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Research Article

Efficacy of Platysmal flap for Surgical Defects Reconstruction in Oral Submucous Fibrosis: A Literature Review

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Abstract

Background: The platysma myocutaneous flap is a promising reconstructive option with a number of potential benefits. The flap's vascularity is quite dependable because it contains both muscle and skin. Esthetic superiority makes it advisable to be used in younger age group.

Objectives: To evaluate the efficacy of using Platysma flap for reconstruction of surgical defects in oral submucous fibrosis.

Data Sources: Using the PRISMA guidelines, a comprehensive and systematic search was done to identify evidence on literature related to surgical reconstruction of oral submucous fibrosis using platysmal myocutaneous flap. The search was carried out using the Medical Subject Headings (MeSH) terms: phrases "Platysmal myocutaneous flap" and "Oral submucous fibrosis".

Result: Five of the 21 study articles that were found through the literature search were used in this review after being chosen based on predetermined eligibility criteria. The review showed that platysmal flap is an esthetically superior option for reconstruction of intraoral defects created by oral submucous fibrosis with minimal complications.

Discussion: This systematic literature analysis demonstrated that due to these large benefits and minor negatives platysma myocutaneous flap may possibly assume a key role in surgical management of oral submucous fibrosis. Unaffected Facial esthetics without causing commissure expansion and a pinched lip appearance, hidden scars behind collars and superior patient compliance add to its advantages. Although there is some variability in thickness of platysma and length of the patient's neck, its arc of rotation, thinness and pliability makes it a beneficial reconstruction choice.

Keywords: Platysmal myocutaneous flap; Oral submucous fibrosis; Patient compliance; Surgical; Quality assessment techniques

Introduction

Platysmal myocutaneous flaps have been used historically since 1887, when Austrian surgeon Robert Gersuny reported reconstructing a cheek defect of full thickness using a cervical skin/plastysma flap that was inward rotated to make a new buccal mucosal lining. But it wasn't popular until 1978 when Futrell et al. [1] presented the platysma myocutaneous flap as a desirable reconstructive approach with a number of benefits [2]. The platysmal myocutaneous flap is basically a pedicled flap based on axial pattern that can enhance the reconstructive options of head and neck surgeons and offer a compelling choice with a number of potential benefits [3]. The flap's vascularity is quite dependable because it consists

of both muscle and skin. It allows for complete reconstruction in a single surgical step, and the precise amount of tissue required may be planned without running the potential risk of introducing too little or too much tissue into the Oro-facial region [4]. Additionally, local intraoral flaps are avoided as they may impair speech, deglutition, and denture fitting. Furthermore, the donor site can be approximated primarily with little donor deformation, and the entire procedure can be completed quickly without the requirement for specialised microvascular expertise [5]. Thus, it can be hypothesised that the platysmal myocutaneous flap may be able to play a big role in head and neck reconstruction because of these important advantages and negligible drawbacks [1]. The present study is aimed to assess the efficacy of using platysmal flap in surgical management of oral submucous fibrosis.

Materials and Methods

Search strategy

The PICOT format was used to define the research question. Patients with oral submucous fibrosis who are having fibrous band resection and platysmal myocutaneous flap reconstruction are the target population for this study. In accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement criteria, a systematic review was conducted. The Cochrane Database of Systematic Reviews (CDSR), PubMed/MEDLINE, Scopus, and the Cochrane central register of controlled trials (CENTRAL) were the electronic databases that were consulted. The articles included discussed the evaluation of the surgical results of platysmal myocutaneous flaps used for intraoral reconstruction after surgical excision of fibrous bands in cases of oral submucous fibrosis. All relevant abstracts were evaluated after the exclusion criteria were applied, and the full texts of the chosen publications were acquired. In order to identify any papers that could be included in the study, the references of the chosen articles were also examined. The flow diagram for the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method is depicted in Figure 1.

