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Superficial Temporal Vessels as Recipient Sites in Head and Neck Reconstruction: Clinical Outcomes From a Single-Center Retrospective Cohort Study

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Abstract

Background: The superficial temporal vessels represent an alternative recipient site for microvascular reconstruction of complex head and neck defects, particularly when cervical vessels are inaccessible or unsuitable. However, concerns regarding vessel caliber, venous drainage, and intraoperative reliability remain. This study aimed to evaluate clinical outcomes and technical challenges associated with the use of superficial temporal vessels in maxillofacial reconstruction.

Methods: A single-center retrospective study was conducted involving 20 consecutive patients in whom superficial temporal vessels were selected as potential recipient sites between January 2019 and December 2025. Patient characteristics, reconstructive techniques, recipient vessel selection, flap survival, intraoperative conversions, and postoperative complications were retrospectively assessed. Outcomes were analyzed descriptively.

Results: The superficial temporal artery was successfully used in 18 of 20 patients (90%, 18/20), with the superficial temporal vein providing venous drainage in 17 of these 18 cases (94.4%, 17/18). Two of 20 patients (10%, 2/20) required intraoperative conversion because of inadequate temporal venous caliber, one to cervical recipient vessels and the other to pedicled reconstruction. Among the 18 reconstructions utilizing the superficial temporal artery, one total flap loss occurred (5.6%, 1/18), resulting in a flap survival rate of 94.4% (17/18). Partial flap necrosis was observed in three. An additional total flap loss occurred following conversion to cervical vessels.

Conclusions: The superficial temporal vessels represent a feasible recipient option in selected complex maxillofacial reconstructions, with flap survival rates of 94.4% (17/18) among cases utilizing the superficial temporal artery and 89.5% (17/19) across all free flaps. Inadequate venous caliber remains an important cause of intraoperative conversion. Larger prospective multicenter studies incorporating standardized vessel assessment are needed to further define the clinical role of these recipient vessels.

Categories: Plastic Surgery, Otolaryngology, Transplantation
Keywords: microsurgery, reconstructive surgical procedures, surgical flaps, temporal arteries, treatment outcome

Introduction

Microvascular free tissue transfer represents the gold standard for reconstruction of complex maxillofacial defects, providing reliable restoration of both function and aesthetics after oncologic resection, trauma, or osteoradionecrosis [1,2]. Traditionally, free flaps are anastomosed to cervical recipient vessels, which offer consistent anatomy and accessibility [3]. However, the need to reduce operative exposure and morbidity, along with the increasing frequency of reconstructions in previously treated or anatomically challenging regions, has driven interest in alternative recipient sites beyond the neck [4]. Among these, the temporal vessels have emerged as a versatile extracervical option, particularly suitable for midface, orbital, and cranial reconstructions where cervical access is limited or undesirable [1,5].

The use of the superficial temporal artery and vein as recipient vessels was initially viewed with skepticism due to their smaller caliber, potential size mismatch with donor pedicles, and close relationship to facial nerve branches [1]. Additional concerns included limited flow capacity and the superficial course of these vessels, which was thought to predispose to kinking or external compression [6,7]. Nevertheless, previous anatomical and clinical studies have reported favorable vessel characteristics and reconstructive outcomes when superficial temporal vessels were used as recipient sites [5,8]. Reported flap survival ranges between 93% and 98%, supporting their safety and versatility in both primary and vessel-depleted reconstructions [1,9].

The temporal vessels are particularly advantageous in reconstructions of the midface, upper face, and cranial regions, where the required pedicle length may limit anastomosis to cervical vessels [3,10]. Their proximity to these anatomical zones allows for a shorter pedicle, reduced tunneling, and a more direct, tension-free anastomosis [1,8]. In addition, avoiding dissection in a previously treated or vessel-depleted neck minimizes operative morbidity and preserves cervical vessels for potential future procedures [9]. Furthermore, their consistent anatomy and ease of exposure through a limited preauricular incision make them a practical and aesthetically favorable option in carefully selected cases [5,11].

