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Expansion in Head and Neck atSohag University Hospital

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Abstract

Background: Tissue expansion is widely used in the head and neck, it have many advantages as the expanded tissue have the same color and texture of the treated area of the skin.

Objectives: The aim of this work is to evaluate the expander utilization in head and neck reconstruction regarding indications and complications.**Patients and methods:** This is a prospective study included 30patients (18 female and 12 male), their age ranged from 3 to 36 years with mean value of 16 years,all patients were evaluated and managed in the plastic surgery department at Sohag university hospital. **Results:** the most cases of tissue expander used for scalp reconstruction followed by neck and nose reconstruction, young aged mostly treated with tissue expander than old aged and female more than male. **Conclusion:**The use of expanders provides the surgeon with a very reliable, simple method of reconstruction, the most common indications of expander uses were the post burn lesion alopecia of the scalp, post burn scar of the face, congenital melanocytic nevus of the forehead, haemangioma of the nose and congenital lymphatic malformations of the neck. The most common complications were expander exposure, wound dehiscent and serosa.

Keywords: Tissue expander; scalp;reconstruction.

Introduction

Tissue expansion started to be used by Neumann in 1957 for reconstruction of external ear following avulsion injury. Uses of tissue expanders in breast, soft tissue and burn reconstruction have been popularized by Radovan in 1980**[1].**Tissue expansion is used for alopecia, burn deformities (scar, contracture, poor primary skin graft area)**[2].**One of advantages of tissue expanders , donor site and recipient site have the same color, thickness and hair follicle, with minimal scarring and donor morbidity **[3].**Today, tissue expansion is used for treatment of scalp alopecia that affected 50% or more of scalp surface area**[4].**The expander is mainly silicone packet with a self-sealing injection port. The silicone envelope can be round, rectangular, tubular, croissant, or versatile in shape, while its size varies from 50cc up to more than 1,000 cc. The surface is smooth or textured. Some consider that the textured expander can be inflated more easily, and does not migrate. The self-sealing injection port may lie on top of the expander, or be connected with a longer tube, in which case the port needs a separate place, not too close to the expander. The expander stays in place from 10 days to 6 months**[4].**

Patients a

Patients and methods

The study is prospective on thirty patients (18 female and 12 male) with head and neck lesions, treated with tissue expand ers, the patients were treated at Plastic Surgery Department Sohag University Hospital from April 2015 to April 2017. The age of the patients ranged from 3 to 36 years with an average of 16 years.. A detailed history was taken for each patient

including patient's demographic characteristics, etiology, duration, location, size and configuration of the lesions, status of the remaining scalp or cheek and neck soft tissue, co-morbid conditions and medical or surgical treatments received by the patient. The outcomes and possible complications have been discussed with the patient. Written consent was signed by each patient except in children for whom the consent was signed by their responsible adult person. Multiple expanders were neededin some cases. All with remote valve system with different shapes (rectangular, rounded, and helical)Per-operative antibiotic with induction of general anesthesia for all patients. Expanders were placed through paralesional incisions under the normal scalp or normal skin 0.5 cm away from the lesion. A subgaleal pocket in scalp and subcutaneous pocket in cheek and neck slightly larger than the base of the expander was dissected. After expander placement, it was injected with normal saline 10-20% of its actual volume. After meticulous hemostasis, the wound was closed in two layers, galea sutured with 4/0 polyglactin, and the skin with simple interrupted suturing by 4/0 or 5/0 polypropylene. First post-operative expansion started two weeks later, with small gauge 25 needles under aseptic conditions and the amount of normal saline injected was guided by tissue response and patient tolerance. The frequency of expansions was twice weekly. When adequate expansion was achieved, the patient was re-admitted for reconstruction after last injection. The expander was removed through the original incision. The flap was next advanced or rotated to ensure adequacy of wound coverage.

Results:

1-Age: Age of the patients in our study ranged from 3 years – 35 years with the mean value of 16 years.

2- Sex distribution:

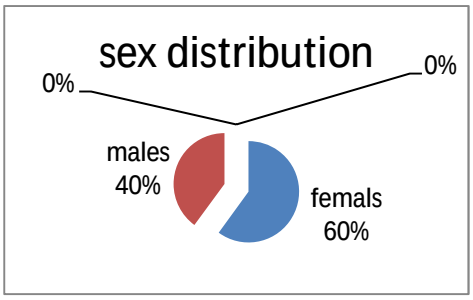

Fig. (1): sex distribution

3- Etiology:

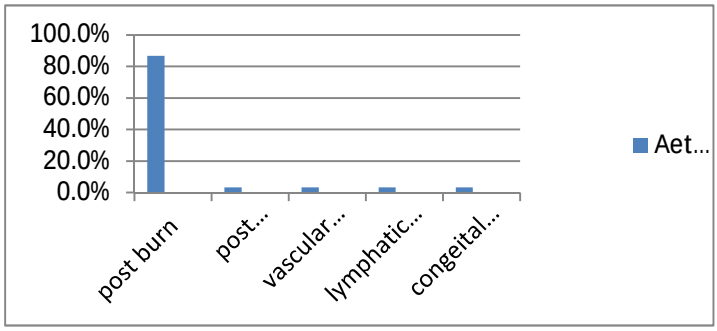

Fig.(2): etiology of lesions.

