A Systematic Review of the Profunda Artery Perforator Flap in Head and Neck Reconstruction

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BACKGROUND

Flaps are routinely utilized in reconstructive surgeries following trauma, oncologic resection, or for aesthetic procedures. Flap selection is based on several factors to minimize donor site morbidity and functional loss while maximizing flap survival and recipient site functional restoration. The profunda artery perforator (PAP) flap is a lower extremity flap based on the profunda femoris artery which typically provides a large amount of tissue and consistent vascular anatomy.[1]

PURPOSE

While the anterolateral thigh flap and radial forearm free flap are mainstays for soft tissue head and neck reconstruction, the musculocutaneous PAP flap has gained popularity as an aesthetically pleasing and reliable option for breast reconstruction. However, it is yet to be widely applied in head and neck procedures. This systematic review highlights its utility and outcomes in head and neck reconstruction.

METHODS

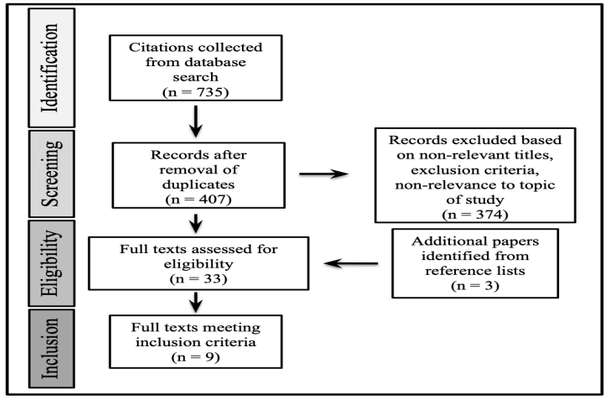

FIGURE 1: PRISMA Flow Diagram for Article Inclusion

- Search engines (January 1948 – February 2022): PUBMED, EMBASE, Web of Science, and Google Scholar
- Inclusion criteria: English language literature, at least 3 patients 18 years or older, head and neck reconstruction with PAP flap
- Exclusion criteria: non-English manuscripts without available translation, animal studies
- Primary outcomes: partial or complete flap failure, donor site morbidity, procedural complications
- Secondary outcomes: functional outcomes, comparison to other flaps, flap size, and recipient vasculature
- Patient demographics collected
- Quality of included studies assessed with MINORS criteria

RESULTS

- 735 articles identified, with 9 meeting inclusion criteria (2 case series, 5 retrospective studies, and 2 prospective studies)
- Total of 206 flaps across 205 patients with a mean age of 57.3 years
- Flaps were primarily performed for oncologic and trauma reconstruction with a 99% success rate
- Average flap size was 115.94 cm^2
- Overall surgical and medical combined complication rate was 33%
- Displayed good reconstructive outcomes
- Quality assessment suggested moderate to high risk of bias in all studies

TABLE 1: Summary of Selected Outcomes in Included Articles

	Study Type	Flaps, n	Patient Age, mean (years)	Flap Size, mean (cm^2)	Complete Flap Failures, n	Partial Flap Failures, n	Return to OR, n
Largo	retrospective	61	63	85.91	0	2	8
Iida	case series	7	70.29	147	0	0	0
Fernandez-Riera	retrospective	21	53.9	68.1	0	0	1
Wu	prospective	18	55.7	166.1	0	1	2
Ito	retrospective	48	53.3	153.23	0	6	4
Heredero	case series	10	53.9	87.3	1	0	2
Li	retrospective	6	48.3	136.83	0	1	0
Scaglioni	retrospective	23	56.7	117.6	1	0	1
Kehrer	prospective	12	53.5	120.04	0	0	4

DISCUSSION

- Low surgical complication rates across all studies
- Aesthetically pleasing donor scar site with highly pliable posteromedial thigh skin
- Limited study scope with only 9 total included articles
- Need for a randomized controlled trial to better analyze outcomes of PAP flaps

CONCLUSIONS

- PAP flap appears to be a safe, feasible, and favorable option for various head and neck reconstruction procedures with a reasonable complication rate
- Overall patient numbers in literature review remain limited; further research is warranted

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