OPEN

PRS GLOBAL OPEN

VIEWPOINT

Reconstructive

A Stepwise Approach to the "Frozen Neck" for Secondary Microsurgical Reconstruction

Maria Chicco, MBBS, MRCS*; Tony Chieh-Ting Huang, MD, MSc†; Min-Min Lee, PhD‡; Hsu-Tang Cheng, MD‡§¶

Secondary head and neck microsurgical reconstruction for patients with prior neck dissection and irradiation is surgically challenging.[1] We present our stepwise approach to the "frozen neck," which may assist microsurgeons in successfully completing secondary head and neck microsurgical reconstruction.

A 54-year-old male patient with right tongue cancer underwent tumor resection, neck dissection, free flap reconstruction, and postoperative irradiation 2 years previously. In the follow-up period, the patient developed a recurrent floor of the mouth cancer. The otolaryngologists performed recurrent tumor resection with segmental mandibulectomy, resulting in a large through-and-through floor of the mouth defect (Fig. 1). The reconstructive procedure was divided into the following five steps:

STEP 1. NECK DISSECTION AND SCAR RELEASE

An incision is made toward the mid-clavicle, perpendicular to the incision made by the otolaryngologists (Fig. 1). Extensive neck scar release is meticulously performed using blunt-tip dissecting scissors. An adequately sized neck pocket is prepared as an inset for the free flap as well as a backup space in case that free tissue transfer fails and a pedicled pectoralis major flap is required. Considerable care is taken during preparation of the neck pocket, in particular when dissecting along the course of the carotid artery and jugular veins.

Fig. 1. Resection of the recurrent tumor and fistula resulted in a large through-and-through floor of the mouth defect. An incision is made toward the mid-clavicle, perpendicular to the incision made by the otolaryngologists.

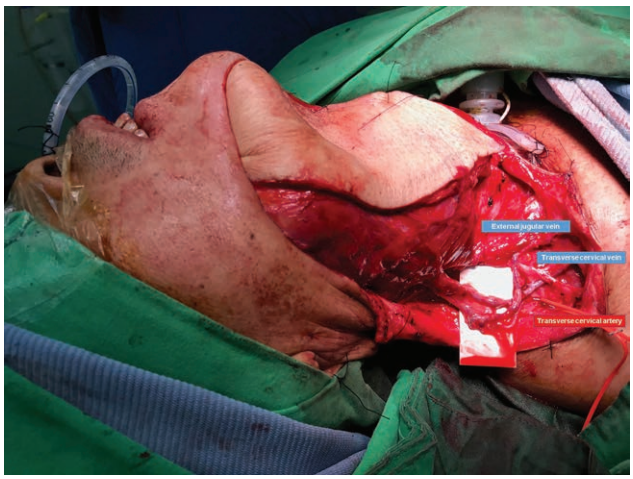

Fig. 2. An ALT flap sized 26 × 8 cm is prepared with a long vascular pedicle and is anastomosed to the ipsilateral transverse cervical vessels.

STEP 2. PREPARATION OF RECIPIENT VESSELS

The omohyoid muscle is identified immediately above the clavicle and lateral to the sternocleidomastoid muscle. The external jugular vein, if encountered, is carefully prepared. The loose fatty tissue cephalad to

Related Digital Media are available in the full-text version of the article on www.PRSGlobalOpen.com.

*From the *Department of Plastic and Reconstructive Surgery, Wexham Park Hospital, Frimley Health NHS Foundation Trust, Slough, UK; †Division of Plastic and Reconstructive Surgery, Mayo Clinic, Rochester, Minn.; ‡Department of Food Nutrition and Health Biotechnology, Asia University, Taichung, Taiwan; §Division of Plastic and Reconstructive Surgery, Department of Surgery, Asia University Hospital, Asia University College of Medical and Health Science, Taichung, Taiwan; and ¶Big Data Center, China Medical University Hospital, Taichung, Taiwan.*

Received for publication August 6, 2021; accepted August 10, 2021.

Plast Reconstr Surg Glob Open 2021;9:e3841; doi: 10.1097/GOX.0000000000003841; Published online 4 October 2021.

the omohyoid muscle is carefully explored through blunt dissection. The transverse cervical vein is usually found within the fatty tissue lateral to the sternocleidomastoid muscle. The transverse cervical artery (TCA) is located deep and, in most cases, slightly cephalad to the vein. (**See figure 1, Supplemental Digital Content 1,** which displays extensive neck scar release being performed. An adequately sized neck pocket is prepared as an inset for the free flap, as well as a backup space. The transverse cervical artery and vein are found at the root of the neck lateral to the sternocleidomastoid muscle. **http://links.lww.com/PRSGO/B795.**) A handheld Doppler ultrasound probe is used to locate the TCA. The TCA is traced proximally so as to obtain a larger vessel diameter.[2] Before harvesting the free flap, the distance between the head and neck defect and the TCA and recipient veins is measured to avoid using a vein graft.

STEP 3. THE "PLAN B"

There is always a "plan B" for the "frozen neck." If possible, both the transverse cervical vein and the external jugular vein should be explored and prepared and two vein anastomoses performed[3] (Fig. 2). The pedicled pectoralis major flap is the main backup flap.

STEP 4. PREPARATION OF THE ANTEROLATERAL THIGH FLAP

The anterolateral thigh (ALT) flap is the preferred flap for secondary microsurgical reconstruction of head and neck defects. The ALT flap is harvested with a large size, long axis (26 × 8 cm) and adequate vascular pedicle length to reach the recipient vessels without tension (Fig. 2).

STEP 5. MICROVASCULAR ANASTOMOSIS

Vascular anastomosis is performed with interrupted 9-0 nylon sutures under the microscope. The neck wound is closed primarily without tension. (**See figure 2, Supplemental Digital Content 2,** which displays the neck wound closed primarily without tension. **http://links.lww.com/PRSGO/B796.**)

CONCLUSION

Our stepwise approach to the "frozen neck," combining use of the free ALT flap and transverse cervical recipient vessels, may assist microsurgeons in successfully completing secondary head and neck microsurgical reconstruction.

Hsu-Tang Cheng, MD
Division of Plastic and Reconstructive Surgery
Department of Surgery, Asia University Hospital
Asia University College of Medical and Health Science
Taichung, Taiwan, No. 222, Fuxin Rd,
Wufeng Dist., Taichung City 41354
Taiwan
E-mail: hsutangcheng@gmail.com

DISCLOSURE

The authors have no financial interest to disclose in relation to the content of this article. This study was supported in part by Asia University Hospital Research Program (AUH-10951018) and Taiwan Ministry of Science and Technology Research Grant (MOST 110-2221-E-468-005).

REFERENCES

1. Al Deek NF, Wei FC. The osteosarcoradionecrosis as an unfavorable result following head and neck tumor ablation and microsurgical reconstruction. *Clin Plast Surg.* 2016;43:753–759.
2. Lin KW, Huang TC, Cheng HT. Utilization of anterolateral thigh flap and transverse cervical recipient vessels for head and neck cancer patients with former neck dissection and irradiation: a case series study. *Ann Plast Surg.* 2019;82:415–419.
3. Lee YC, Chen WC, Chen SH, et al. One versus two venous anastomoses in anterolateral thigh flap reconstruction after oral cancer ablation. *Plast Reconstr Surg.* 2016;138:481–489.