A Systematic Review and Meta-Analysis of Reported Success and Complication Outcomes the Management of Acute Upper Limb Ischaemia

Angela D. Lee, MBBS MRCS, Eftichia Iossifidis, MBBS iBSc MRCS, Chloe Harding, MRes, Navanith Murali, MBBS MRes, Joseph Borucki, MBBS BSc (Hons) MSc PGCert, Tamer El-Sayed, MD FRCS, Tariq Ali, MBBS MRCP MSc (Oxon) MRCGP FHEA FRCR EBIR-ES MBA, Sandip Nandhra, MBBS MD FRCS, Philip W. Stather, MBChB MD FRCS

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Angela D Lee MBBS MRCS[1,3], Eftichia Iossifidis MBBS iBSc MRCS[1], Chloe Harding MRes[3], Navanith Murali MBBS MRes[2], Joseph Borucki MBBS BSc (Hons) MSc PGCert[4], Tamer El-Sayed MD FRCS[5], Tariq Ali MBBS MRCP MSc (Oxon) MRCGP FHEA FRCR EBIR-ES MBA[2], Sandip Nandhra MBBS MD FRCS[5,6], Philip W Stather MBChB MD FRCS[1,3]

1 - Department of Vascular Surgery, Norfolk and Norwich University Hospital, Colney Lane, Norwich, NR4 7UY, UK

2 – Department of Radiology, Norfolk and Norwich University Hospital, Colney Lane, Norwich, NR4 7UY, UK

3 – Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ, UK

4 – Department of General Surgery, Norfolk and Norwich University Hospital, Colney Lane, Norwich, NR4 7UY, UK

5 – The Northern Vascular Centre, Freeman Hospital, Newcastle upon Tyne, UK

6 - Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, UK

*Corresponding author:

Miss Angela Diana Ying Ni Lee MBBS MRCS

ACF ST2 in Vascular Surgery

Norfolk and Norwich University Hospital

Colney Lane

Norwich

NR4 7UY

Email: angela.lee@nnuh.nhs.uk

Contact number: +447521740700

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Author Contributions

Angela D Lee (Conceptualisation, Literature search, Study screening and selection, Assessment of quality of data, Data curation, Formal analysis, Manuscript writing- original draft, review and editing), Eftichia Iossifidis (Data curation), Chloe Harding (Literature search, Study screening and selection, Assessment of quality of data), Navanith Murali (Literature search, Study screening and selection), Joseph Borucki (Formal analysis), Tamer El-Sayed (Manuscript writing- review and editing), Tariq Ali (Manuscript writing- review and editing), Sandip Nandhra (Manuscript writing- review and editing), Philip W Stather (Conceptualisation, Manuscript writing- original draft, review and editing)

Running Title: Acute arm ischaemia meta-analysis

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Angela D Lee MBBS MRCS[1,3], Eftichia Iossifidis MBBS iBSc MRCS[1], Chloe Harding MRes[3], Navanith Murali MBBS MRes[2], Joseph Borucki MBBS BSc (Hons) MSc PGCert[4], Tamer El-Sayed MD FRCS[5], Tariq Ali MBBS MRCP MSc (Oxon) MRCGP FHEA FRCR EBIR-ES MBA[2], Sandip Nandhra MBBS MD FRCS[5,6], Philip W Stather MBChB MD FRCS[1,3]

1 - Department of Vascular Surgery, Norfolk and Norwich University Hospital, Colney Lane, Norwich, NR4 7UY, UK

2 – Department of Radiology, Norfolk and Norwich University Hospital, Colney Lane, Norwich, NR4 7UY, UK

3 – Norwich Medical School, University of East Anglia, Norwich, NR4 7TJ, UK

4 – Department of General Surgery, Norfolk and Norwich University Hospital, Colney Lane, Norwich, NR4 7UY, UK

5 – The Northern Vascular Centre, Freeman Hospital, Newcastle upon Tyne, UK

6 - Population Health Sciences Institute, Newcastle University, Newcastle upon Tyne, UK

*Corresponding author:

Miss Angela Diana Ying Ni Lee MBBS MRCS

ACF ST2 in Vascular Surgery

Norfolk and Norwich University Hospital

Colney Lane

Norwich

NR4 7UY

Email: angela.lee@nnuh.nhs.uk

Contact number: +447521740700

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What this paper adds

This meta-analysis summarises the available literature describing outcomes following surgical, endovascular and medical management of acute upper limb ischaemia. The review demonstrates that the evidence base is limited, heterogeneous and at high risk of bias, preventing reliable comparison between treatment strategies. The study highlights major knowledge gaps, including inconsistent reporting of clinical severity, functional outcomes and long-term follow-up, and identifies key priorities for future prospective studies and randomised trials.

Abstract

Objectives

Acute upper limb ischaemia (AULI) is a surgical emergency whereby the upper limb blood supply is threatened, leading to a risk to a risk of limb loss, functional disability, or life-threatening complications. A variety of strategies for management exist and include, anticoagulation (termed medical management), open surgery, and endovascular techniques. There are no clear guidelines on how AULI should be managed safely. This review aimed to explore the current strategies of AULI and their associated outcomes.

Methods

A systematic review was performed in accordance with PRISMA guidelines and registered prospectively in PROSPERO (CRD420251005180). MEDLINE, EMBASE, CINAHL and CENTRAL were searched from inception to September 2025. Observational studies reporting outcomes following surgical, endovascular or medical management of AULI were included.

Risk of bias was assessed using ROBINS-I and certainty of evidence using GRADE methodology. Random-effects proportional meta-analysis was performed using Stata.

Results

Twenty-seven studies (3162 patients) were included, with no randomised controlled trials identified. Reported overall success rates were 90.1% (95%CI 84.5–94.7) for surgical management, 71.8% (95%CI 41.1–94.9) for endovascular management and 79.4% (95%CI 52.6–97.8) for medical management. Substantial heterogeneity was observed across all treatment groups (I^2>87%). Reported complication and reintervention rates varied widely across studies. All 27 studies were assessed as having a high risk of bias, mainly due to lack of adjustment for confounding factors and incomplete baseline severity reporting. Certainty of evidence was low to very low.

Conclusion

The current evidence describing outcomes following AULI management is limited, heterogeneous and predominantly derived from retrospective observational studies that lacked standardised outcome definitions and long-term functional follow-up data.. Due to confounding by indication and lack of direct comparisons, reliable conclusions regarding relative effectiveness between treatment strategies cannot be made. Prospective multicentre studies and randomised trials are required.