The present study aims to evaluate the feasibility and clinical outcomes of superficial temporal vessels as recipient sites in selected maxillofacial and craniofacial reconstructions, including midfacial, periorbital, and scalp defects. Specifically, we sought to describe flap survival, intraoperative conversion rates, and postoperative complications, with particular emphasis on the technical challenges associated with venous caliber variability. By presenting our single-center experience, we aim to contribute further clinical evidence regarding the practical limitations and appropriate selection of superficial temporal recipient vessels.

Materials And Methods

Study design and setting

We conducted a retrospective cohort study at the Department of Oral and Maxillofacial Surgery, Klinikum Dortmund, Dortmund, Germany. The study included patients treated between January 2019 and December 2025, with data collection completed on June 30, 2026, ensuring a minimum postoperative follow-up of six months for all included patients. The study focused on cases in which the superficial temporal vessels were selected as recipient sites for microvascular anastomosis, as well as those requiring intraoperative conversion to cervical vessels or to pedicled flaps when the temporal system was deemed unsuitable. All microvascular anastomoses were performed by the senior author (Christian Soemmer). This retrospective design was chosen as temporal vessels used in maxillofacial reconstruction remain infrequent and highly case-dependent, making prospective enrollment impractical. The study protocol received approval from the Institutional Review Board (IRB no. S-311/2025) and was conducted in accordance with the Declaration of Helsinki. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. The completed STROBE checklist is presented in the Appendix.

Patient selection

Patients were identified through a retrospective review of surgical records. All consecutive cases in which the superficial temporal vessels were considered for microvascular reconstruction during the study period were screened for eligibility. Patients were selected for temporal vessel assessment when conventional cervical recipient vessels were anticipated to be suboptimal due to prior neck surgery, radiation therapy, vessel depletion, or when the anatomical distance between the defect and the neck rendered cervical anastomosis technically unfavorable. Consequently, the superficial temporal vessels were explored as the primary option for microvascular anastomosis. Patients undergoing planned pedicled reconstruction without prior consideration of the superficial temporal vessels were excluded. The sample size was determined by the total number of eligible patients treated during the predefined study period (n = 20). No a priori sample size calculation was performed because the study was retrospective and descriptive, without a prespecified hypothesis test or comparative analysis.

Data extraction

Data were extracted retrospectively from operative reports, electronic medical charts, and follow-up documentation. The collected variables included patient demographics, comorbidities, etiology and anatomical location of the defect, and timing of reconstruction (primary or secondary). Flap-related parameters encompassed flap type and recipient vessel selection. The primary outcomes of interest were overall flap survival and the need for intraoperative conversion when the superficial temporal vessels were deemed unsuitable for reliable anastomosis. Secondary outcomes included wound-related complications such as dehiscence, hematoma, or infection. Total flap loss was defined as complete flap necrosis requiring removal, whereas partial flap necrosis referred to localized tissue loss without complete flap failure. The requirement for reoperation, including secondary procedures for contour refinement, was also recorded. Postoperative follow-up was conducted for a minimum of six months in all patients. Outcome measures were interpreted using consistent clinical criteria employed in our unit, allowing comparable assessment across all cases.

Surgical technique

All procedures were performed under general anesthesia, and microvascular anastomoses were carried out under the TIVATO surgical microscope (Carl Zeiss Meditec AG, Jena, Germany). Preoperative vascular mapping of the superficial temporal system was routinely conducted using CT angiography and handheld Doppler ultrasound to assess vessel course, caliber, and suitability for anastomosis. No predefined vessel diameter or flow thresholds were applied, and final vessel suitability was determined through intraoperative assessment. The superficial temporal artery and vein were exposed through a preauricular incision, and

vessel characteristics were reassessed intraoperatively. When adequate arterial diameter and pulsatile flow were confirmed, an end-to-end microvascular anastomosis was performed using 9-0 or 10-0 nylon sutures; no coupler device was used. In one case, the superficial temporal artery was combined with the internal jugular vein for venous drainage.