Etiology of post burn lesion:

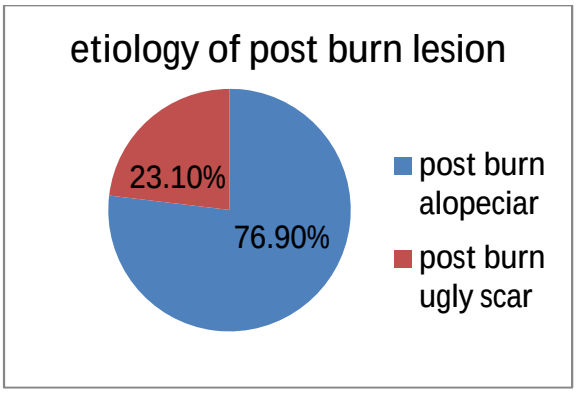

Fig.(3): etiology of post burn lesion

- Patient satisfaction:

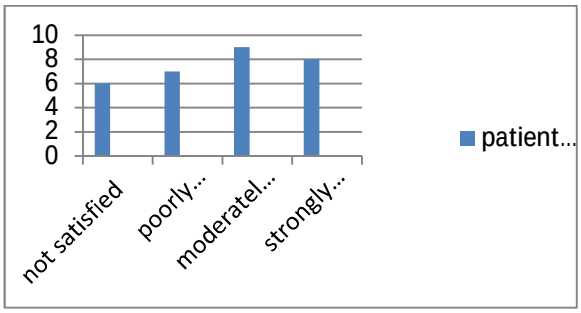

Fig.(4): Patient satisfaction

- Site of expander insertion:

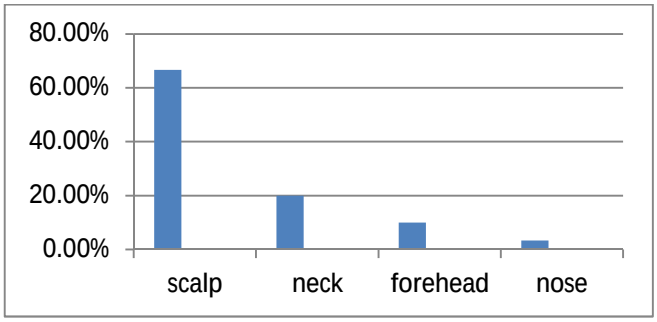

Fig.(5): site of expander's insertion

6-Type and number of expanders:

- Thirty one expanders were used on thirty patients.
- One patient used tow expanders.
- Rectangular types were used on 29 patients (96.6%).
- Elliptical expander was used on only one patient (3.4%).

7-Expander's capacities:

Table (1): expander capacities

capacities	150cc	250cc	350cc	500cc
rectangular	5	10	14	1
Elliptical			1	

8-Site of expander ports:

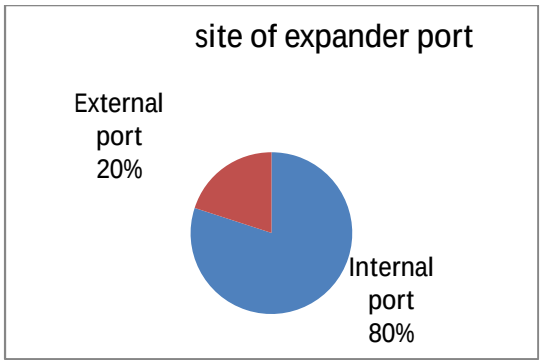

Fig.(6): site of expander ports

9-Duration of expansion:

ranged from 5days up to 55days,the main duration 35days**.**

10-Expander complications:

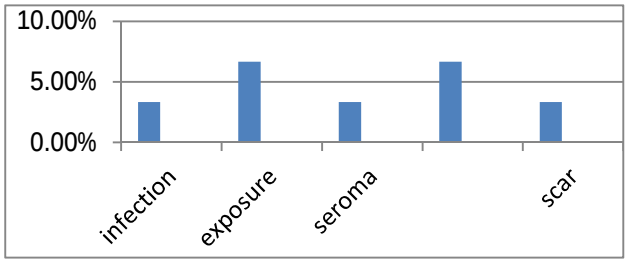

Fig.(7): expander complications

11-Management of complication:

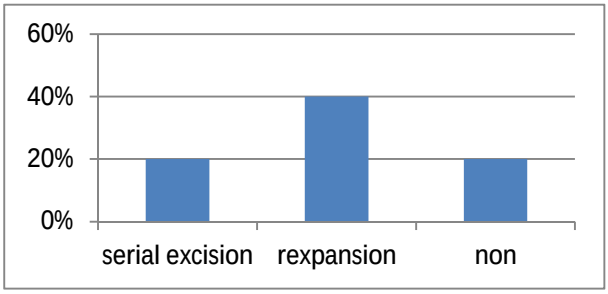

Fig.(8): management of complication.

