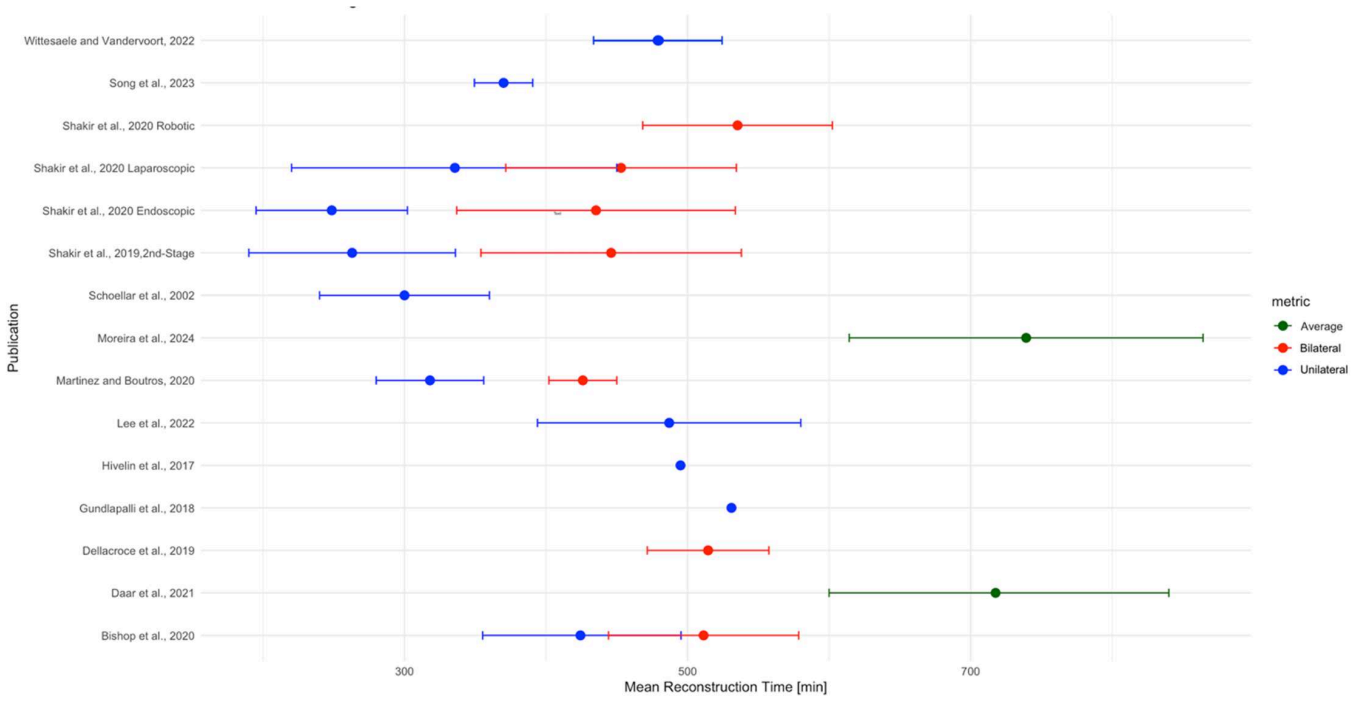
Supplementary Table 1: Overview of all the study
Abbreviation: DIEP: Deep Inferior Epigastric Perforator Flap, TEP: Totally Extraperitoneal, TAPP: Transabdominal preperitoneal, NA: Not applicable, NR: Not Reported