In cases where the superficial temporal vein appeared insufficient, either in caliber or flow, further dissection was carried out along the superficial temporal fascia. This plane was explored to identify an alternative venous branch within the temporal space, which in several cases can provide a more reliable option for anastomosis. If, despite extended venous exploration or arterial assessment, vessel dimensions or flow were deemed inadequate to support a stable anastomosis, conversion to a cervical approach or to a pedicled flap was performed. The decision to convert was made intraoperatively by the senior reconstructive surgeon based on the anticipated risk of venous congestion or arterial insufficiency. Flap perfusion and anastomotic patency were confirmed at the end of each procedure using indocyanine green (ICG) angiography.

Bias and missing data management

To minimize selection bias, all consecutive eligible patients treated during the study period were included without restriction regarding diagnosis, defect location, or flap type. Information bias was reduced through independent extraction of operative and postoperative data by two researchers, with discrepancies resolved by consensus. Standard definitions were used for all recorded outcomes to ensure comparability across the cohort. No imputation techniques were applied; missing or incomplete data were verified against original operative notes and follow-up documentation, and cases with irretrievable essential information were planned to be excluded from analysis. The single-center design and consistent operative team ensured technical consistency, although surgeon-dependent factors and limited generalizability must be acknowledged.

Potential confounding factors included patient comorbidities, prior neck surgery or irradiation, defect location and etiology, reconstructive timing, flap type, and recipient vessel availability. These factors may influence recipient vessel selection and postoperative outcomes. Given the small sample size, heterogeneity of the cohort, and absence of a comparator group, no multivariable adjustment or formal confounder analysis was performed. Accordingly, the findings were interpreted descriptively, without attributing differences in flap outcomes solely to recipient vessel selection. No patients were excluded due to missing or incomplete data.

Data analysis

Given the small sample size and descriptive nature of this study, no inferential statistical analyses were performed. Categorical variables were summarized as absolute frequencies (n) and percentages (%), while age was summarized using the mean. Flap survival was calculated using the number of surviving flaps divided by the number of flaps in the corresponding reconstructive group. No statistical hypothesis testing or multivariable adjustment was performed. The analyses were intended to describe clinical outcomes and intraoperative patterns rather than establish statistical associations or causal relationships.

Results

A total of 20 patients in whom the superficial temporal vessels were initially selected as potential recipient sites underwent maxillofacial reconstruction during the study period. The cohort consisted of eight males and 12 females, with a mean age of 64 years. Most reconstructions were performed following oncologic resection, predominantly for squamous cell carcinoma, while a smaller proportion of cases were related to benign tumors, flap failure, or infection-related defects. Defects were located primarily in the midface and periorbital regions, including the maxilla, canthus, nasal complex, and frontoparietal scalp. Most procedures were secondary reconstructions performed in previously treated surgical fields, often characterized by prior operations, radiation, or anatomical constraints limiting access to suitable cervical recipient vessels. These factors accounted for the frequent consideration of the superficial temporal vessels as primary candidate recipient sites.

Outcomes

A total of 20 reconstructions were performed, comprising 19 free flaps (95%, 19/20) and one pedicled flap (5%, 1/20). The anterolateral thigh (ALT) flap was the most frequently used flap type, accounting for eight reconstructions (40%, 8/20). Radial forearm flaps, anteromedial thigh flap, ulnar flaps, lateral arm flaps, latissimus dorsi flaps and the novel venous forearm flap were used in selected situations according to defect size, tissue requirements, and surgeon preference. The superficial temporal artery was used in 18 of 20 patients (90%, 18/20). Among these 18 reconstructions, the superficial temporal vein was used in 17 cases (94.4%, 17/18), while the internal jugular vein was used in one case (5.6%, 1/18). In two patients, the temporal system was deemed unsuitable intraoperatively due to inadequate venous caliber, necessitating a change in the reconstructive plan. One of these cases required conversion to cervical recipient vessels, whereas the other was completed using a pedicled flap when no reliable cervical option was available.

