

PEDICLED PERFORATOR FLAPS FOR HEAD AND NECK RECONSTRUCTION : A SYSTEMATIC REVIEW

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143
studies

1,704
patients

1,728
flaps

15
donor sites

95.6%
complete survival

BACKGROUND & OBJECTIVE

Pedicled perforator flaps have emerged as an alternative reconstructive option for small to medium defects in the head and neck. However, their **indications, reliability, and safety profile** have not been comprehensively evaluated.

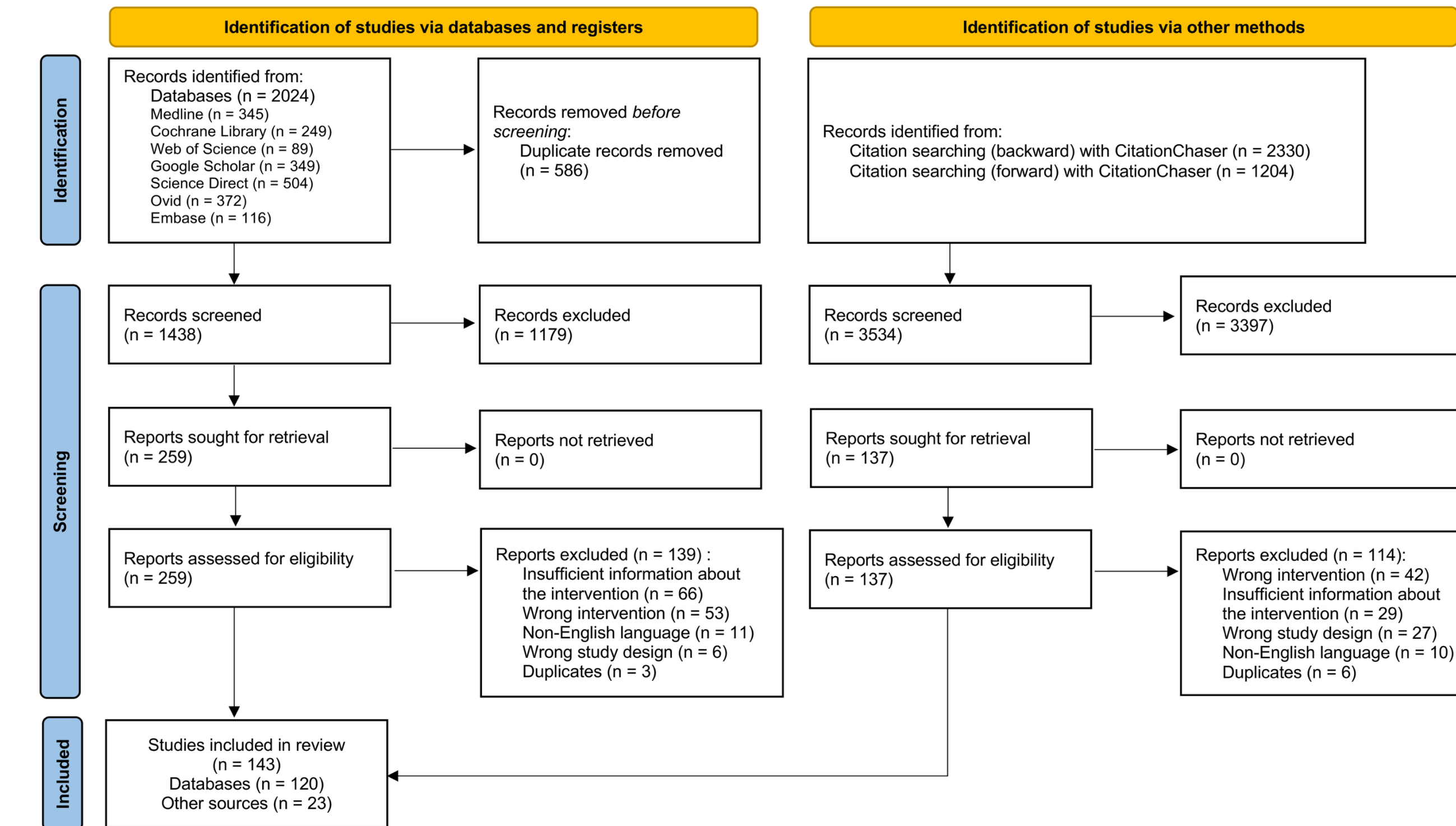
Objective : To evaluate the **clinical applications and flap safety** of pedicled perforator flaps in head and neck reconstruction through a PRISMA-compliant systematic review and meta-analysis

METHODS

- PRISMA-compliant systematic review; PROSPERO: CRD420251070635.
- Databases: MEDLINE, Embase, Web of Science, Cochrane Library, and additional sources (2005–2025).
- Included: original clinical studies reporting pedicled perforator flaps for head and neck reconstruction.
- Risk-of-Bias assessment : Oxford Centre for Evidence-Based Medicine Levels of Evidence criteria ; ROBINS-I V2
- Primary outcome: flap safety assessed by total and partial necrosis**
- Meta-analysis: random-effects GLMM for proportions with a logit link by flap subtype when ≥5 studies were available.