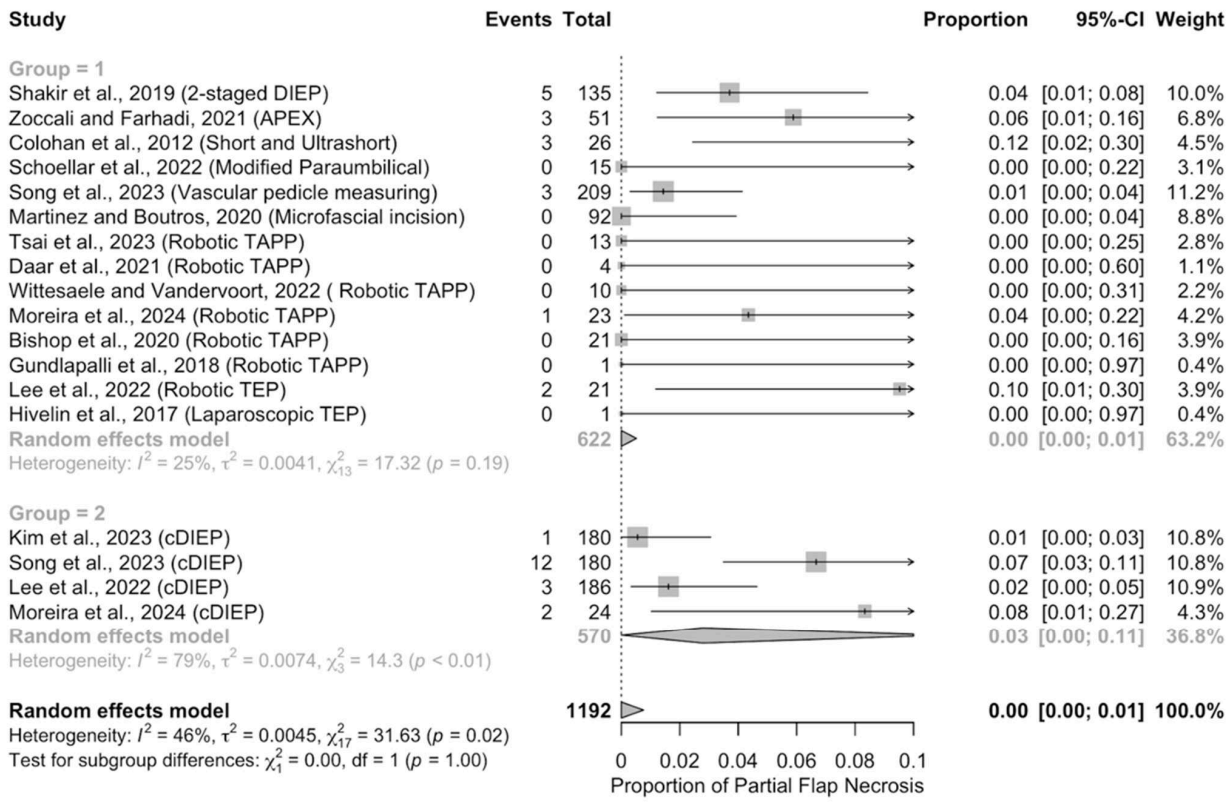
Author	***Total Harvest Time***	***Robot console time***
Gundapalli et al., 2018	40 minutes	NR
Shakir et al., 2020	40 mins	NA
Bishop et al., 2020	NR	44.8 ± 9.3
Daar et al., 2021	NR	NR
Lee et al., 2022	NA	68.8 mins
Tsai et al., 2023	53.2 ± 13.4 mins	NR