Key words: Acute limb ischaemia, upper extremity, embolectomy, thrombolysis, outcomes research

Introduction

Acute upper limb ischaemia (AULI) is a medical emergency that requires prompt diagnosis and treatment to prevent devastating consequences such as loss of function of the limb or loss of the limb itself (1). Therefore, AULI requires prompt diagnosis and treatment within hours to prevent these devastating consequences. Thromboembolic disease, including both embolic (approximately 50-60%) and thrombotic (approximately 15-25%) aetiologies, accounts for around 75% of cases, with the remainder due to trauma, iatrogenic injury or aneurysmal disease.

In contrast to acute lower limb ischaemia, for which endovascular intervention is increasingly becoming more popular, there is no agreed first line revascularisation strategy (2), though many clinicians advocate a surgical approach to revascularise the limb. Globally, AULI is managed with surgical embolectomy, a variety of endovascular techniques, or with a medical strategy with anticoagulation (3). Despite the potentially devastating consequences of AULI, there remains no clear evidence-based guidance on optimal management. This knowledge gap exists due to a lack of robust comparative data, the complete absence of randomised control trials, and the paucity of large prospective cohort studies, with the guiding principles adopted from the lower limb. Current management is therefore based on established principles; patients should be treated by vascular surgeons with expertise, in units where there is access to a full range of vascular and endovascular therapeutic options (2).

Over the past few decades, endovascular treatment has become a popular revascularisation option, because it is less invasive than surgery, and therefore has potentially shorter hospital stays. This has been less universally accepted in acute limb ischaemia compared to chronic limb ischaemia and even more so in the upper limb than the lower limb. With an increasingly older population there are often comorbidities and frailty that must be considered as part of patient management, reinforcing the need for less invasive options, including medical management of AULI.

The aim of this systematic review and meta-analysis is to synthesis available evidence on outcomes (technical and clinical success, complications and re-intervention rates) for patients with AULI undergoing surgical, endovascular and medical management strategies, and to identify gaps in the current evidence base,

Methods

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement. The review protocol was prospectively registered on the International Prospective Register of Systematic Reviews (PROSPERO; CRD420251005180).

Information Sources

A comprehensive literature search was undertaken using EMBASE, MEDLINE, CINAHL and CENTRAL. Initial searches were undertaken on March 9th 2025 and updated on September 1st 2025. The reference lists of included studies were also reviewed to identify additional articles.

Search Strategy

The search terms acute, upper limb, arm, isch*, and thromb* were included with studies looking primarily at stroke or cerebr* within the title excluded. For a full search strategy please see Supplemental 1.

Eligibility Criteria

To be included within this meta-analysis, studies had to be either randomised controlled trials, prospective or retrospective cohort studies or case series. Each study had to include one of surgical, endovascular or medical management for AULI with each management strategy subgrouped for analysis. Studies had to report on either technical or clinical success. Case reports, editorials, and conference abstracts, studies not reporting relevant outcomes, and studies of chronic limb ischaemia, traumatic limb ischaemia, lower limb ischaemia, and aneurysmal ischaemia were excluded. There were no limitations to the publication date or language.

Study screening/Selection

Titles, abstracts and full-text reviews were screened by three independent reviewers (AL, NM and CH) and any discrepancies resolved by discussion with the senior author (PWS).

Data Extraction/Outcomes

Data was extracted directly onto an Excel spreadsheet. This was undertaken independently by 2 reviewers (AL and EI). Data on study design, sample size, patient demographics, intervention details, and outcomes was collected. Any discrepancies were discussed until resolution or raised to the senior author (PWS).

Primary outcome was whether the intervention was successful, defined as either technical or clinical success.

Technical success was defined as presence of pulse or flow on angiography, and clinical success as improvement in symptoms.

Secondary outcomes include reintervention rates (defined as any additional procedure required to achieve or maintain vascular patency) and significant complication rates defined as amputation, cerebrovascular accident, or mortality within 30 days.

Statistical Analysis

Extracted data was analysed using Stata Version 18. A proportional meta-analysis was conducted using a random-effects model, due to the anticipated heterogeneity of the studies. Statistical heterogeneity was assessed using the I^2 statistic and Cochran's Q test. Heterogeneity was interpreted as low (<25%), moderate (25–75%), or high (>75%). Sub-group analyses were also performed for technical success, clinical success, reintervention, site of occlusion, and for studies published from 2000 onwards.

Bias and Certainty Assessment

The quality of the evidence was assessed by two independent reviewers (AL and CH) using the Cochrane ROBINS-I V2 tool for non-randomised studies (5). There were no randomised control trials in this review requiring further bias assessments.

Certainty of Evidence Assessment

Certainty of evidence for key outcomes was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework. Evidence derived from observational studies was initially rated as low certainty and was downgraded where appropriate based on risk of bias, inconsistency, indirectness, imprecision and publication bias.

Given the observational nature of included studies and expected confounding by indication, analyses were considered descriptive and hypothesis-generating rather than comparative.

Results

The systematic search identified 351 records, of which 131 duplicates were removed. Following title and abstract screening of 220 records, 203 studies were excluded. Seventeen full-text articles were sought for retrieval, of which 15 were retrieved and assessed for eligibility. Five studies were excluded following full-text review.

Another 34 studies were identified from citation searching, of which 17 studies met inclusion criteria. This resulted in a total of 27 studies for inclusion in the final analysis (Figure 1). The relatively high proportion of studies identified through citation searching likely reflects historical variation in terminology, indexing and reporting of acute upper limb ischaemia in older vascular literature. The search strategy was developed iteratively and supplemented with manual reference screening to maximise study capture, consistent with recommended systematic review methodology.

Study Characteristics

Of the 27 included studies, 22 reported on surgical intervention(6-27), 5 studies reported on endovascular intervention(6, 28-31), and 10 studies reported on conservative management(6, 11, 16, 17, 19-21, 23, 24, 32). Overall, 3162 patients were included across all studies.

All included studies were observational in design, with the majority being retrospective cohort studies or case series (19 out of 27, 70%). No randomised controlled trials comparing treatment modalities were identified.

Clinical severity, comorbidity burden, anatomical distribution of disease and treatment selection criteria were inconsistently reported across studies. Rutherford classification (33) was not reported in 12 of 27 studies (44%) (Table 1), particularly older publications. Where possible, classification was inferred from study descriptions for descriptive purposes, but these 12 studies were excluded from subgroup analyses requiring severity stratification.

Given the observational nature of included studies, substantial confounding by indication is likely. Patients receiving surgical, endovascular or medical management represent separate clinical cohorts and are not directly comparable. As such, pooled outcome estimates should be interpreted as descriptive summaries of reported outcomes rather than comparative effectiveness between treatment strategies.

Risk of bias assessment using ROBINS-1 tool demonstrated high overall risk of bias across all included studies, primarily due to lack of adjustment for confounding factors, incomplete reporting of baseline characteristics and variable outcome definitions.

