The Triangle of Unfavorable Outcomes After Microsurgical Head and Neck Reconstruction

Planning, Design, and Execution

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KEYWORDS

• Head and neck reconstruction • Microsurgical reconstruction • Quality of life • Unfavorable results • Failure

KEY POINTS

- Unfavorable microsurgical reconstruction, independent from free flap failure, is an important concept; understanding and avoidance of the unfavorable outcome enhances patient's quality of life.
- Unfavorable microsurgical reconstruction is the result of defective planning and decision making, inapt design, and faulty execution in a triangular interrelationship.
- Inexperience, inadequate discussion, vague goals, ineffective communication, and lack of sincere reflection on untoward outcomes pave the roads for adversities in reconstruction.

INTRODUCTION

For a long time, the outcomes of microsurgical head and neck reconstruction have been reported in the form of free flap survival rate, disease-free survival rate, and 5-year survival rate, reflecting what mattered at the time: achieving reliability of the techniques used in ablation and reconstruction surgeries. But, reliability of microsurgical techniques nowadays along with improved survival rates after advanced head and neck tumor ablation and the rising need for additional surgeries to treat reconstruction sequelae to improve function or appearance[1–5] have brought about the importance of considering a patient's quality of life.[6,7]

Thinking of a patient's quality of life leads to defining success and failure of reconstruction differently. Success refers not only to survival of a flap but also to adequately restoring function and appearance to ensure good patient living after surgery as expected. Failure refers to inadequately achieving that goal despite flap survival. Failure can be marked by prolonged hospitalization, readmissions, or secondary surgeries, to achieve what has been failed to gain the first time.

Herein, avoidance of failure in achieving the reconstructive goals that a viable flap should serve is of paramount importance to the core theme of contemporary microsurgical head and neck reconstruction.

An unfavorable result can arise from an error in any of the 3 major phases of the reconstructive microsurgery. Defective planning and decision making is 1 faulty scenario. Inapt design and

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erroneous reconstruction are other possibilities. However, an unfavorable result is the bitter fruit of failing to a variable degree in all of these 3 aspects, suggesting an independent yet closely related interactive triangle in which every corner/angle can lead to unfavorable outcome alone or by contributing to a collective effect of the triangle (**Fig. 1**).

There are still many variables, however, in head and neck reconstruction that cannot be controlled, or predicted, such as spontaneous and radiation-induced tissue atrophy, fibrosis plate exposure, wound contracture, and possible osteoradionecrosis.[8,9] Striving to bestow the best quality of life possible on patients imposes a responsibility to always explore the underlying causes behind an unfavorable result and to take into consideration the variables (discussed previously) to pioneer a technique and/or refine another to minimize the negative impact of those variables on the quality of reconstruction and enhance the outcome.

THE TRIANGLE OF UNFAVORABLE OUTCOMES

Defective Planning and Decision Making

Definition

Defective planning and decision making refers to an error in the reconstructive approach, such as 1-stage versus staged and optimal versus suboptimal, or the extent of the reconstructive endeavor, for instance, to address the defect only versus the defect and the underlying conditions, such as trismus, fibrosis, and so forth. It also refers to error in the selection of the flap, perforator/skin vessel, and recipient vessels.

After deciding on a microsurgical reconstruction, the planning should address the following.

Should it be a 1-stage total reconstruction or staged reconstruction?

This is a key question addressing, for example, mandibular and maxillary defects.

The right answer should take into account prognosis, anticipated defect characteristics, realistic patient's goals, and expected postoperative course. Based on these, the answer or the plan can be thorough and governs flap selection, bony versus soft tissue flap, and the number of flaps needed as well as the demand for subsequent touch-up procedures, such as sensory restoration after inferior alveolar nerve resection, immediate or delayed dental rehabilitation in mandibular reconstruction, and so forth.[10]

What are the priority goals of reconstruction, and how can he chosen flap(s) be used to fulfill these goals?

Head and neck defects can be extensive, spanning multiple subsites, or involve sophisticated structures, such as the tongue, the lips, the eye, and so forth. Autologous tissue is limited and in many occasions cannot replace the lost delicate structures, especially at the same time. Prioritizing the reconstruction, therefore, is essential to fulfill a patient's goal and minimize dissatisfaction or complications.

Planning is also concerned with achieving and maintaining good results, for example, how to achieve good occlusion and trismus-free reconstruction, prevent tissue sagging, and so forth. Also, surgeons should remind themselves in planning with the important need for certain surgical procedures not related to free flap surgery itself, such as preplating, intraoperative navigation, coronoidotomy, suspension, and so forth, to allow enough time for preparation and effective utilization in the surgery.

Last but not least, planning should address free tissue donor sites. Although many flaps can do the work, only few have the advantages of 2-team approach and versatile design, especially after previous microsurgical reconstructions. Taking versatility, ergonomics and logistics, and donor site morbidity into account, flaps from lower extremity, in particular, the anterolateral thigh (ALT) flap and the fibula osteoseptocutaneous flap, have taken over head and neck reconstruction, signaling a decline in using other donor sites.[11–13]

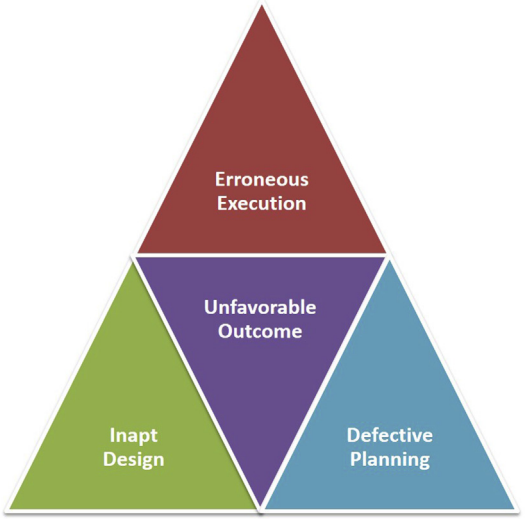

Fig. 1. The triangle of unfavorable outcome.