Tissue Expanders of the Head and Neck: A Case Series

Colten P. Wolf MD, Amy Pittman MD
Loyola University Medical Center Department of Otolaryngology, Maywood, IL

Introduction

Reconstruction of large defects of the head and neck can be accomplished with many different mechanisms. Skin grafts, local flaps, or free tissue transfer are common reconstructive methods and the defects size, location, and shape can all influence decision making on what type of reconstruction is planned. The procedure generally consists of a two staged approach. The first stage involves implantation of the expander (a silicone balloon with a port to inject saline). The patient is then followed in the outpatient setting for a period of time coming back during scheduled intervals to have the expander filled with saline to expand the overlying skin. The patient is then taken back to the operating room for the second stage of the procedure to have the expander removed and the reconstruction completed.

Tissue expanders offer many advantages such as improved cosmetic match of skin color and texture, minimal donor site morbidity, and ability to preserve hair bearing skin. There are downsides to tissue expansion including the two-staged nature of these procedures, and the temporary discomfort and disfigurement patients go through while the expander is in place.

Methods and Materials

A retrospective chart review was performed on patients who received tissue expanders of the head and neck between two institutions between 2014-2022. Medical records were reviewed for patient demographic variables such as age, sex, ethnicity, medical comorbidities were collected. In addition, we looked at specific features of their tissue expander including number of fills, type and shape of expander, reconstructive outcome following expansion, and complications.

Results

A total of 11 patients were included in this series of patients and the ages ranged from 2 years old to 78. Demographic information is listed in Figure 1.

Most of the patients in this study underwent reconstruction due to prior cutaneous malignancy, followed by trauma, and 1 patient having a keloid scar (Figure 2). 10 of the patients had defects of the scalp, and one had a large neck defect from a keloid scar. The outcomes reviewed for this patient group looked at complications and closure of the defect. The two complications following surgery seen in this group of patients included early extrusion of the expander. One patient required re-implantation of the expander, while the other had early removal of the expander and subsequent second stage reconstruction. One patient had partial closure of the wound following second stage reconstruction, while the other 10 patients had complete closure.

Figure 1: Demographic Information

		Patients (N)
Age (Mean)	45 (Range 2-78)	11
Gender	Male	5
	Female	6
Race/Ethnicity	White	10
	Black	1
Obesity	BMI >30	7
	BMI 30-<40	3
	BMI >40	1
Comorbidities	DM (type2)	1
	HTN	4
	Asthma	4
	Immunocompromised	1
Smoking Status	Never	10
	Former	1
Cancer Treatment History	Radiation	2
	Chemo/RT	1

Figure 2. Defect & Reconstruction Characteristics

		Patients (N)
Indication for Reconstruction	Cancer	7
	Trauma	3
	Keloid Scar	1
Defect Location and Size	Scalp Medium (4-6cm)	3
	Scalp Large (>6cm)	7
	Neck	1
Defect Depth (scalp)	Skin/Pericranium	6
	Skin Only	4
Number of Expanders	One	9
	Two	2
Fill Volume, Mean (SD)	15.41 SD 6.03	
Total # of Fills, Mean (SD)	7.4 SD 1.87	
Complications	Yes	2
	No	9
Closure Success	Complete	10
	Partial	1

Lessons Learned

Image 1: Two expanders are often better than one. This is the case of a seven year old boy with a significant degloving injury of the scalp following a dog bite. Tissue expansion was planned and a large right posterior tissue expander and a smaller left lateral tissue expander were used generate 2 large local flaps for scalp closure.

Image 2. Limited reconstruction of the initial defect can help later reconstruction. This is the case of 32 year old female with a large cutaneous malignancy that was excised with subsequent placement of Integra. She ultimately underwent placement of 2 tissue expanders and subsequent closure of the defect.

Image 3: It is important to be mindful of underlying structures. The first image shows a 2 year-old patients who had bony remodeling with the expander in place. The patient on the right had an expander placed in his right neck to cover a keloid scar, which can produce pressure on the carotid bulb over the course of expansion.

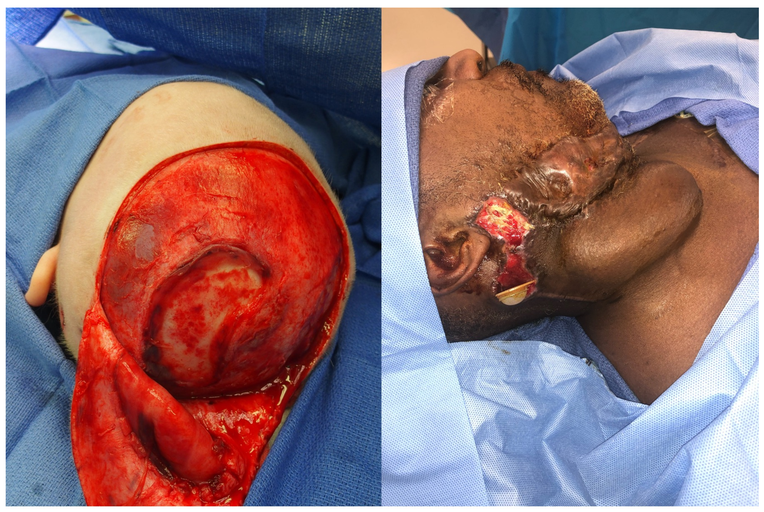

Image 4: Lower profile ports can limit extrusion. The below image shows 2 yo with a large posterior scalp defect with exposed calvarium after a car accident where the patient was dragged along pavement. The image on the top right shows early extrusion of his port site.

Conclusions

Tissue expanders offer many advantages over other reconstruction methods including near perfect cosmetic match of tissue and minimal donor site morbidity. The use of tissue expansion in head and neck reconstruction is a safe options for patients to achieve good outcomes for large defects of the head and neck.

Contact

Colten Wolf
Loyola University Medical Center Maywood IL
coltenpwolf@gmail.com

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