Study Era Heterogeneity

Included studies spanned several decades (61 years), with publication dates ranging from 1964 to 2025. Changes over time in anticoagulation strategies, perioperative care, imaging quality and endovascular technology contribute to clinical heterogeneity across studies. Sensitivity analyses restricted to studies published from 2000 onwards were therefore performed to explore potential temporal effects and contemporary relevance.

Primary outcome

The primary outcome included technical (presence of pulse or flow on angiography) and clinical success (improvement in symptoms). Studies did not uniformly report on technical and clinical success separately; in several studies these were combined, and if both were reported, the higher value was taken. 22 studies (2854 patients) reported on the success rates for surgical intervention, with a success rate of 90.09% (95% CI: 84.51-94.66) I^2 91.78%. 5 studies (94 patients) reported on the success rates for endovascular intervention, with a success rate of 71.77% (95% CI: 41.14-94.85) I^2 87.35%. 10 studies (213 patients) reported on success rates for medical management, with a success rate of 79.38% (95% CI: 52.62-97.82) I^2 90.95% (Figure 2). Due to the high heterogeneity of the results, subgroup analyses were then performed for technical success and clinical success separately. These results show a clinical success rate of 84.96% for those medically managed, rising to 91.61% for surgical and 95.77% for endovascular management (see Table 2 for summary results and Supplemental 2 and 3 for Forest Plots).

Significant complications

Significant complication rates were not reported in all studies. 20 studies reported on surgical complication rates totalling 2803 patients (6-16, 18-20, 22-27). The overall complication rate for surgical management was 16.46% (95% CI 11.18-22.46) I^2 91.28%. 4 studies reported on endovascular complication rates totalling 63 patients, with a complication rate of 12.92% (95% CI 0.07-36.58) I^2 77.30% (6, 28-30). 6 studies reported on medical management reporting complication rates of 2.91% (95% CI 1.34-4.91) I^2=0.00% (6, 18-20, 23, 24) (Figure 3). Complication rates for stroke, amputation and mortality for those treated with surgical embolectomy, endovascular intervention, or medically are summarised in Table 3, Figure 3, and Supplementals 4-6.

Reintervention

12 studies reported on reintervention rates for surgical management, 9.66% (95% CI 5.41-14.74) I^2 60.22% (6, 8, 10, 13-15, 17, 20, 22, 24, 27, 31), 3 studies for endovascular management, 31.77% (95% CI 15.65-50.28) I^2 0.00% (6, 30, 31), and 4 studies for medical management 2.88% (95% CI 0.00-15.19) I^2 0.00% (6, 17, 20, 32) (Supplemental 7). In all studies but Ueda et al (30), if there was a reintervention performed, this was undertaken surgically, despite initial treatment approach (Table 4). Ueda at al was the only study to reintervene with further endovascular treatment in the form of percutaneous aspiration thromboembolectomy, catheter-directed thrombolysis, angioplasty, or a combination of those (30). This explains the profound difference in reintervention rates in the endovascular group as multiple procedures would be common and often planned for in this technique (6, 30). The

success rate for reintervention within the endovascular group was 98.99% (95% CI 85.88-100.00), surgical was 67.10% (95%CI 52.46-80.61) I^2= 0.00%, I^2= 0.00%, and medical was 100% (Supplemental 8).

Site of Occlusion

Although many studies reported on the anatomical sites of occlusion, with the brachial artery being the most commonly affected vessel in 8 studies (8, 9, 16-20, 29, 31) (Supplemental 9), only 5 studies reported on outcomes stratified by the anatomical site of occlusion (18, 19, 28, 29, 31). These were further analysed by proximal (subclavian and axillary arteries), mid (brachial artery), and distal (forearm and digital arteries). Pooled data identified that proximal occlusions had higher success rates 95.41% (95% CI 89.06-99.46) I^2 0.00%, followed by brachial artery occlusions 90.77% (95% CI 84.97-95.50) I^2 0.00%, then distal occlusions 68.74% (95% CI 31.15-97.33) (Figure 4).

Thrombus vs Embolus

Only one study, Coulon et al (28), reported on whether the occlusion was a thrombus or embolus and only consisted of 13 patients. There was therefore insufficient data to report on outcomes of AULI management of thrombosis compared to embolus.

Studies published from 2000 onwards

For studies published from 2000 onwards (7-10, 12-14, 22, 27, 29-32), sub-group analyses were performed for overall success (supplemental 10), technical success (supplemental 11), clinical success (supplemental 12), reintervention rates (supplemental 13), and complication rates (supplementals 14-17). Subgroup analyses did not identify any significant differences compared to overall data except for a higher stroke rate in both surgical (6.39% 95%CI 1.13-

14.51) and endovascular (12.15% 95% CI 1.79-27.70) publications, and a lower mortality rate in endovascular (1.62% 95% CI 0.00-11.81).

Risk of Bias

Overall, all 27 studies were assessed to have a high risk of bias due to none of them accounting for confounding factors (Figure 5). This highlights the lack of evidence covering AULI; there are no randomised controlled trials, the highest level of evidence is a prospective cohort study, and most studies are case series.

Certainty of Evidence

The certainty of evidence across all treatment groups was very low using GRADE methodology, reflecting the observational nature of available data, substantial heterogeneity and imprecision. As such, pooled estimates should be interpreted as descriptive summaries rather than evidence of comparative treatment effectiveness.

Discussion

This systematic review summarises reported outcomes following surgical, endovascular and medical management of AULI. Across 27 observational studies including more than 3,000 patients, reported overall clinical success rates were high for all treatment strategies, with pooled estimates of approximately 90% for surgical management, 72% for endovascular management and 79% for medical management. However, these findings must be interpreted cautiously. All included studies were observational, heterogeneous and at high risk of bias, and treatment allocation was driven by clinical severity and patient factors. Patients undergoing surgical, endovascular and medical management therefore represent distinct clinical cohorts and are not directly comparable. As such, pooled outcome estimates should be interpreted as descriptive summaries of reported outcomes rather than evidence of comparative treatment effectiveness.

Certainty of evidence across all key outcomes was low to very low using GRADE methodology, reflecting high risk of bias, substantial heterogeneity, imprecision and suspected publication bias. No randomised controlled trials comparing treatment modalities were identified. These findings are consistent with the broader vascular literature in acute limb ischaemia, where treatment selection is frequently guided by anatomical feasibility, clinical severity and patient comorbidity rather than comparative trial evidence.