Among the 18 cases in which the superficial temporal artery was used as the recipient vessel, one total flap loss occurred (5.6%, 1/18), corresponding to a flap survival rate of 94.4% (17/18). Partial flap necrosis occurred in three of the 18 reconstructions using the superficial temporal artery (16.7%, 3/18). All three cases were managed with local debridement and/or revision procedures without subsequent total flap loss. An additional total free flap loss occurred following conversion to cervical recipient vessels. Overall, 17 of 19 free flaps survived (89.5%, 17/19), while the remaining patient underwent pedicled reconstruction. Minor postoperative complications, including wound dehiscence, contour irregularities, and the need for revision surgery, were documented but did not affect flap viability. Details of flap selection, recipient vessel choice, and intraoperative decision-making are presented in Table *1*.

Sex	Age (years)	Cause of Defect	Localization of Defect	Timing of Reconstruction	Flap	Recipient Vessels	Major Complications	Minor Complications
M	67	Oncologic Resection (SCC)	Lower eyelid / Infraorbital (R)	Secondary	Lateral arm flap	a./v. temporalis	-	-
F	86	Oncologic Resection (MAC)	Nose / anterior maxilla (R)	Secondary	RFF Flap	a./v. temporalis	-	-
M	50	Debridement (Necrotizing fasciitis)	Periorbital (L)	Secondary	ALT flap	a./v. temporalis	Partial flap necrosis	Dehiscence, Revision
F	57	Oncologic Resection (Meningeoma)	Parietal (L)	Primary	ALT flap	a./v. temporalis	Partial flap necrosis	Debridement, Contour revision
F	85	Oncologic Resection (SCC)	Medial canthus	Secondary	RFF flap	a./v. temporalis	-	-
M	41	Oncologic Resection (SCC)	Maxilla (L)	Secondary	ALT flap	a./v. temporalis	-	-
F	62	Oncologic Resection (ACC)	Maxilla / Palate (L)	Secondary	ALT flap	a./v. temporalis	Partial flap necrosis	Dehiscence, Debridement
F	43	Oncologic Resection (Meningeoma)	Frontoparietal (R)	Secondary	LD flap	a./v. temporalis	-	-
F	86	Oncologic Resection (BCC)	Frontotemporal (R)	Secondary	Venous Forearm flap	a./v. temporalis	-	-
F	60	Oncologic Resection (SCC)	Nasal base	Secondary	RFF flap	a./v. temporalis	-	Contour revision
F	63	Oncologic Resection / flap failure (SCC)	Upper lip, Maxilla, Hard palate	Secondary	Chimeric ALT flap	a./v. temporalis	Total flap necrosis - flap removal	-
F	43	Oncologic Resection / flap failure (SCC)	Frontoparietal (L)	Secondary	LD flap	a./v. temporalis	-	-
F	69	Oncologic Resection (SCC)	Zygomaticotemporal (R)	Primary	ALT flap	a. temporalis/ v. jugularis interna	-	-
M	81	Oncologic Resection (SCC)	Maxilla (L)	Secondary	AMT flap	a./v. temporalis	-	-
M	69	Oncologic Resection (Sarcoma)	Buccal area (L)	Primary	ALT flap	a./v. temporalis	-	-
M	67	Oncologic Resection (SCC)	Buccal area (R)	Primary	Lateral arm flap	a./v. temporalis	-	-
M	85	Oncologic Resection (MAC)	Nasal base	Secondary	Ulnar flap	a./v. temporalis	-	-
F	61	Oncologic Resection (SCC)	Frontal (L)	Secondary	ALT flap	a./v. temporalis	-	-
M	60	Oncologic Resection (SCC)	Maxilla	Secondary	PMMC flap	Pedicled	Temporal vessels not suitable - transition to pedicled flap	-