Whittesaele and Vandervoort., 2023	NR	86 mins
Moreira et al., 2024	35 mins**	135* mins
* Includes setup time **per side		

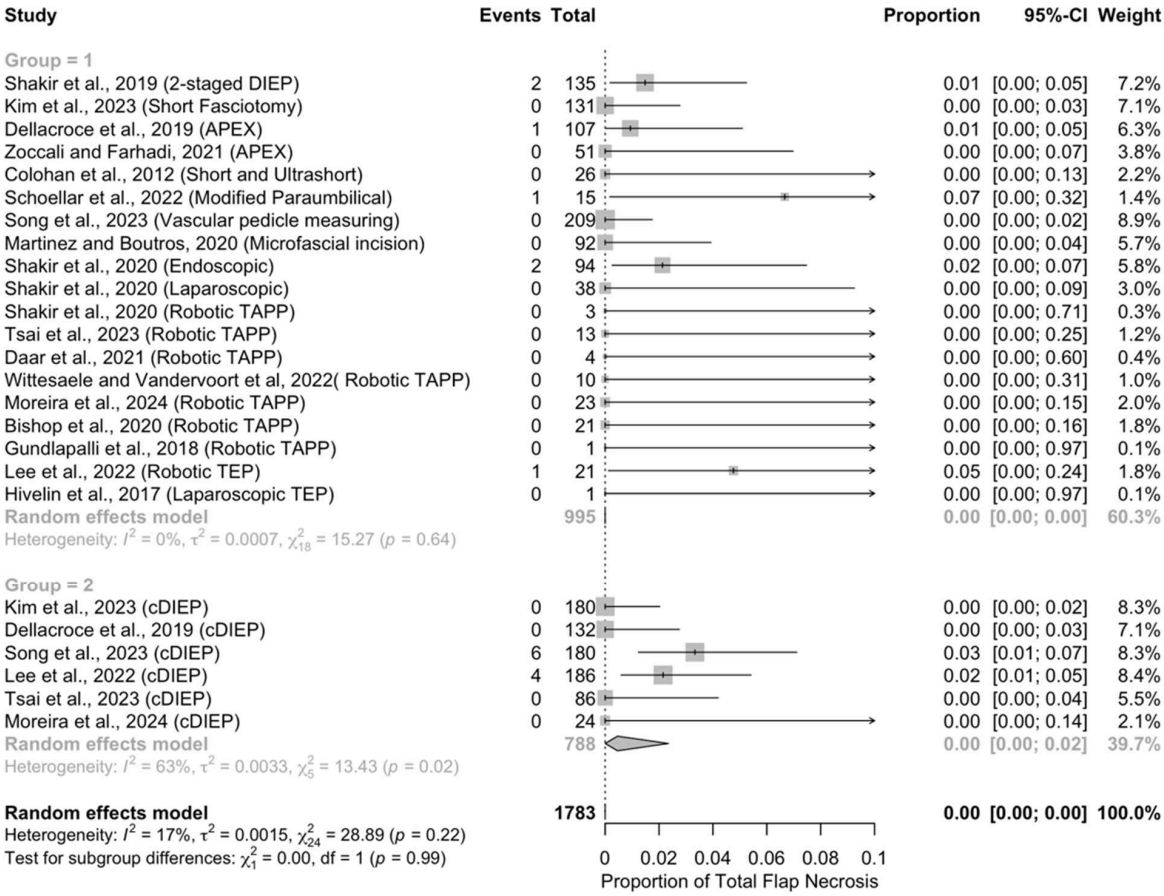
Table 2: Total harvest time (includes perforator and pedicle dissection) and robot console time (perforator, pedicle dissection, and peritoneum repair).