STUDY SELECTION

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases, registers and other sources



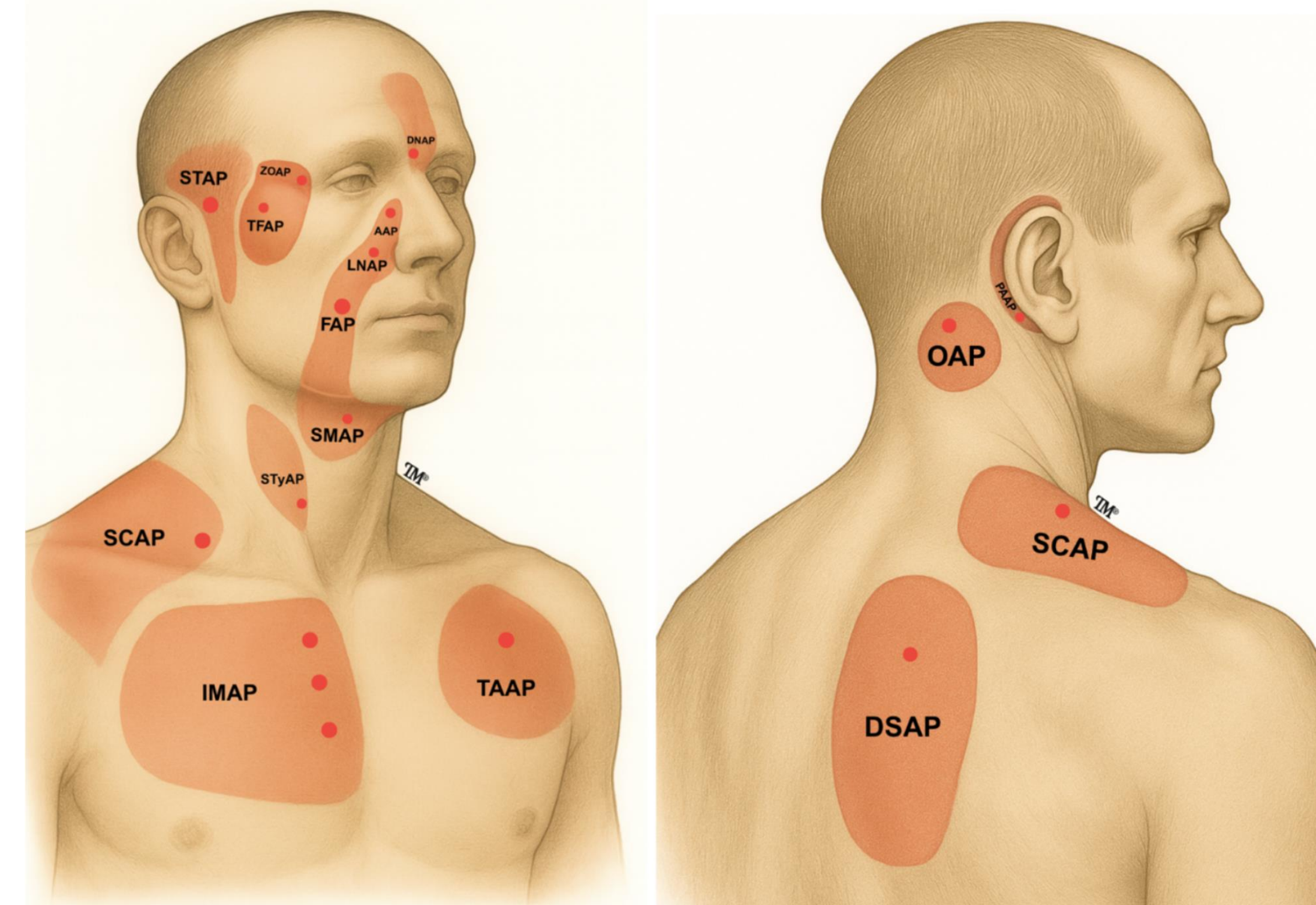
PRISMA flow diagram (n = 143 included studies).