F	45	Oncologic Resection (BCC)	Midface	Secondary	ALT flap	a./v. facialis	Temporal vessels not suitable - transition to cervical vessels; Total flap necrosis	Reoperation - debridement - secondary reconstruction

TABLE 1: Patient Characterisics

Abbreviations: SCC: Squamous Cell Carcinoma; a./v.: artery/vein; MAC: Microcystic Adnexal Carcinoma; RFF; Radial Forearm Free (flap); ALT: Anterolateral Thigh (flap); ACC: Adenoid Cystic Carcinoma; LDF: Latissimus Dorsi Free (flap); BCC: Basal Cell Carcinoma; PMMC: Pectoralis Major Myocutaneous (flap)

Discussion

In this retrospective cohort of patients undergoing microvascular reconstruction of cranio-maxillofacial defects, our findings suggest that the superficial temporal vessels may represent a feasible recipient option in selected cases. The overall flap survival rate was 94.4%, with one total flap loss observed among the 18 cases in which the temporal vessels were used as recipient sites. In two patients, the temporal system was deemed as inadequate intraoperatively, one requiring conversion to cervical vessels and the other reconstructed with a pedicled flap, underscoring the importance of intraoperative vessel assessment and surgical adaptability. When considering all 19 free-flap reconstructions, including the case converted to cervical recipient vessels, overall flap survival was 89.5% (17/19). These descriptive outcomes fall within or near previously reported survival ranges, although direct comparisons are limited by differences in patient selection and study design. Postoperative complications included one total flap loss and three cases of partial flap necrosis among the 18 reconstructions using temporal recipient vessels. These findings suggest that the superficial temporal system may represent a feasible recipient option in selected maxillofacial reconstructions, particularly when cervical access is restricted, not possible, or undesirable.

The superficial temporal vessels may provide suitable recipient options for microvascular reconstruction in selected craniofacial defects, although anatomical variability, particularly in venous caliber, must be considered. As a terminal branch of the external carotid system, the superficial temporal artery follows a predictable course within the superficial temporal fascia, providing reliable accessibility for microvascular anastomosis. The accompanying vein also demonstrates anatomic consistency, particularly along its course adjacent to the parotid gland, where it maintains a stable diameter and orientation. This anatomical reliability facilitates straightforward dissection through a limited preauricular incision while minimizing the risk of injury to the facial nerve or adjacent structures [6,12].

From a reconstructive standpoint, the temporal vessels offer multiple advantages for scalp and midfacial reconstruction. Their proximity to the defect allows a shorter pedicle length, thus reducing the risk of kinking or compression [1,5,10]. Unlike cervical recipient sites, where neck mobility may predispose the vascular pedicle to bending or mechanical stress, the superficial temporal system lies outside the dynamic cervical region, potentially mitigating position-related pedicle compromise [13]. The preauricular approach provides excellent exposure and aesthetically favorable scars that can be concealed within natural skin creases. In scalp reconstruction, the superficial temporal system allows simultaneous flap inset and vessel preparation within the same operative field, reducing operative time. For midfacial and orbital defects, their position permits a direct, tension-free anastomosis, particularly when the pedicle length limits cervical reach [8,11]. These anatomical and technical advantages make the superficial temporal vessels a practical and versatile recipient option in selected cranio-maxillofacial reconstructions.

Beyond their favorable anatomical characteristics, the temporal vessels offer distinct clinical advantages over the traditional cervical approach. Neck dissection carries well-recognized morbidity, including risk of neurovascular injury, chyle leak, hematoma formation, and prolonged operative time-complications that are amplified in previously dissected or irradiated fields [4,14]. In contrast, vessel preparation in the temporal region is performed in a superficial and relatively undisturbed plane, potentially reducing operative trauma and postoperative morbidity [15]. Importantly, the superficial temporal artery and vein remain outside the zone of prior surgery or radiation, making them a dependable option in vessel-depleted necks where fibrosis or scarring can compromise cervical vessel availability [5,9]. Furthermore, by avoiding the cervical field, this strategy preserves neck vessels for future reconstructions or oncologic interventions, a critical consideration in patients with recurrent or progressive disease [5].

