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Review Article

Surgical treatment of oral submucosal fibrosis

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ABSTRACT

Oral submucosal fibrosis is a serious condition that might be associated with serious complications in the affected patient. The disease also represents a major challenge to the healthcare specialists and the patient before achieving proper management of the condition. Different pharmacological and surgical interventions have been validated. However, no single modality has been proved as an adequate management approach for the disease, which is probably due to the limited number of investigations in this concern and the limited knowledge about the pathogenesis of the condition. In the present literature review, we have discussed the different surgical approaches that have been reported in the literature for managing patients with oral submucosal fibrosis. These approaches mainly aimed to remove the fibrous bands in the oral cavity and maintain adequate mouth opening. It should be noted that it would be hard to write a solid conclusion in this concern because most of the current evidence was either lacking or obtained from a limited number of studies with no proper sample sizes or adequate follow up durations. Accordingly, the indication of the surgical intervention should be primarily done by the surgeon based on the degree of involvement of the oral cavity. Finally, we recommended that further comparative investigations be carried out to further demonstrate the most appropriate management modality and to rule out whether pharmacological or surgical modalities are more efficacious in these settings.

Keywords: Surgery, Oral submucosal fibrosis, Management, Treatment, Grafting

INTRODUCTION

Oral submucosal fibrosis is a serious condition that might be associated with serious complications in the affected patient. The disease also represents a major challenge to the healthcare specialists and the patient before achieving proper management of the condition. Severe mental illness and physical disorders can result secondary to the condition, which might impair the affected patient's

overall health status and quality of life.[1,2] Social life can also be adversely impacted as a result of the limited practice or oral hygiene measures due to restricted mouth opening.[1,2] Therefore, diagnosis and management of the condition should be adequately established and conducted before the emergence of these complications.

Many treatment modalities have been reported among the different studies in the literature, which have mainly been proposed to reduce or remove the fibrotic tissues that represent the main characteristic of the condition.[3] In this context, different pharmacological and surgical interventions have been validated.[4] However, no single modality has been proved as an adequate management approach for the disease, which was probably due to the limited number of investigations in this concern and the limited knowledge about the pathogenesis of the condition.[3,5] Accordingly, our study aimed to discuss the surgical approaches that might be used to treat oral submucosal fibrosis.

Methods

This literature review was based on an extensive literature search in Medline, Cochrane and EMBASE databases which was performed on 3 September 2021 using the medical subject headings (MeSH) or a combination of all possible related terms. This was followed by the manual search for papers in Google Scholar while the reference lists of the initially included papers. Papers discussing the occupational asthma were screened for relevant information, with no limitation placed on date, language, age of participants or publication type.

DISCUSSION

Evidence indicated the validity of different surgical approaches for the successful management of oral submucosal fibrosis. The main indication to conduct a surgical intervention in these patients and not use the various medical treatment modalities that have been adequately validated in the literature was developing trismus, with a mouth opening that was <25 mm.[6] It had been shown that the main aim of conducting the surgery in these patients was to adequately restore the mouth opening and the associated functional outcomes related to speech, articulation and mastication.[7] Conducting these surgical approaches also served as a surveillance step that might be critical in intervening against early-stage cancers.[7] Accordingly, in the present section, we aimed to provide a thorough discussion about the importance and techniques of conducting surgical approaches to manage oral submucosal fibrosis.

Using intra-positional grafts or flaps had been previously demonstrated to be the commonest surgical approach that had been used to manage cases with oral submucosal fibrosis. Different studies in the literature have described and validated the efficacy of these approaches and it had been demonstrated that distant and local flaps can be used in these events. To obtain local flaps, it had been demonstrated that the donor site was located in the head and neck location and pedicle attachments were usually used to transpose these flaps to the oral cavity. These included palatal island flaps and tongue flaps, which were also called intraoral flaps. Other local flaps might also include extra-oral flaps. These included nasolabial flaps, buccal fat pads and temporalis fascia flaps. On the other hand, to obtain distant flaps, it had been demonstrated that the donor site was located distally in the thigh or arm of the affected patient with an associated arteriovenous anastomosis.