Although reported success rates were generally high, complication rates following intervention were substantial. Pooled major complication rates approached 16% following surgical management and approximately 13% following endovascular intervention, with wide confidence intervals reflecting variability between studies. These complication rates are clinically important and highlight that AULI management is not a benign intervention. Complications including amputation, stroke and mortality were reported across treatment modalities and likely reflect both disease severity and treatment-related risk. Interestingly the technical success from medical management was 23% but with a clinical success of 85%. This may suggest that restoration of pulse is not always required for symptom improvement in selected patients; however, functional outcomes were not consistently reported and this interpretation should be made cautiously.

These findings are consistent with previous literature describing the systemic cardiovascular risk associated with acute limb ischaemia. Patients presenting with AULI frequently have significant atherosclerotic burden, cardioembolic risk or underlying hypercoagulable states, and therefore remain at high risk of adverse cardiovascular and limb-related outcomes even following technically successful revascularisation.

Importantly, the high complication rates observed emphasise the need for careful patient selection and risk stratification when considering invasive treatment strategies. In particular, the balance between limb salvage, functional recovery and procedural risk remains complex, particularly in older or comorbid patient populations. Prior studies have highlighted a high complication rate (8, 9), however one might expect that patients with poorer physiological reserve would be more likely to be managed conservatively; however, this was not consistently reflected in reported mortality outcomes. This may reflect selection bias or reporting heterogeneity between studies.

The predominance of historical cohorts within the medical management literature is particularly important. Most studies evaluating anticoagulation or conservative management were performed more than two to three decades ago and may not reflect contemporary practice, including advances in anticoagulation strategies, early imaging, catheter-directed thrombolysis and multidisciplinary vascular care pathways.

The primary outcome of overall success was defined as technical or clinical success as reported within individual studies; this was because technical and clinical success were not reported uniformly throughout the studies, with the majority of medical management only reporting clinical success. Where studies reported both technical and clinical success, the higher value was taken due to any term of success would likely determine no further intervention. Sub-group analyses for technical and clinical success separately were also performed to encounter any bias introduced (Supplemental 2, 3). In most studies, clinical success was based on improvement in ischaemic symptoms rather than validated functional outcome measures. In upper limb ischaemia, restoration of arterial patency or symptom improvement does not necessarily translate into optimal functional hand recovery. The lack of consistent reporting of functional outcomes represents a major limitation of the current evidence base and highlights an important priority for future research. Unfortunately, clinical success had no standardised method of measurement and therefore we are unable to comment on degree of residual functional deficit, and utilising a validated tool such as the DASH score (Disability of the Arm, Shoulder and Hand) is imperative in understanding this moving forwards (34, 35).

Confounding by indication represents a major limitation of the available evidence. Treatment selection in AULI is strongly influenced by clinical severity, anatomical distribution of disease and patient comorbidity. Patients with more severe ischaemia are more likely to undergo intervention, while patients with milder disease or high procedural risk may be managed medically. Inconsistent reporting of Rutherford classification across studies further limits interpretation of treatment outcomes relative to disease severity.

The relatively small proportion of patients treated medically in pooled analyses likely reflects selection bias and differences in study design rather than true clinical practice distribution. In studies reporting both surgical and medical cohorts, the proportion of medically managed patients was higher, highlighting the challenges of comparing pooled outcomes across heterogeneous datasets.

The higher rate of stroke within the surgical and endovascular cohort is also concerning. Firstly, it would be imperative to determine if there were any signs of stroke on initial presentation, as embolic events in multiple territories is a possibility, though this should still remain equal between all 3 groups and the stroke rate in the medical cohort was 0.18%. The surgical technique may play a part causing the clot to become dislodged from the brachiocephalic trunk or subclavian into the carotid or vertebral arteries but most patients had emboli within the brachial artery. It was not possible to subgroup these patients further to evaluate whether proximal emboli were more likely to lead to stroke. Subgroup analysis also showed that stroke rates were higher in more recent publications however this may be due to better imaging quality and technique.

This review has several important limitations. All included studies were observational and subject to selection bias, attrition bias and confounding by indication. Clinical severity was inconsistently reported and often not stratified by treatment group. Substantial heterogeneity existed in patient populations, treatment selection, follow-up duration and outcome definitions. Follow-up periods ranged from in-hospital outcomes to long-term follow-up exceeding 10 years, limiting comparability between studies. There were no head-to-head comparative studies between treatment modalities. Certainty of evidence across outcomes was low to very low using GRADE methodology.

Future research should prioritise prospective multicentre studies and randomised controlled trials comparing treatment strategies in clearly defined patient populations. Standardised reporting of clinical severity, functional outcomes and follow-up duration will be essential to allow meaningful comparison between treatment approaches.

Conclusions

Current evidence describing outcomes following treatment of acute upper limb ischaemia is limited, heterogeneous and derived predominantly from retrospective observational studies. While reported success rates are high, complication rates following intervention are substantial and clinically important. Due to confounding by indication and lack of direct comparative evidence, reliable conclusions regarding relative effectiveness between surgical, endovascular and medical management cannot be made. High-quality prospective and randomised studies are required to define optimal treatment strategies.

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Table 1 – Demographics and treatment methods for all included studies

Author	Year	Age	Male (%)	Rutherford classification	Follow up period	Total number of emboli	Surgical (number)	Endovascular (number)	Medical (number)
Baguneid et al	1999	68 (33-69)	40.0		18 months	21	3	12	6
Hammamia et al	2019	69 (31-92)	34.8		1 month	136	136	0	0
Coulon et al	1994	63.6 (31-83)	30.8		Up to 5 years	13	0	13	0
El-Sayed et al	2024	73.1	40.0	I, IIa, IIb, III	6-8 weeks	96	96	0	0
Andersen et al	2010	74.6	36.6		5 years	1377	1377	0	0
Haranrayan et al	2021	62.4 (30-92)	23.1	IIb	16 years	16	16	0	0
Kim et al	2011	74.5 (63-84)	63.6		8-25 months	11	0	11	0
Stonebridge et al	1989	74 (33-94)	11.6		In hospital	61	50	0	11
Sultan et al	2001	51 (19-81)	40.6	I, IIa, IIb	1 month	47	47	0	0
Turner et al	2010				1 year	16	0	0	16
Ueda et al	2017	74.4	22.2	IIa, IIb	612 days	18	0	18	0
Magishi et al	2010	73 (54-91)	66.0	IIa, IIb	20.2 months	21	21	0	0
Hernandez-Richter et al	2001	73	40.6		3-5 years	251	251	0	0
Wirsing et al	1983	67 (7-95)	49.0	I, IIa, IIb	In hospital	70	70	0	0
Kretz et al	1984	69 (23-87)	38.6	I, IIa, IIb, III	30 days	154	140	0	14
Vohra et al	1991	64.5 (37-92)	40.0	IIb	1 year	43	36	0	7
Darling et al	1967				In hospital	68	52	0	16
Savelyev et al	1977	62.7	33.0	IIb, III	In hospital	258	211	0	47
Katz et al	1993		37.0		35 months	32	32	0	3
Baird et al	1964	60 (18-92)	58.9		1-5 years	95	17	0	78
Licht et al	2004	78 (27–93)	56.0	I, IIa, IIb	29 months	148	148	0	0
Ricotta et al	1983			I, IIa, IIb, III	In hospital	44	31	0	9
Galbraith et al	1985	66.9 (24–90)		I, IIa	In hospital	31	25	0	6
Cejna et al	2001	63.5	37.5	I, IIa, IIb	1 year	40	0	40	0
Karr et al	1989	68	52.7	III	6 months	51	51	0	0
Davies et al	1991	64.5 (24-89)	66.7	IIa, IIb, III	5 years	36	36	0	0
Bang et al	2009	49–86	1.3	IIa, Iib	In hospital	8	8	0	0
Total						3162	2854	94	213
Percentage							90.26%	2.97%	6.74%

