

## Facial Reconstruction of Burn Patients with Tissue Expanders in Comparison to Skin Grafting

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### Abstract:

**Objective:** The ability to increase local tissue expansion has led to its rapid use in plastic surgery. This study was conducted in a tertiary care hospital, Lahore from June 2008 till June 2010, over a period of 3 years. A total of 20 patients of age 17-30 years with burn on face and neck area were selected after informed consent. 45 expanders were introduced on face and neck. All patients had 7 to 10 days post operative intravenous antibiotics on out door basis. Expander inflation was started after 8 to 10 days when the surgical scar had healed. Periodic inflation of the balloon expander was carried out twice weekly for a period of 6-8week,at the end of which the tissue expander was removed and reconstruction of face done. All surgeries were done under general anaesthesia and standardized photographs were taken before and after surgery.Indications for tissue expansion were, flame burn in 13 patients and acid burn in 7patients.

**Results:** Out of 20 patients 15 (75% ) were females and 5(25% ) were males. 16 (80%) patients already had skin grafting done at another institution. Most common complication was infection 4%, for which expander had to be removed .There was no case of early expander exposure(first 3 to 4 weeks) and failure of expander mechanism or deflation.

**Conclusion:** Tissue expansion is a safe and good technique with results far superior to skin grafting, especially on face with maximum color and texture match to the local skin.

**Key Words:** Tissue Expanders: Skin Grafting

### Introduction

Tissue expansion has become a routine procedure in plastic surgery.<sup>1</sup> Neumann in 1965 was the first one to recognize the potential of tissue expansion in reconstructive surgery.<sup>1</sup> Radovan used tissue expanders for breast reconstruction after mastectomy<sup>1</sup>. Subsequently tissue expansion has become the treatment method of choice for many congenital and acquired defects in children

and adults.<sup>2,3</sup> Expanders are silicone envelopes that have self sealing injection ports through which saline is injected progressively through the port at twice weekly intervals which enlarges the expander.<sup>1</sup>

At the cellular level the epidermis undergoes mitotic changes in the expanded skin and there is recruitment of adjacent tissue.<sup>1</sup> The dermis thins but there is a thick fibrous tissue that focuses around the capsule.<sup>4,11</sup>

Skin expansion allows the surgeon to generate additional precious tissue.<sup>2,5</sup> This enables the surgeon to cover defects using local skin of appropriate color ,texture and adnexal structure, especially the face where we want near perfect match.<sup>12</sup> Distant donor

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site complication can be avoided.<sup>1</sup> Sensate and hair bearing skin can be expanded and used for specialized areas of facial reconstruction like eyebrows.<sup>6,18.</sup>

Asian faces tend to scar badly after burn injury.<sup>16</sup> Flame and chemical burn to face are practically challenging without satisfactory results with traditional techniques.<sup>12,16</sup>

**Results**

The age group were from 10 -30 years  
 15 were females  
 5 were males

Table 1: Indication for tissue expansion

Indications	Number
Flame burn	13
Acid burn	7
Previous surgery with skin grafting	16

Table 2: Anatomic site

Face	16
Neck	4

Table 3: Complications of Expanders

Complications	Frequency
Infection	6%
Expander exposure after 4 weeks	2%

While complication like infection, implant exposure, deflation, hematoma and seroma may occur and alters the timing of reconstruction , barely compromise the results<sup>2,3.</sup>

**Discussion**

The ability to increase local tissue by controlled soft tissue expansion has led to a rapid increase in the use of tissue expanders in plastic surgery<sup>2</sup>.

As a well established principle in facial reconstruction surgery, one should use local

tissue wherever possible to provide the best tissue for color and texture match and sensation maintenance<sup>12,1.</sup>

The lack of mismatch soft tissue is a common challenge facing the reconstructive surgeries especially when it comes to facial reconstruction.<sup>12,15</sup>

Tissue expansion in facial reconstruction provides skin with near perfect match in color and texture as well as sensation.<sup>1,13</sup>

With tissue expansion there is no new unduly disfiguring defects and there is avoidance of distant flaps as well.<sup>1</sup> Whereas skin grafting may suffers from mismatch of color, skin thickness and lack of proper contour in relation to neighboring tissue.<sup>12</sup> also the skin grafting causes scar contracture leading to disfiguring of important structure such as eyelids and corners of mouth.<sup>17</sup>

Even with its disadvantages like temporary cosmetic deformity during expansion phase ,prolonged periods of expansion, and the need for multiple procedure, the results of tissue expansion are superior to the traditional methods as in skin grafting.<sup>2,9</sup> With proper control of infection with intravenous antibiotics and increased operative experience, the major complication such as infection and early expander exposure are reduced to the minimum.<sup>1,2,7</sup>

**Conclusion.**

Tissue expansion is a safe and good technique with results far superior to skin grafting, especially on face .with maximum color and texture match to the local skin.<sup>1,2,8,9,11,12.</sup>

Complication did not compromise the final out come as they occurred near the end of tissue expansion period<sup>3,13</sup>.

The overall decrease in complication is likely the result of increased operative experience and the use of antibiotics.<sup>7</sup>

In comparison with skin grafting with mismatch of color, texture, hematoma formation, failure and donor site complication.<sup>15,9</sup>



Fig. 1. (a) During Expansion



Fig. 1. (b) Post Operation



Fig. 2. (a) During Expansion



Fig. 2. (b) Post Operation

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