DESCRIPTIVE RESULTS

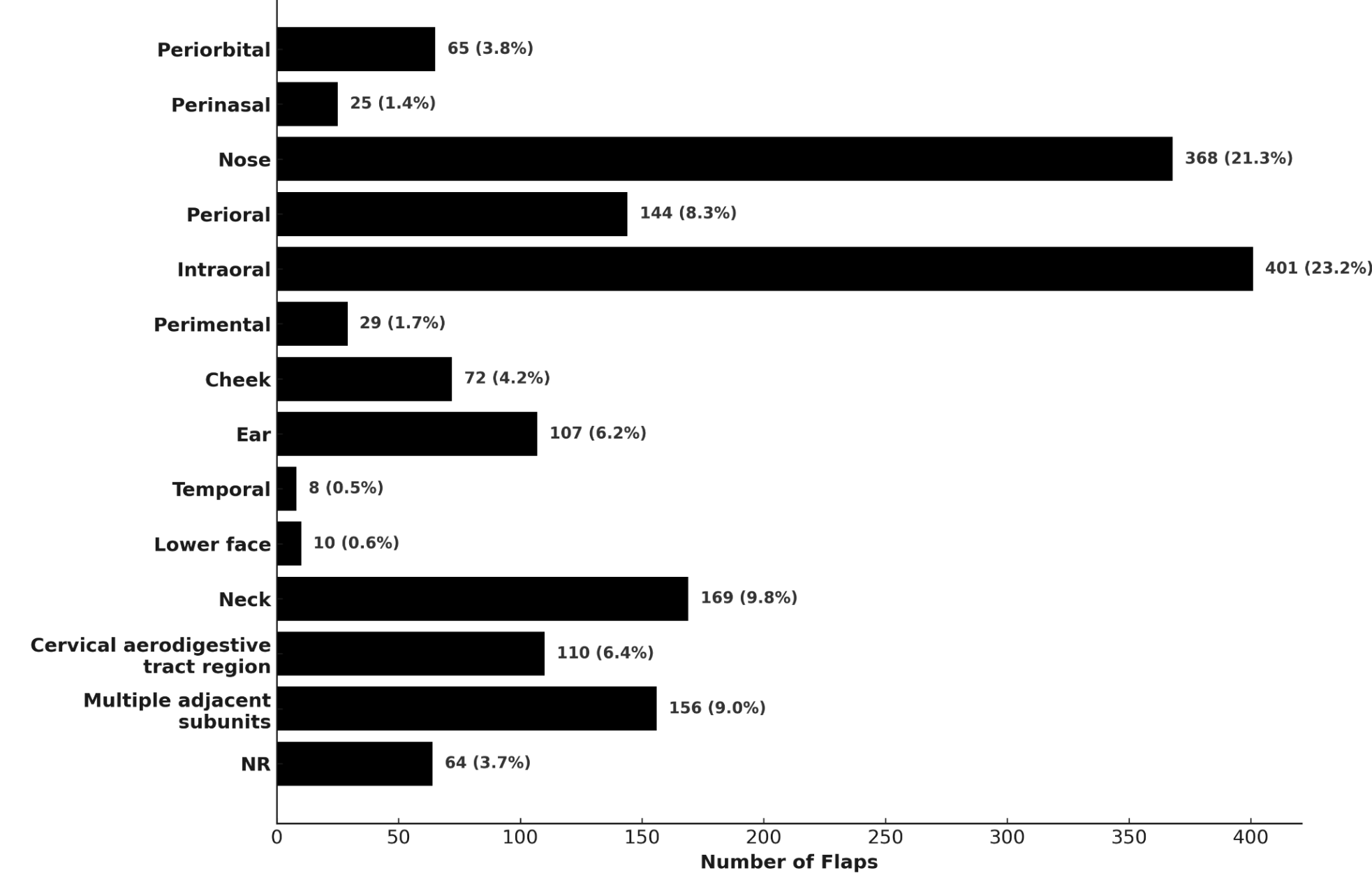
- 15 donor sites were identified: 9 in the head, 3 in the neck, and 3 in the thorax.
- Most frequent flaps: **FAP** (n = 547), **SMAP** (n = 286), and **SCAP** (n = 249).
- Most reconstructions followed **oncologic resection** (83.3%).
- Commonest defect sites were **intraoral** (23.2%) and **nasal** (21.3%).
- Mean flap surface area was **38.9 cm²**; primary donor-site closure was achieved in **93.2%**.

ANATOMICAL DISTRIBUTION OF DONOR SITES



FAP, facial artery perforator; **SMAP**, submental artery perforator; **SCAP**, superficial cervical artery perforator; **IMAP**, internal mammary artery perforator; **LNAP**, lateral nasal artery perforator; **STAP**, superficial temporal artery perforator; **STYAP**, superior thyroid artery perforator; **PAAP**, posterior auricular artery perforator; **TFAP**, transverse facial artery perforator; **TAAP**, thoracoacromial artery perforator; **DNAP**, dorsal nasal artery perforator; **AAAP**, angular artery perforator; **OAP**, occipital artery perforator; **ZOAP**, zygomatico-orbital artery perforator; **DSAP**, dorsal scapular artery perforator.

