

Trismus Secondary Release Surgery and Microsurgical Free Flap Reconstruction After Surgical Treatment of Head and Neck Cancer

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KEYWORDS

- Trismus • Free flap reconstruction • Coronoideotomy • Radial forearm flap
- One donor site two anterolateral thigh flaps

KEY POINTS

- Trismus is a significant untoward outcome after head and neck cancer-ablation reconstruction, even by a free flap whether or not radiotherapy has been delivered.
- The only effective way to correct the unfavorable course of trismus is adequate release and reconstruction with another free flap. Achieving durable results after trismus release and free flap reconstruction necessitates proper patient selection, patients compliance, and vigorous rehabilitation.

INTRODUCTION

Trismus is not uncommon after head and neck cancer ablation and reconstruction.^{1,2} The combined effect of resection surgery that is destructive in its nature, radiotherapy, and preexisting limited mouth opening contributes to trismus.^{3,4} In such a case, trismus can be considered as a disease entity that may benefit from secondary surgical release and reconstruction. Alternatively, trismus could be a sign of a serious illness such as osteoradionecrosis or secondary/recurrent tumor, and if that the case, surgery should target the underlying condition and may result in possible improvement of trismus.^{5,6}

Trismus compromises patient quality of life due to its adverse effects on chewing, swallowing, articulation, and oral hygiene.⁷ It also limits tumor

surveillance, which could delay appropriate intervention.^{8,9} Therefore, a surgical effort towards adequate release and proper reconstruction when indicated can have a significant positive impact on patient's satisfaction and facilitates tumor control.¹⁰

Favorable outcomes and long-standing results after trismus release surgery and reconstruction, however, are built on proper patient selection, meticulous but adequate multistructure release, and proper reconstruction techniques that can address additional patient's goals such as improved oral function, enhanced facial appearance and cosmesis, and dental rehabilitation.^{4,10}

Herein, this article will focus on the conditions and factors essential for fulfilling the goals of trismus release and reconstruction surgeries and their possible pitfalls and their avoidance.

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PATIENT SELECTION AND PITFALLS

The importance of selection of the right candidate for release surgery and free flap reconstruction cannot be overemphasized. Motivated and compliant patients noted during postablation reconstruction follow-up are ideal.

Mouth opening and trismus history should be well documented, as they may help identify patients at risk of malignancy if trismus is sudden or to determine the benefits of surgery if trismus was an old finding before the initial resection-reconstruction.

Tempomandibular joints (TMJ) and cheek pliability are also carefully examined.

In preparation for surgery, panoramic pictures, pneumatic computed tomography (CT), and standard cancer survey are performed to rule out malignancy and provide means to assess functional gain.^{4,11}

Pitfalls may occur including selection of those who may not benefit from the surgery at all, such as patients with TMJ and patients with extensive history of cancer resection, reconstruction, and postoperative radiotherapy.

Patients with TMJ ankylosis may increasingly experience relapse of ankylosis and gain no or limited mouth opening even after surgery. The authors largely have avoided those patients; however, in some selected cases, TMJ ankylosis could be addressed first, and then after achieving stable results, release surgery can follow.

SURGICAL RELEASE OF TRISMUS AND ITS PITFALLS

Trismus release can be achieved by variety of techniques.^{12,13} Scar release followed by masticatory muscles myotomy and combined with coronoidotomy/coronoidectomy to diminish the locking effect of temporalis muscle fibers can yield good and lasting results.¹⁴ This extensive, multistrucre release requires a complete understanding of the multifactorial nature of trismus^{3,4} to achieve the goals.

Although wound healing and contracture are individual, unpredictable, and inevitable, patient's compliance with rehabilitation may also count greatly for the ultimate result, and it could result in 50% loss of intraoperative gain in mouth opening on long term follow-up. However, in the authors' practice, repeated release surgery has never been indicated, suggesting that the long-term gain in mouth opening is enough and acceptable for the patients.

In contrast to inadequacy is excessive release surgery, resulting in bilateral tempomandibular

joint dislocation. Avoidance demands unforceful release and to set the goal of mouth opening to not to exceed 40 to 45 mm. The release procedures should be individualized but always start from simple scar resection, all the way up to combined multistrucre release including coronoidotomy based on intraoperative mouth opening gain after each step of release.

RECONSTRUCTION TECHNIQUES AND THEIR PITFALLS

After adequate release, optimal reconstruction is necessary to achieve long lasting gain in mouth opening.^{4,10} Free flap is the method of choice, because it allows primary wound healing with minimal destruction to local/regional tissue, minimizing postoperative inflammation and contracture.

Proper free flap selection and inset are essential for uncomplicated reconstruction and maintenance of good results.

The Donor Site of Choice

In free flap selection, bulk and rigidity should be considered first. Bulky flaps will necessitate revision surgery, as they endanger self-chewing, resulting in prolonged inflammation, leading to tissue contracture and regression of the initially gained mouth opening. Therefore, they are better to be avoided.

In the search for the optimal thickness of the flap with minimal donor site morbidity to reconstruct the release defect, the authors' experience has focused on 2 donor sites, the radial forearm and the anterolateral thigh. This choice evolved from using

- Bilateral radial forearm flaps, to 1 longer radial forearm flap to avoid bilateral loss of the radial artery

- To two radial forearm flaps from the same donor site to avoid using the lip-gingival sulcus as a tunnel for 1 longer radial forearm flap damaging lower lip function

- To bilateral anterolateral thigh flaps to allow simultaneous harvest and release

- To 2 anterolateral thigh flaps from the same donor site as experience and familiarity with the anatomy improved

- Into finally bilateral radial forearm flaps given negligible morbidity after sacrificing the radial artery based on experience with more than 1000 forearm flaps and reliability of anatomy compared with 2 radial forearm flaps from one side

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