In this cohort, only one total flap failure occurred when the superficial temporal vessels were used, supporting their reliability as recipient sites following appropriate intraoperative evaluation. Two intraoperative conversions were required because the temporal recipient vessels were deemed unsuitable. One of these cases subsequently developed total flap necrosis. This emphasizes that careful inspection and early decision-making are central to achieving predictable outcomes. Postoperative complications included one total flap loss and three cases of partial flap necrosis among reconstructions involving the superficial temporal artery. Our findings are consistent with previous reports that document high flap survival rates when temporal vessels are selected judiciously [1,8,16]. These observations highlight the potential importance of intraoperative vessel assessment and the ability to modify the reconstructive plan when

temporal recipient vessels are unsuitable.

From a technical perspective, venous management remains the most challenging step when relying on the superficial temporal system. Although the artery is generally predictable in diameter and trajectory, the accompanying vein displays notable variability in its course, caliber, and branching pattern, particularly superior to the zygomatic arch [6,12,17]. The vessel may be small, inconsistently positioned, or occasionally concealed within the parotid tissue, complicating its exposure and limiting its suitability for microvascular drainage. When no reliable superficial vein is identified, further dissection into the temporal region can uncover the deep temporal venous system, which represents a viable alternative in selected cases [18]. In our cohort, both intraoperative changes in reconstructive strategy resulted from inadequate venous caliber, underscoring the need for meticulous venous assessment before committing to this recipient site. Additionally, if conversion to cervical vessels becomes necessary, the pedicle must be prepared with sufficient length to reach the neck without tension. Thorough preoperative planning and the readiness to adjust intraoperatively are therefore central to preventing ischemic complications and safeguarding flap viability [18].

In summary, this single-center retrospective cohort suggests that the superficial temporal vessels may represent a feasible recipient option for selected maxillofacial reconstructions, with a flap survival rate of 94.4%. The observed outcomes suggest the potential clinical utility of this approach, although its safety and reproducibility require further investigation. The main limitations of this study include its retrospective design, relatively small sample size, absence of a comparator group, and single-surgeon experience, which limit the generalizability of the findings. Nevertheless, the consistent surgical technique and incorporation of intraoperative perfusion assessment provided a standardized approach to reconstruction within this cohort. Future research should focus on prospective, multicenter analyses with larger cohorts and standardized outcome measures to better define the indications, contraindications, and long-term performance of the superficial temporal system as a recipient site.

Limitations

This study has several limitations. First, its retrospective, single-center design and small sample size (n = 20) limit the generalizability of the findings. Second, the absence of a comparator group prevents direct evaluation of outcomes against reconstructions using conventional cervical recipient vessels. Third, the heterogeneity of patient characteristics, defect locations, flap types, and previous treatments introduces potential confounding factors that could not be formally adjusted for. Additionally, recipient vessel selection was based on intraoperative clinical assessment, introducing the possibility of selection bias. Furthermore, the single-surgeon experience may introduce operator-dependent effects, including a potential learning curve, which could influence the reproducibility of these findings across different surgical teams. No inferential statistical analyses were performed; therefore, the reported outcomes should be interpreted as descriptive observations rather than evidence of superiority or equivalence. Larger, preferably multicenter comparative studies are needed to further evaluate the clinical outcomes associated with superficial temporal recipient vessels.

Conclusions

In summary, this single-center retrospective cohort suggests that the superficial temporal vessels may represent a feasible recipient option for selected maxillofacial reconstructions, with a flap survival rate of 94.4%. The observed outcomes suggest the potential clinical utility of this approach, although its safety and reproducibility require further investigation. The main limitations of this study include its retrospective design, relatively small sample size, absence of a comparator group, and single-surgeon experience, which limit the generalizability of the findings. Nevertheless, the consistent surgical technique and incorporation of intraoperative perfusion assessment provided a standardized approach to reconstruction within this cohort. Future research should focus on prospective, multicenter analyses with larger cohorts and standardized outcome measures to better define the indications, contraindications, and long-term performance of the superficial temporal system as a recipient site.