DEFECT SITE DISTRIBUTION

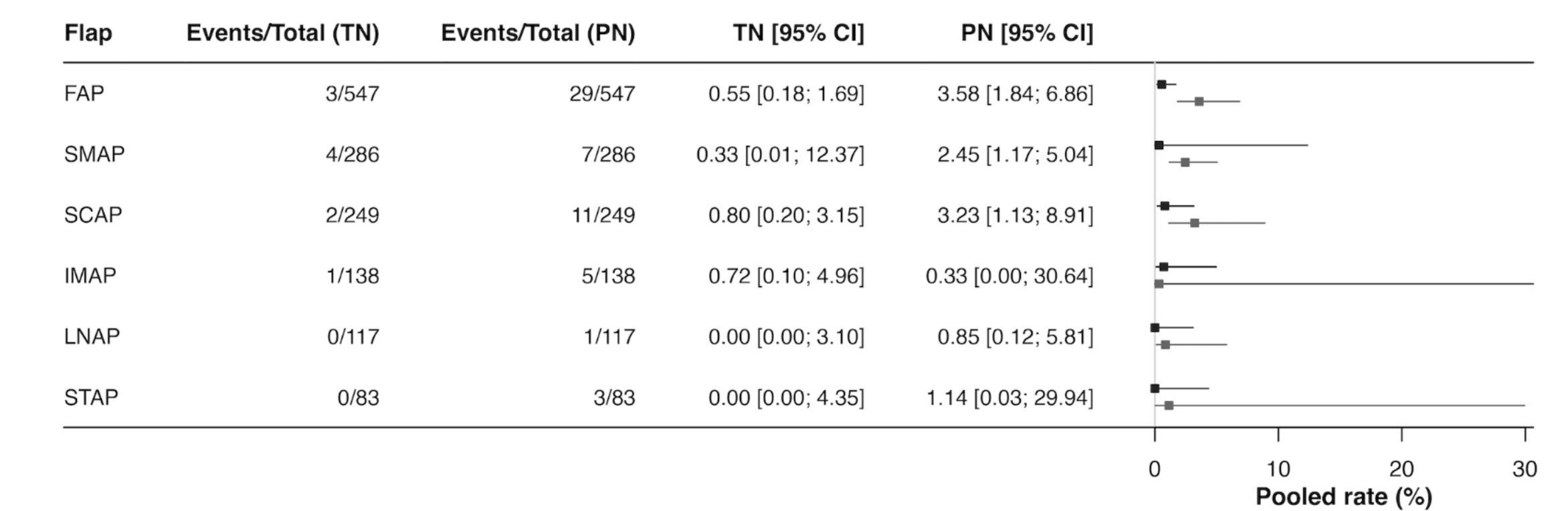


PERFORATOR LOCALIZATION & TYPE OF ROTATION

- Preoperative perforator mapping was performed in 62.3%** of flaps, mainly with **handheld Doppler** (51.3%) or color Doppler ultrasound (8.3%), computed tomography angiography was rare.
- In 35% of flaps, perforators were identified intraoperatively
- Propeller** (31.7%) and **islanded** (27.5%) designs were the most frequently reported configurations.
- V-Y advancement (9%) and transposition (8.7%) were less common.

META-ANALYSIS OF FLAP SAFETY

Pooled necrosis rates by flap subtype



MAIN QUANTITATIVE FINDINGS

- Overall complete survival: 95.6%**. Survival reached 100% for TFAP, TAAP, AAP, OAP, ZOAP, and DSAP.
- Total necrosis was rare in pooled analyses:** 0% for LNAP and STAP; highest pooled estimate 0.80% (95% CI 0.20–3.15) for SCAP.
- Partial necrosis ranged from 0.33% (95% CI 0.00–30.64) for IMAP to 3.58% (95% CI 1.84–6.86) for FAP.
- I² was 0% across model-based pooled analyses, whereas τ² and prediction intervals indicated residual uncertainty in sparse-event subgroups.

KEY FINDINGS

Pedicled perforator flaps are reliable

By moving beyond empirical length-to-width ratio rules, they provide greater versatility and plasticity in reconstruction

By enabling direct identification of the vascular pedicle, they enhance flap reliability

For large defects, local perforator flaps such as SCAP, IMAP, TAAP, or OAP can be alternatives to free flaps after pre-expansion or supercharging

By avoiding the inclusion of unnecessary lymphatic tissue, they may also improve oncologic safety

CONCLUSIONS

- Pedicled perforator flaps are reliable and versatile reconstructive options across a broad range of head and neck defects.
- They provide broad anatomical applicability, low total flap loss, and frequent primary donor-site closure.
- Future prospective comparative studies should clarify functional outcomes, aesthetic outcomes, and selection versus alternative reconstructive strategies

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