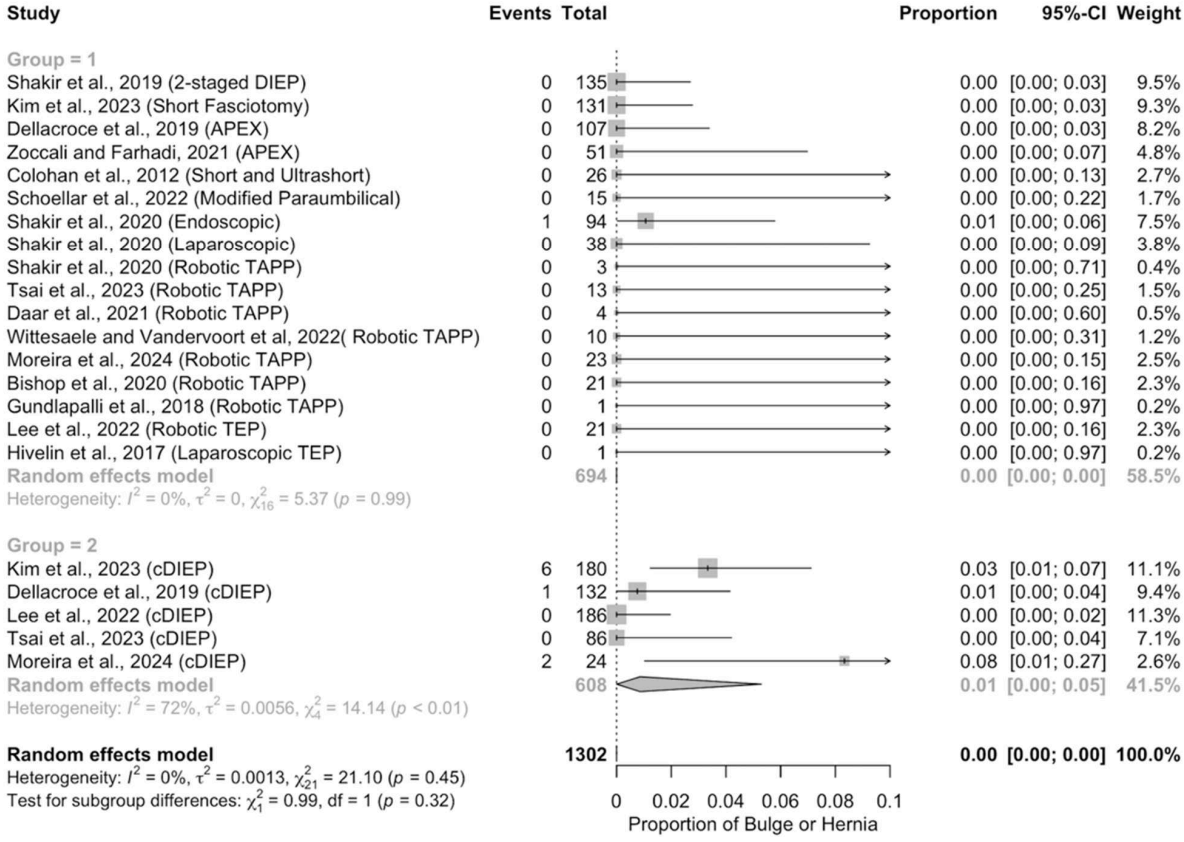


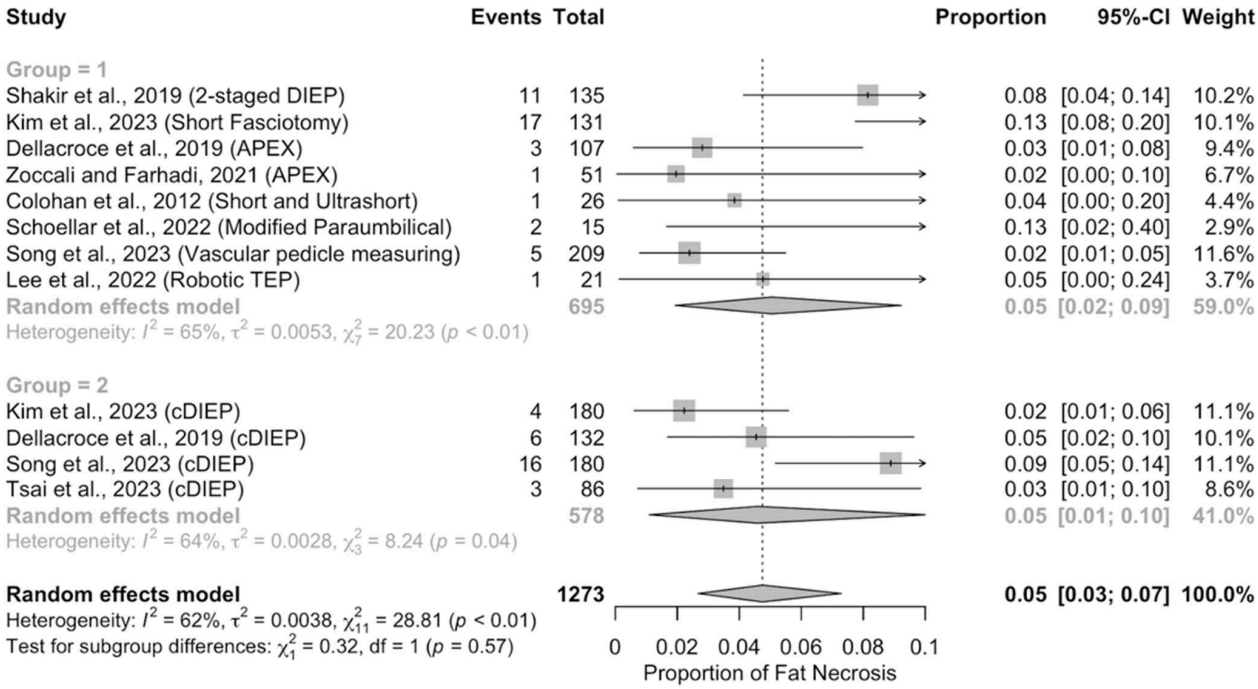
Supplementary Fig. 1. Mean difference in fascial incision and pedicle length between rDIEP and cDIEP