Case presentation

Case 1:

Female patient 17 years old presented with post burn alopecia of scalp of rt parietal – expander insertion (350 cc, rectangular) and removed after complete expansion (1000cc).

(a)

(b)

Fig.(9):a&b pre and postoperative

Case number 2

Male patient 12ypost burn alopecia of scalp expander insertion (250cc, rectangular) and removed after expansion (750cc)

(a) **(b)**

Fig.(10): a&b pre and postoperative

Case number 3

Female patient 4ys post burn alopecia of occipital region of scalp expander insertion (250cc, rectangular) and removed after expansion (680cc)

(a) **(b)**

Fig.(11): a&b pre and postoperative

Discussion

Age has significant impact on the expansion outcome**.[6] .**In our study female patients were predominant(60%), similar to Almeida**[7]**

Burn scars often distort and restrict the mobile features of the face. Patients with facial disfigurement present a considerable challenge to the plastic surgeons. To achieve an adequate functional outcome and an improvement in appearance, a large amount of soft tissue is needed. Full thickness skin grafts and distant flaps are the usual method of coverage of facial defects. However, the desired results are usually not achieved because of differences in the transplanted tissue, and there is often considerable morbidity at the donor sites. The use of tissue expansion in reconstruction of head and neck, particularly about the scalp and face, has revolutionized treatment of these patients by allowing optimal aesthetic reconstruction by use of a similar adjacent tissue to reconstruct a defect without creation of a donor defect. Tissue expansion is the ideal procedure for reconstruction of scalp defects and is the only procedure that allows development of normal hair-bearing tissue to cover alopecia area**. [5]**.

In our study, the commonest use of tissue expander was for reconstructing post burn lesion alopecia (86.8**%)** either post burn alopecia (76.9%) of post burn lesion or post burn ugly scar of face and neck (23.1%), other indication post burn ugly scar of neck

one case, vascular malformation of nose one case congenital melanocytic nevus of forehead one case and lymphatic malformation of neck one case. The shape of the expander used depended primarily on the site of expansion and reconstruction needs. Standard shapes were rectangular, round and crescent. The expander had to be large enough to provide the expansive forces necessary to achieve the desired tissue augmentation. Before operating, the donor site for the tissue-expanded transposition flaps was determined by evaluating areas with unscarred, well-matched skin, close to the head and neck**[8]**.

In our study rectangular expanders were commonly used (96.6%) as rectangular expanders give an increase in surface area of 38% as opposed to round expanders of only 25% Hence, always use rectangular expanders-these "harvest" more tissues **[9].**

In our study rectangular expander 350cc were used on14 patient (45.1%) and 250cc on 10 patients (32.2%) not depended on size of expander but depended on base of expander that depended on size of defect.In our study, there is no significant difference in using tissue expander with external port compared with internal port in terms of symptom rate and patient's' satisfaction. In addition, the pain feeling in injection for external port is less than that for internal port Compared with other studies**[10].**However, there is a persistently high complication rate of tissue expansion despite continued experience**[11].**In our study there is no CT done, as it is not routine investigation and there are no cases complain manifestation of nerve compression. Hematoma is minimized by meticulous hemostasis and the use of suction drains. When clinical examination reveals the presence of a significant hematoma, immediate surgical drainage and irrigation of the implant cavity are indicated. Secondary consequences such as infection, excessive Tension on expanded tissues and capsule formation can be prevented by prompt and adequate treatment **[12].**In our study, Cellulitis was noted over the reservoir dome in one patient. Following treatment with intravenous antibiotics, local signs of inflammation resolved promptly and serial inflations were resumed. Forehead expansion resulted in no significant resorption of calvarial bone directly beneath the implant. The tissue expanders were all placed in a subgaleal pocket, leaving pericranium intact over the surface of the skull. Subsequent inflation to a volume of 300- 400 cc proceeded uneventfully over a period of 3 months. There is no an obvious depression in the frontal bone **[13]**.

In our study two cases of expander exposure one on scalp due to infestation with pediculosis and other on the neck due to insertion in unhealthy atrophic scar.

In our study four cases of complication needed expander removal tow expander exposure and tow wound dehiscence.Two cases underwent re expansion after three months.One case underwent serial excision.Other case not follows up as follow up twice weekly post-operative for injection, every two weeks in the first month and every month for next fiv**e** months.

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