Using tongue flaps had been previously validated by many investigations in the literature. For instance, a previous investigation by Bhrany et al which included 25 patients that were indicated to have tongue flaps, concluded that the obtained outcomes were satisfactory.[8] Another investigation by Tepan et al also reported that 25 of their 100 population were indicated to have tongue flaps.[9] The authors also reported that the obtained results were good. However, it should be noted that these patients were followed up for a single month only. On the other hand, a long follow up investigation for seven years was conducted by Mehrotra et al that included 60 patients with oral submucosal fibrosis that were indicated to have tongue flaps for stabilization of the inter-positional flaps.[10] The reported results were also favorable indicating the efficacy of these flaps. However, it should be noted that the process might be associated with short-term effects on speech and mastication and potentially affecting the quality of life of the affected patients through oral fibrosis of the used flap on a long term basis. Therefore, a potential affliction of the donor area might be the only contraindicating factor against the use of tongue flaps in these settings. However, it should be noted that evidence regarding this information was not sufficient in the literature and no histological evaluation was previously conducted to rule out the prognosis of such events. In another context, palatal island flaps were described in the investigation by Golhar et al that reported the effectiveness of these types of flaps, which was carried out in 33 out of 100 patients in their investigation.[11] Besides, the authors reported that adjunct coronoidectomies and temporalis myotomies were used with the palatal flaps. Flap failure and torsion might occur secondary to the overextension of the flap. Besides, it might be challenging to reach these flaps, which might limit their use within the surgical settings. Furthermore, the maintenance of oral cavity opening was also reported after the buccal fat pad was administered among various studies in the literature.[7,11,12]

Using the nasolabial flap had also been previously demonstrated as a common approach in this setting (Figure 1). The wide use of the nasolabial flaps has been attributed to many reasons. These included the easy accessibility to the flap and the potentiality to use this type of flap to cover any region within the oral cavity based on the availability of the sound vascular pedicles as

obtained from healthy tissue and well-nourished area by the inferior nasal vasculature.[7,13-15] It had been furtherly demonstrated that the flap did not involve within the condition of the underlying disease and therefore, these reasons attributed to the wide advantageous use of the flaps. Intraoral hair growth and development scars were the main complications that might be associated with these types of techniques. Another investigation also warned against the risk of developing squamous cell carcinoma following conducting nasolabial flaps.[16] However, this was not supported by adequate evidence and further investigations were still needed. Using temporalis fascia flap to manage oral submucosal fibrosis was reported by a single investigation in the literature. The case series by Janjua et al validated the efficacy of the modality in five included patients.[17] In another context and due to the recent surgical advances regarding the successful construction of microvascular anastomosis, using distal flaps has been adopted by various investigations in the management of oral submucosal fibrosis. However, it had been demonstrated that such approaches required high levels of experience, increased operational costs and anastomosis failure might be associated. Furthermore, it appeared that this approach had been adopted by studies in China only with no evidence on patients from other countries globally. Besides, it had been demonstrated that debulking processes might be needed in some patients secondary to stenotic complications and squamous cell carcinoma might also develop as a very rare event.[18] To furtherly validate the use of this approach, further investigations were still needed from the different global healthcare surgical settings to study the efficacy and safety before being widely adopted.