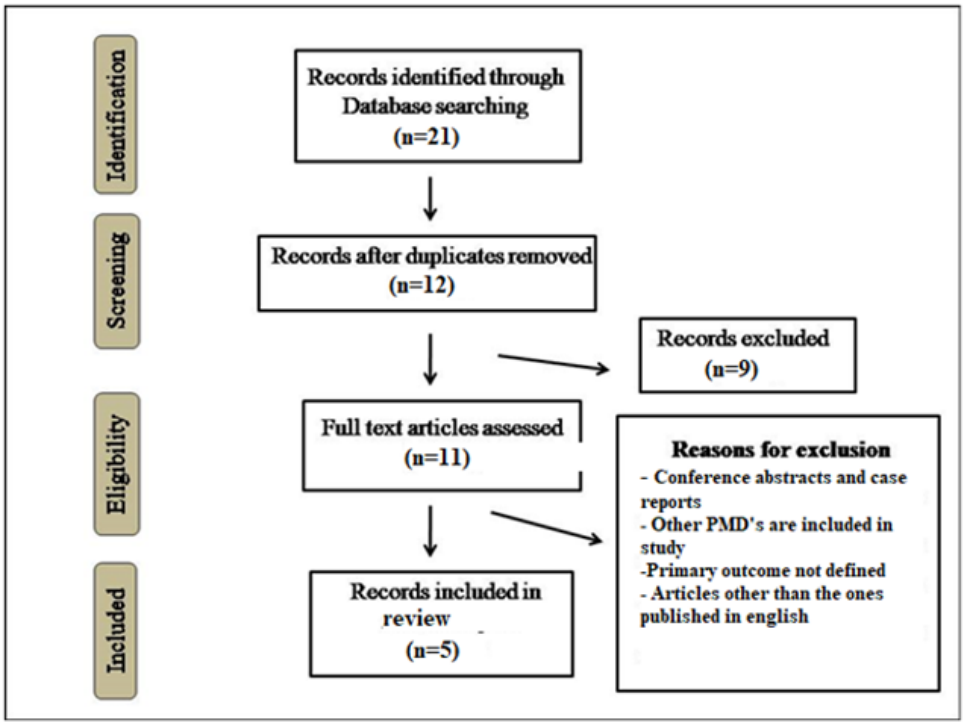

Figure 1: Flow diagram of articles screening and selection process for studies. Arrows represent the step-wise process.

Search terminologies

Medical Subject Headings (MeSH) terms from the National Library of Medicine (NLM) were chosen and used alongside text words. The MeSH phrases "Platysmal myocutaneous flap," and "oral submucous fibrosis" were utilized to give a systematic approach to access information when more than one author used different terms for the same idea.

Inclusion criteria

The Medical Subject Heading (MeSH) terms used for the search included Platysma, and oral submucous fibrosis. Only the articles published in English were included in the study. Patients who had undergone surgery for Stage III and IV oral submucous fibrosis and had undergone reconstruction with platysmal myocutaneous flap were included in the study.

Exclusion criteria

Articles that reported on the outcomes based on cadaver studies, and animal studies, as well as research that did not provide a specific statement of our primary outcome, studies in which other potentially malignant disorders, carcinomas were managed with

platysmal flap were excluded. Articles written in languages other than English were not considered. Duplicate articles, interviews, commentaries, conference abstracts and case reports were not accepted.

Data extraction and management

All data extracted was input into a predefined Microsoft Excel sheet (Microsoft Inc., Redmond, WA, USA). A data extraction form was used to extract the following data: Name of the authors, year of publication, number of patients, mouth opening-postoperative, flap dehiscence, partial flap loss, skin loss, other complications and conclusion. All disputes were resolved by a third reviewer.

Result

Nine articles from PubMed using the advance search method using a combination of regular keywords and MeSH terms, three from the Cochrane Library, and nine from Scopus using the regular keywords were among the 21 relevant articles that were located. Twelve article's titles and abstracts were checked after duplicate articles were removed. Just 12 of the examined articles were pertinent to this line of inquiry. These twelve articles were ultimately chosen for evaluation. Six of them did not match the inclusion requirements, and one was inaccessible, thus only five were included in our study. Using standardised quality assessment techniques, we evaluated five papers for quality evaluation; following the quality appraisal, all publications were qualified. Figure 1 displays the literature's PRISMA flowchart and the studies' search methodology. According to most research, platysmal flap is a technique sensitive alternative that can be used for reconstruction after surgical excision of fibrous bands in Stage 3 and Stage 4 Oral submucous fibrosis (Table 1).

Table 1: Efficacy of platysmal flap for surgical defects reconstruction in oral submucous fibrosis.