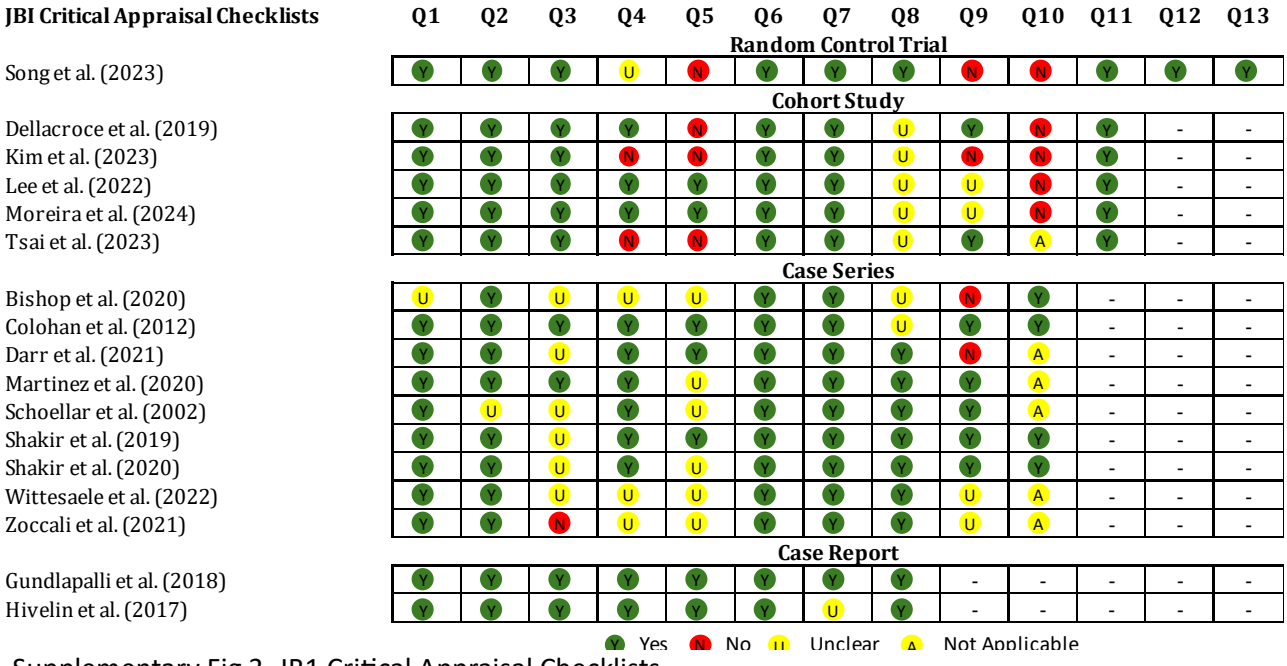








Supplementary Fig 2. Complications (partial flap necrosis, total flap necrosis, bulge/hernia and fat necrosis) between the MIDIEP and Conventional DIEP technique using Freeman-Tukey arcsine transformation. cDIEP: conventional deep inferior epigastric perforator flap, APEX: abdominal perforator exchange, TAPP: transabdominal preperitoneal; TEP, totally extraperitoneal



Supplementary Fig 3. JB1 Critical Appraisal Checklists.

Random Control Trial

Q1: Was true randomization used for assignment of participants to treatment groups?

Q2: Was allocation to treatment groups concealed?

Q3: Were treatment groups similar at the baseline?

Q4: Were participants blind to treatment assignment?

Q5: Were those delivering the treatment blind to treatment assignment?

Q6: Were treatment groups treated identically other than the intervention of interest?

Q7: Were outcome assessors blind to treatment assignment?

Q8: Were outcomes measured in the same way for treatment groups?

Q9: Were outcomes measured in a reliable way

Q10: Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?

Q11: Were participants analysed in the groups to which they were randomized?

Q12: Was appropriate statistical analysis used?

Q13: Was the trial design appropriate and any deviations from the standard RCT design (individual randomization, parallel groups) accounted for in the conduct and analysis of the trial?

Cohort Study

Q1: Were the two groups similar and recruited from the same population?

Q2: Were the exposures measured similarly to assign people to both exposed and unexposed groups?

Q3: Was the exposure measured in a valid and reliable way?

Q4: Were confounding factors identified?

Q5: Were strategies to deal with confounding factors stated?

Q6: Were the groups/participants free of the outcome at the start of the study (or at the moment of exposure)?

Q7: Were the outcomes measured in a valid and reliable way?

Q8: Was the follow up time reported and sufficient to be long enough for outcomes to occur?

Q9: Was follow up complete, and if not, were the reasons to loss to follow up described and explored?

Q10: Were strategies to address incomplete follow up utilized?

Q11: Was appropriate statistical analysis used?

Case Series

Q1: Were there clear criteria for inclusion in the case series?

Q2: Was the condition measured in a standard, reliable way for all participants included in the case series?

Q3: Were valid methods used for identification of the condition for all participants included in the case series?

Q4: Did the case series have consecutive inclusion of participants?

Q5: Did the case series have complete inclusion of participants?

Q6: Was there clear reporting of the demographics of the participants in the study?

Q7: Was there clear reporting of clinical information of the participants?

Q8: Were the outcomes or follow up results of cases clearly reported?

Q9: Was there clear reporting of the presenting site(s)/clinic(s) demographic information?

Q10: Was statistical analysis appropriate?

Case Report

Q1: Were patient's demographic characteristics clearly described?

Q2: Was the patient's history clearly described and presented as a timeline?

Q3: Was the current clinical condition of the patient on presentation clearly described?

Q4: Were diagnostic tests or assessment methods and the results clearly described?

Q5: Was the intervention(s) or treatment procedure(s) clearly described?

Q6: Was the post-intervention clinical condition clearly described?

Q7: Were adverse events (harms) or unanticipated events identified and described?

Q8: Does the case report provide takeaway lessons?