Table 2 – Summary table of meta-analysis for clinical and technical success of acute upper limb ischaemia management through surgical, endovascular and medical methods

	Clinical Success			Technical Success		
	Number of Studies	**Number of patients**	**Outcome**	**Number of Studies**	**Number of Patients**	**Outcome**
Surgical	11	602	91.61 (87.02-95.39) I^2= 58.60%	13	874	87.19 (79.99-93.10) I^2=84.88
Endovascular	5	94	95.77 (84.20-100.00) I^2= 62.99%	5	94	64.34 (42.14-83.96) I^2=75.03%
Medical	7	136	84.96 (67.47-97.26) I^2=70.50%	4	77	23.42 (13.81-34.36) I^2=0.00%

Table 3 – Complication rates from patients undergoing surgical, endovascular and medical treatment for acute upper limb ischaemia

		Number of Studies	Number of patients with complication	Combined Outcome
Total Complication Rate	Surgical	20	727	16.46 (11.18-22.46) I^2= 91.28%
	Endovascular	4	9	12.92 (0.07-36.58) I^2=77.30%
	Medical	6	17	2.91 (1.34-4.91) I^2=0.00%
Amputation Rate	Surgical	20	115	3.41 (1.88-5.29) I^2= 70.32%
	Endovascular	4	0	(0.00-3.26) I^2= 0.00
	Medical	6	3	0.18 (0.00-1.79) I^2= 35.23%
Stroke Rate	Surgical	18	303	4.42 (1.40-8.64) I^2=92.13%
	Endovascular	4	5	6.47 (0.00-20.01) I^2= 54.14%
	Medical	6	0	0.00 (0.00-0.11) I^2= 0.00%
Mortality Rate	Surgical	18	309	7.47 (5.03-10.29) I^2= 75.92%
	Endovascular	4	4	4.13 (0.00-17.56) I^2= 60.49%
	Medical	5	14	1.81 (0.01-5.36) I^2= 45.44%

491 **Table 4 – Rates of reintervention success for patients who initially underwent surgical,**
492 **endovascular and medical treatment for acute upper limb ischaemia**

	Number of Studies	Number of Patients	Reintervention Rate	Reintervention Success Rate
Surgical	10	70	9.66% (5.41-14.74) I^2= 60.22%	67.10% (52.46-80.61) I^2= 0.00%
Endovascular	3	23	31.77% (15.65-50.28) I^2 = 0.00%	98.99% (85.88-100.00) I^2= 0.00%
Medical	1	2	2.88% (0.00-15.19) I^2= 0.00%	100%

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495 **Figure 1- PRISMA flow diagram**