Sl.No	Author	Year	Study Design	Article Title	No. of Cases	Postop Mouth Opening	Partial Flap Loss	Dehiscence	Skin Loss	Other Complications	Conclusion
1	Chandrashekhar Bande, Ajit Joshi, Mayur Gawane, Manish Tiwari, Vijay Rode	2018	Prospective study	Utility of superiorly based platysma myocutaneous flap for reconstruction of intraoral surgical defects: Our experience [1]	47	42.5mm (2 years)	4	3	0	Nil	Platysmal flap can be efficiently used for intraoral reconstruction with minimal complications.
2	Sathyanarayann Ramanujam, Suresh Venkatachalam, Monica Subramaniyan and Deepika Subramaniyan	2015	Prospective study	Platysma myocutaneous flap for reconstruction of intraoral defects following excision of oral sub mucous fibrosis: A report of 10 cases [2]	10	NM	0	0	1(Partial skin loss)	1(Venous congestion)	Partial skin loss healed by secondary intention; venous congestion resolved within 48 hrs. No flaps failed, and all patients had overall good cosmetic results with no donor site morbidity.
3	Chandrashekhar R. Bande, Abhay Datarkar, Neeraj Khare	2012	Comparative study	Extended nasolabial flap compared with the platysma myocutaneous muscle flap for reconstruction of intraoral defects after release of oral submucous fibrosis: A comparative study [3]	10	41mm (1 Year)	2	NM	NM	No relevant complications mentioned	Platysma muscle flap was recommended as facial aesthetics are not compromised, scars hidden underneath the collars and good patient compliance. The risks of broadening of the commissure and a pinched appearance of the lips are avoided.
4	Wahen bam Tulsidas Singh, Nitin Bhola, Deepak N Singh, Anchal Agarwal,Potsangbam Aparna Devi and Kiran Kumar Aheibam	2024	Retrospective sudy	A retrospective study comparing the surgical results of platysma myocutaneous flap, buccal pad of fat, and nasolabial flap for reconstruction after fibrotomy in cases of oral submucous fibrosis [4]	16	39.34±4.14 (1 year)	3	NM	NM	No relevant complications mentioned	They have mentioned nasolabial flap as the most promising one.
5	B. C. Sikkerimath, Satyajit Dandagi, Aditya Anshu and Anu Jose	2021	Retrospective study	Comparative evaluation of reconstructive methods in oral submucous fibrosis [5]	10	34.5mm (6 months)	NM	2	NM	Total flap failure:4	Compared to other flaps, postoperative complications is more associated with platysmal flap and requires sensitive technique for success.

Discussion

Since 1978, intraoral reconstruction has been accomplished using the platysma myocutaneous flap. While some experts have questioned the widespread usage of this flap, others have documented excellent results. Virens observed a high prevalence of wound complications and evaluated functional results following repair using the platysma myocutaneuos flap [6]. PMF can be inferiorly, posteriorly, or superiorly based; superiorly based flaps are typically used to restore face and oral abnormalities [7]. The branch of facial artery, "submental artery", provides the platysma myocutaneous flap with a substantial blood supply. Other sources of blood supply include the transverse cervical, occipital thyroid, and post-auricular veins [6] Additionally, the mental, sublingual and sublingual arteries have substantial nasolabial and cheek arterial anastomoses, and retrograde filling does take place following proximal ligation of the facial artery. Because of this, the platysma flap can be employed following radical or functional neck dissection [6].

The submental artery serves as a feeder for the platysma myocutaneous flap's superiorly based design [8]. The flap should be raised following facial artery identification, preserving its continuity through meticulous dissection of the blood vessel's intraglandular trajectory [9]. The medial and superior aspects of the platysma muscle contain the anterior aspect of the facial artery. Maintaining the submental artery's patency is essential for maximising the viability of the superiorly based platysma flap [10]. The platysma muscle is reached by the superior thyroid artery near the sternocleidomastoid muscle's anterior border in the middle part of the neck [11]. These results show that maintaining a healthy occipital artery while maintaining the sternocleidomastoid muscle is the basis for the posteriorly base design of the platysma myocutaneous flap [8].

Additionally, adequate venous drainage is essential for flap survival [12]. The external jugular and submental veins serve as the primary venous drainage channels for platysma muscle. Therefore, it is important to protect these vessels as much as possible, and this is simple to do [6]. Due to the vertical venous drainage pattern, which is mostly composed of superficial veins, especially the facial, anterior, and external jugular veins, the platysmal flap is more vulnerable to congestion than arterial insufficiency and should not be torqued on an axis, tensed, or knicked [6]. While raising a platysmal flap, it is advisable to maintain the integrity of facial artery. However, even when the ipsilateral facial artery is ligated, the flap could usually survive well [3].

The flap can be used either superiorly or posteriorly based. So, they can provide sufficient amount of pliable soft tissue that can be used for reconstruction of small to medium sized skin or mucosal defects of oral cavity [6]. Superior colour matching, easy donor site access from the operating field, low morbidity of donor site, ease of closing the donor site primarily, and an appropriate thickness of flap for oral deformities are some of the benefits of the PMF [3]. Total or partial necrosis of the skin island, hematoma, fistula, dehiscence, and cellulitis are among the problems that might arise while using this flap; their rates range from 18% to 45% [6].

Venous congestion is one of the main complication of using a superiorly based Platysma Myocutaneous Flap (PMF). The major venous drainage of platysmal muscle is through the external jugular and submental veins. Maximum attention should be taken to conserve these vessels [6]. The Relative contraindications of using platysma flap in reconstruction include prior neck irradiation or neck dissection, ligation of facial artery. These parameters are mostly associated with impaired perfusion post operatively and is thought to be an important factor that is responsible for an increased flap failure rate [2].

Conclusion

Platysmal flap can be an efficient reconstructive option with minimal complications particularly in young age group where scarring is unacceptable. Although, the procedure is technique sensitive, the result yielded is superior and can be successfully used even in medically compromised patients. To further assess the efficacy of platysmal myocutaneous flap in the surgical treatment of oral submucous fibrosis, multicenter research including bigger patient groups are required.

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