Figure 1: Surgical appraoches aiming to achieve (A) nasolabial flap; (B) extended nasolabial flap; (C) intra-oral insertion extended nasolabial flap.[4]

It had been furtherly reported that scalpel was commonly used to achieve primary excision. Nevertheless, no adequate evidence was provided in the current literature regarding band excision, in addition to the direction and extent of the excision. In the soft palate, circumferential bands were more common in the tongue, diffuse fibrosis without the presence of delineated bands was more common, while in the buccal mucosa, evidence indicated that vertical bands were the commonest.[19] Previous studies have also demonstrated the use of laser for surgical primary excision.[20,21] Among these studies, different types of lasers were used including KTP 532, ErYCCG and diode lasers.[20-25] Nonetheless, it should be noted that favoring the use of lasers was not based on scientific evidence and was usually used based on their availability in surgical settings. Besides, the use of these modalities was also reported within limited areas and investigations regarding their oral uses were not encouraging. On the other hand, it should be noted that surgical excision with lasers was not associated with other adjuvant modalities, except for postoperative physiotherapy. Besides, it had been demonstrated that the efficacy of these modalities might be excellent and only 6 months of follow up were recommended for patients post-operatively. In the current literature, we did not find evidence regarding whether either scalpel or laser excisions were superior to one another. Following a successful excision of the underlying fibrous band, evidence regarding the administration of postoperative adjuvant therapy was contradicting about deciding the most appropriate and efficacious treatment modality. Using intra-positional grafts that were usually based on distant free flaps or local pedicle flaps was recommended by some investigations, while others suggested conducting muscle myotomy only or coronoidectomy/coronoidotomy as adjuvant surgical approaches.[25] Using split-thickness grafts, artificial dermis or collagen membranes to cover the excised areas was also reported among studies in the literature as a third alternative option. Many procedures have been described in the literature as adjunct approaches with the process of primary excision. The most common approaches included coronoidectomy, which had been defined as deliberate sectioning of the coronoid process, irrespective of muscle detachment and coronoiodotomy, which had been defined as detaching the coronoid process from its attachment in the temporalis muscle. Using these approaches had been explained to release the pulling of the temporalis muscles whenever oral excursion was done. This had been indicated in a previous investigation by Change et al which included 18 patients with head and neck cancers that were indicated for coronoidectomy secondary to trismus that had developed from radiation therapy.[7] The authors reported that an increase in the oral opening was significantly noticed at the half and one year of follow up following the procedure. It should be noted that it was

also reported that physical therapy was done for three months amid the surgical intervention neither tumor excision nor tumor location had a notable impact on the outcomes of the included patients.

Using artificial dermis and collagen membrane, split skin grafts and amnion and human placenta have been reported to be the most common grafts that can be used in the surgical settings of managing oral submucosal fibrosis to graft muco-muscular defects.[7,17,26] Using these grafts had been demonstrated to be for protective and supportive purposes to complete the healing process following the surgical intervention. In addition to all of the aforementioned approaches, further evidence indicated the efficacy of using prosthetic devices to adequately maintain the postoperative oral opening.[27,28] Intermediary oral stents were used as effective prosthetic rehabilitation devices in these settings.[13,29,30] After the fibrosed bands have been exiced, the use of these stents can adequately guide the healing process of tissues postoperatively and had been reported as valuable adjunct devices among the different studies. In this context, a previous case report by Celik et al also described a novel device that had been used as a graft shortly after the surgical procedure to stabilize the clips.[31] It should be noted that post-operative physiotherapy should be conducted to enhance the prognosis and maintain favorable outcomes. Conducting exercises related to mouth opening was an essential step to maintain adequate postoperative mouth opening and reduce the rate of post-operative trismus recurrence.[1,32] The process was usually inaugurated 3 days after the surgical intervention had been successfully achieved and patient compliance was an essential step to maintain the success of this step.

CONCLUSION

Different surgical approaches aim to remove the fibrous bands in the oral cavity and maintain adequate mouth opening. It should be noted that it would be hard to write a solid conclusion in this concern because most of the current evidence is either lacking or obtained from a limited number of studies with no proper sample sizes or adequate follow-up durations. Accordingly, the indication of the surgical intervention should be primarily done by the surgeon based on the degree of involvement of the oral cavity. Finally, we recommended that further comparative investigations be carried out to further demonstrate the most appropriate management modality and to rule out whether pharmacological or surgical modalities are more efficacious in these settings.

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