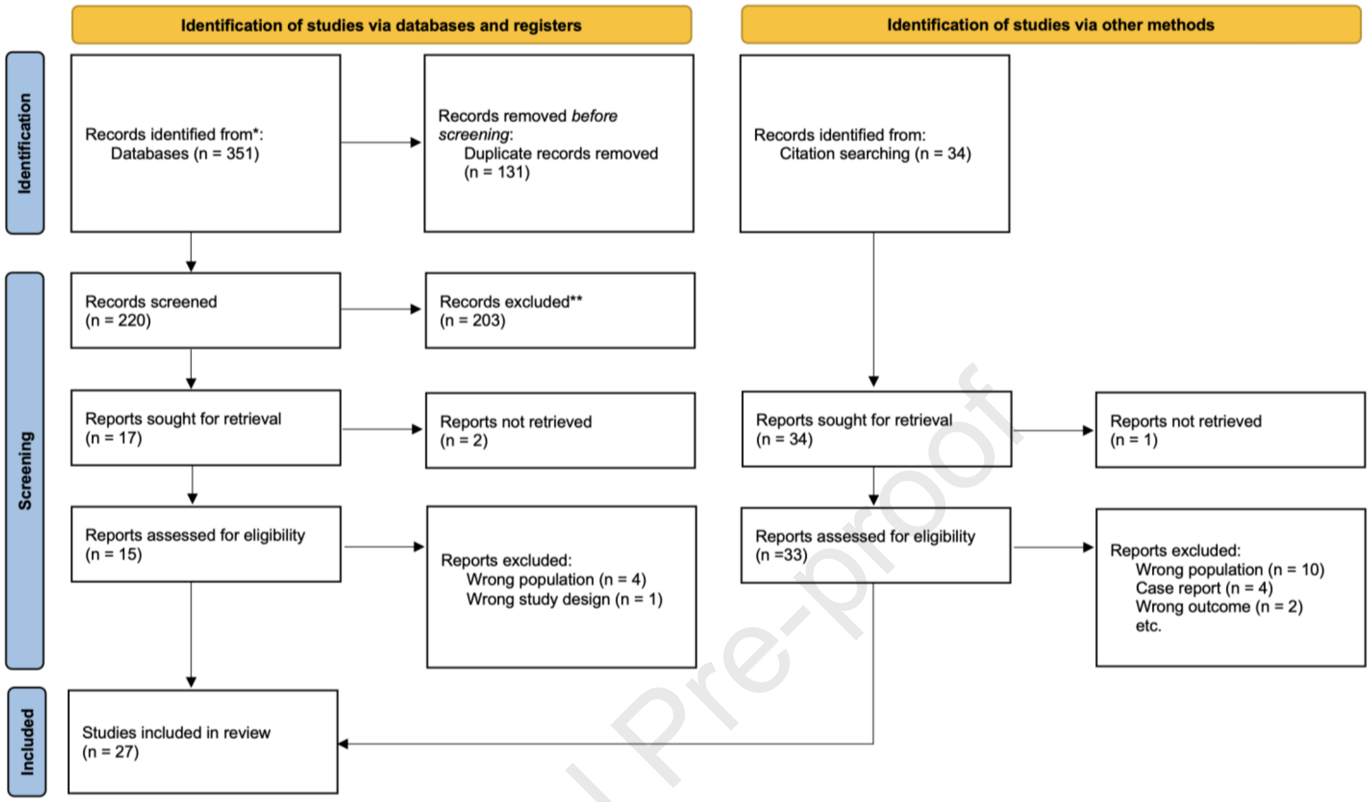
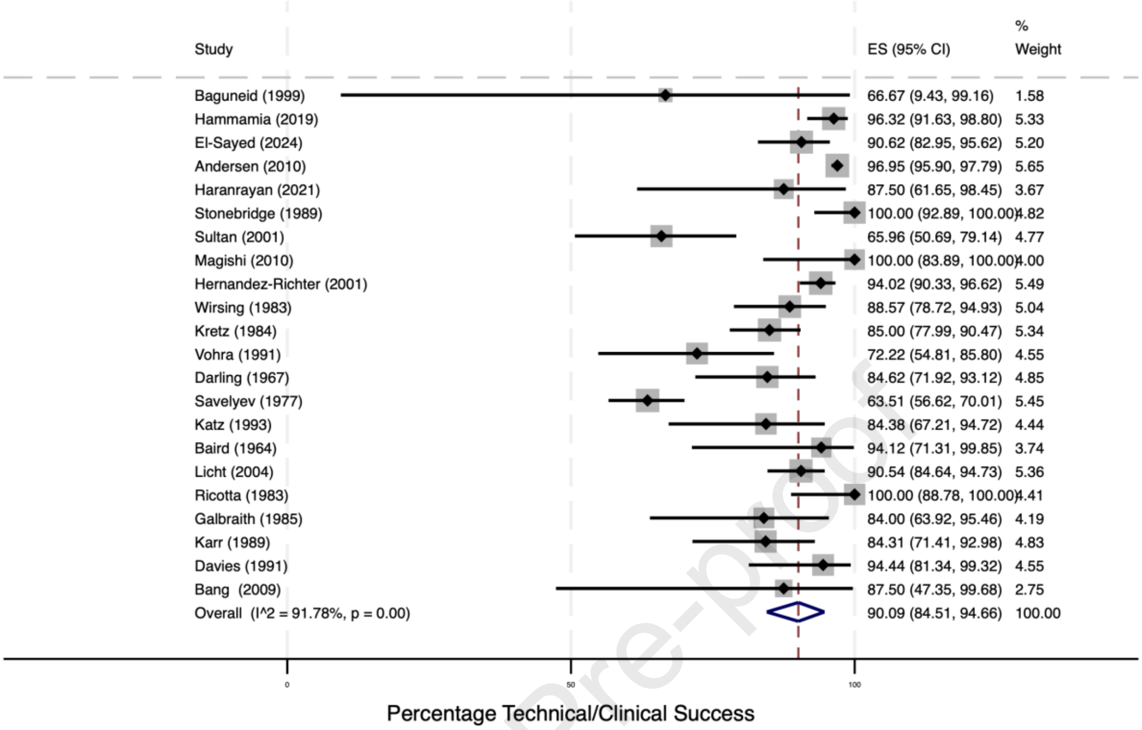
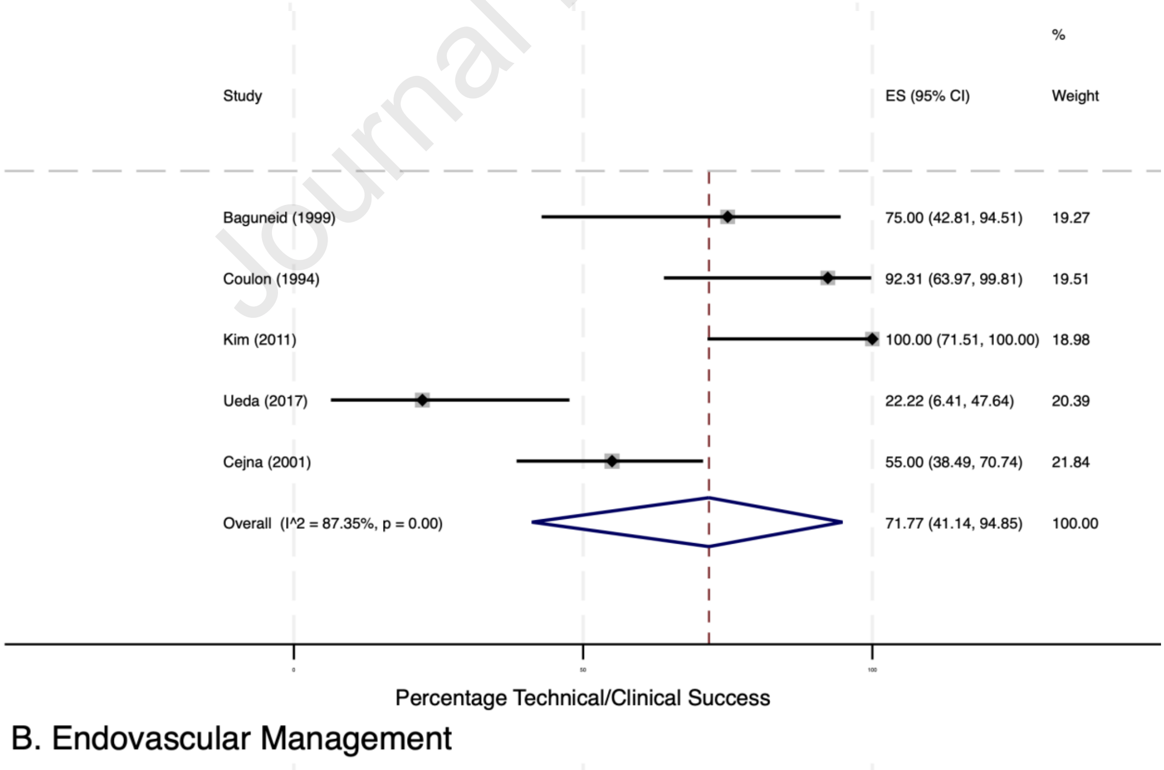