Appendices

STROBE Item	How Our Study Addresses It
1. Title & Abstract	The title specifies the study as a retrospective cohort. The abstract is structured and includes the background, aim, methods, key findings, and conclusions.
2. Background / Rationale	The introduction explains the established role of microvascular free flap reconstruction and the rationale for evaluating superficial temporal vessels as an extracervical recipient option.
3. Objectives	The study objective is clearly defined: to describe clinical outcomes, feasibility, and intraoperative challenges associated with using the superficial temporal vessels as recipient vessels in maxillofacial reconstruction.
4. Study	The retrospective cohort design is explicitly stated. The study period, setting, and microsurgical context are clearly

Design	described.
5. Setting	Conducted at a tertiary referral center in Germany between January 2019 and December 2025, with all cases treated by the same reconstructive team, ensuring procedural consistency.
6. Participants	Inclusion criteria: patients undergoing microvascular free flap reconstruction in whom the superficial temporal vessels were assessed as potential recipient sites.
7. Variables	Key variables included patient demographics, defect etiology and location, flap type, and recipient vessel selection. Primary outcomes: flap survival and intraoperative conversion. Secondary outcomes: wound-related complications and need for revision procedures.
8. Data Sources / Measurement	Data collected from operative notes, electronic medical records, and follow-up assessments.
9. Bias	Selection bias minimized by including all consecutive eligible patients. Information bias reduced through independent dual data extraction and verification against source documents. Surgeon-dependent bias mitigated as all anastomoses were performed by the same senior author.
10. Study Size	The study size reflects all consecutive eligible patients during the defined period; no power calculation was required due to the descriptive design.
11. Quantitative Variables	Descriptive statistics reported as absolute values. Mean age provided for demographic context. No imputation performed for missing values.
12. Statistical Methods	No inferential statistics were applied due to small sample size and observational aims; outcomes are presented descriptively.
13. Participants (Results)	Total number of included patients reported; reasons for exclusion specified in the methodology.
14. Descriptive Data	Baseline demographics, flap types, etiology, and defect locations comprehensively reported.
15. Outcome Data	Primary and secondary outcomes presented numerically, including flap survival, partial necrosis, complications, and intraoperative conversions.
16. Main Results	Findings contextualized within existing literature and interpreted according to the study aims.
17. Other Analyses	No subgroup or sensitivity analyses were undertaken due to the limited sample size.
18. Key Results (Discussion)	Discussion integrates the findings with previously published evidence regarding the utility of temporal vessels as recipient sites.
19. Limitations	Acknowledges retrospective design, limited cohort size, and absence of a control group as constraints on generalizability.
20. Interpretation	Clinical relevance emphasized, focusing on when temporal vessels can be safely used and when conversion may be necessary.
21. Generalizability	External applicability discussed in the context of centers performing advanced head and neck microvascular reconstruction.
22. Funding / Conflicts	No external funding; authors declare no conflicts of interest.
23. Ethical Approval	Approved by the Institutional Review Board with waiver of informed consent due to the retrospective nature of the study.

TABLE 2: Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Checklist

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Evangelos N. Vitkos, Konstantinos Kotzagiorgis, Lars Bonitz, Stefan Hassfeld, Christian Soemmer

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Supervision: Evangelos N. Vitkos, Christian Soemmer

Acquisition, analysis, or interpretation of data: Lars Bonitz, Stefan Hassfeld, Christian Soemmer

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. Ethics Commitee of Witten/Herdecke University issued approval IRB no. S-311/2025. **Animal subjects:** All authors have confirmed that this study did not involve animal subjects or tissue. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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