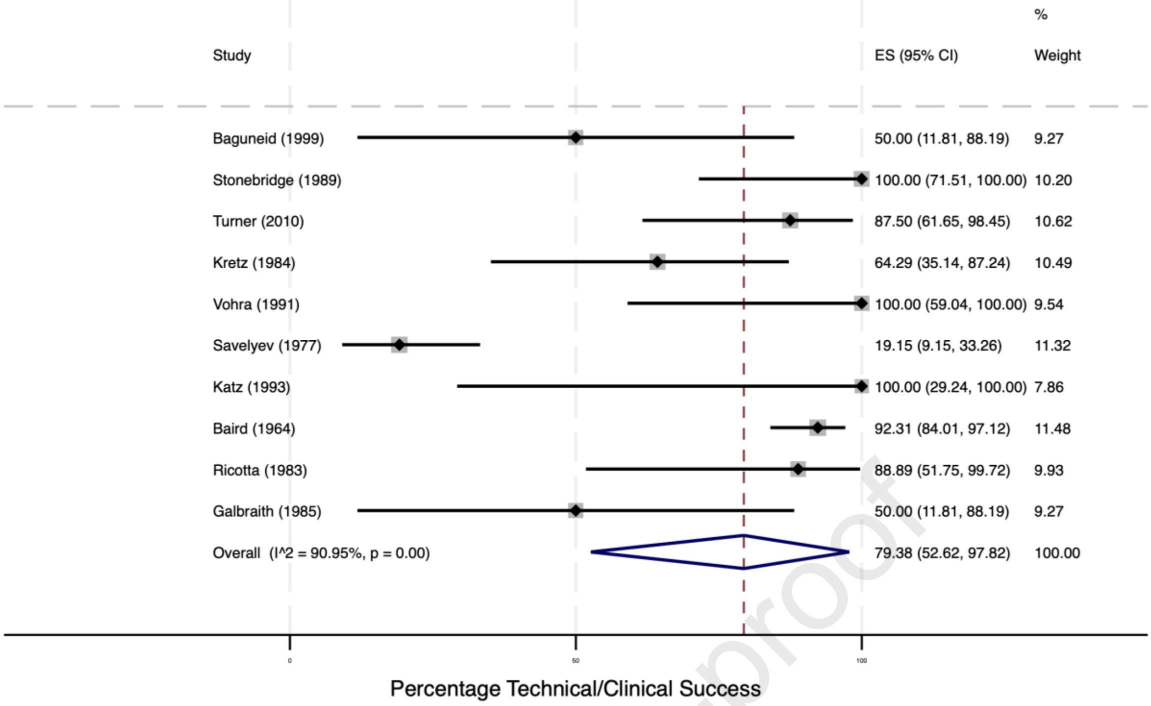
Figure 2– Forest plots demonstrating combined technical and clinical success of AULI management treated Surgically (A), Endovascularly (B) and Medically (C)



A. Surgical Management

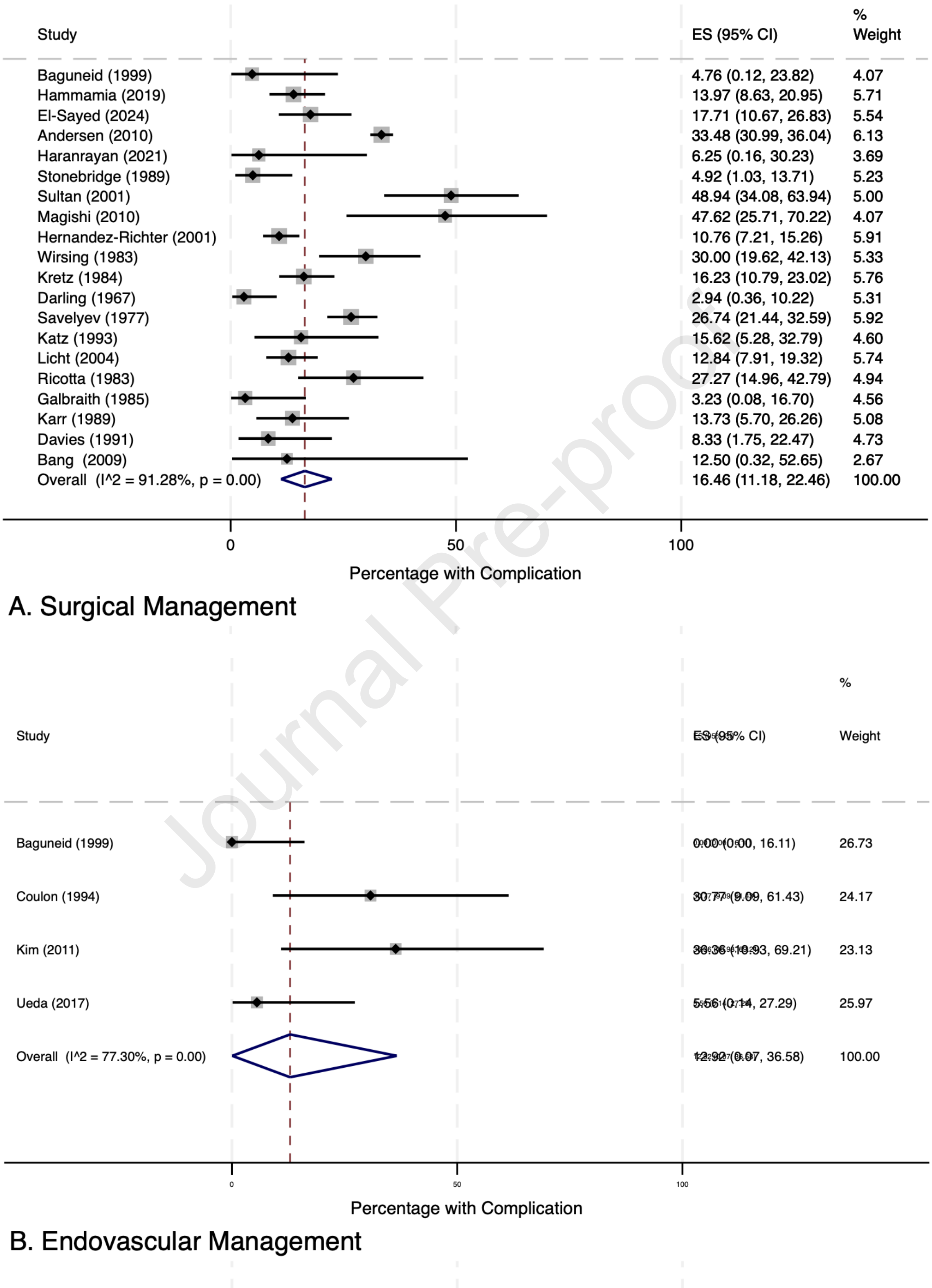


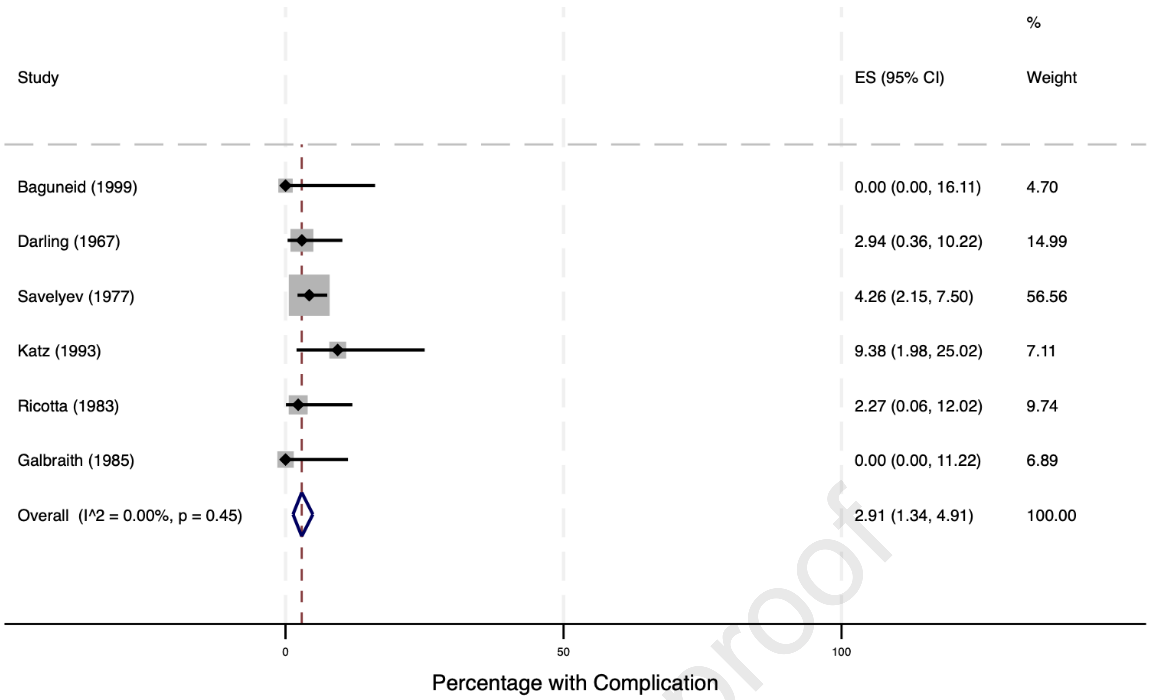
B. Endovascular Management



C. Medical Management

Figure 3– Forest plots demonstrating complication rates for AULI management treated Surgically (A), Endovascularly (B) and Medically (C)





C. Medical Management

Figure 4– Forest plots demonstrating success rates depending on the site of occlusion. Proximal = subclavian and axillary arteries. Mid= brachial artery. Distal= forearm and digital arteries.

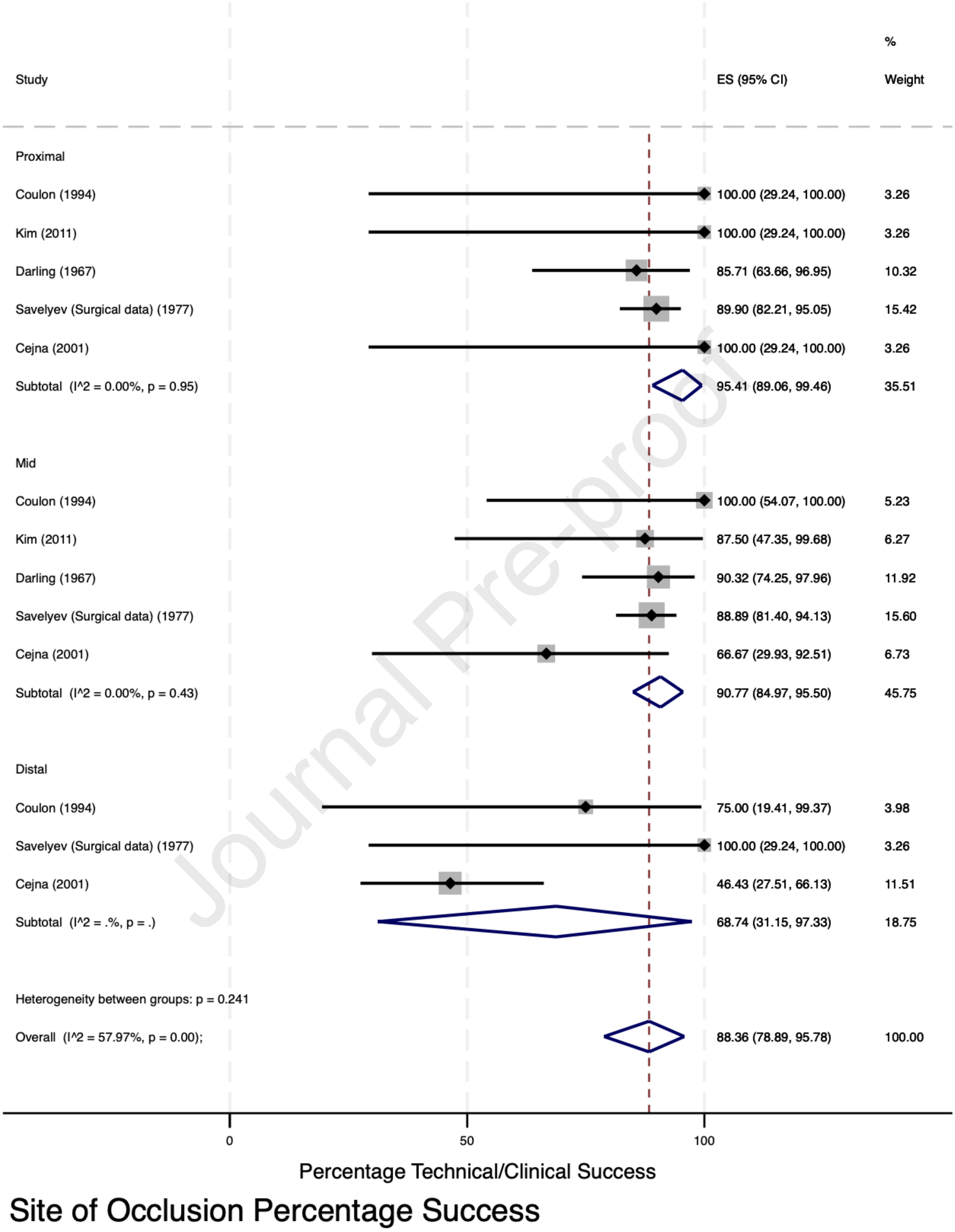


Figure 5– Risk of bias summary plot for all included studies using the Risk of Bias in Non-randomised Studies of Interventions (ROBINS-I V2) tool